

LEGEND		GENERAL LEGEND	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
VENTILATION (A/C)			
	ROOM THERMOSTAT		SECTION
	HUMIDISTAT		SECTION DETAIL
	SENSOR		BUILDING SECTION
	HYDROGEN SENSOR		GENERAL DETAIL
	NITROGEN OXIDE SENSOR		DEMOLITION NOTES
	CARBON MONOXIDE SENSOR		DRAWING NOTES
	SUPPLY DUCT		CONNECT TO EXISTING
	RETURN DUCT		DRAWING REVISION
	SUPPLY DUCT (ONE LINE PLAN)		ARCH NUMBER
	RETURN DUCT (ONE LINE PLAN)		
	MOTORIZED DAMPER		
	BALANCING DAMPER		
	FIRE DAMPER		
	BACKDRAFT DAMPER		
	ACOUSTICALLY-LINED DUCT		
	THERMALLY-INSULATED DUCT		
	FLEXIBLE DUCT		
	LINEAR DIFFUSER		
	SQUARE DIFFUSER		
	ROUND DIFFUSER		
	EXHAUST OR RETURN GRILLE		
	WALL GRILLE		
	BRANCH WITH BALANCING DAMPER		
	ACOUSTICALLY-LINED TRANSFER DUCT		
	SQUARE TO ROUND TRANSITION		
	DOOR GRILLE		
	FLEXIBLE CONNECTION		
ELECTRICAL			
	CIRCUIT BREAKER		
	MOTOR - 3 PHASE		
	DISCONNECT		
	CONDUIT, UP		
	CONDUIT, DOWN		
NOT ALL SYMBOLS SHOWN IN LEGEND ARE NECESSARILY USED IN THE DRAWING SET.			

GENERAL NOTES:

- REFER TO DRAWING LEGEND.
- EXCEPT AS NOTED OTHERWISE, ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.
- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO BE REMOVED AND DISPOSED IS SHOWN IN THICK DASHED LINES.
- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
- LAYOUT, ROUTING & LOCATIONS ARE INDICATIVE, CONTRACTOR TO VERIFY SITE CONDITIONS & COORDINATE WITH ALL TRADES ON SITE.
- MECHANICAL DRAWINGS INDICATE ONLY A GENERAL IDEA AND LOCATION OF WORK. CONTRACTOR TO PROVIDE ALL EQUIPMENT, DUCTWORK, ACCESSORIES, ETC. AS REQUIRED AND AS PER SCHEDULES AND SPECIFICATIONS.
- DUCTWORK TO BE INSTALLED PARALLEL OR PERPENDICULAR TO GRID LINES. INSTALL SO AS TO MINIMIZE FURRING SPACE, MAXIMIZE HEADROOM, CONSERVE SPACE.
- PROVIDE NECESSARY COMPENSATORS, ANCHORS, GUIDES, SUPPORTS ETC AND FIRESTOPS FOR ALL AFFECTED SYSTEMS.
- MECHANICAL DRAWINGS ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND GENERAL ARRANGEMENT FOR MECHANICAL SYSTEMS AND EQUIPMENT. CONTRACTOR TO COORDINATE LAYOUT OF MECHANICAL SYSTEMS WITH ARCHITECTURAL, STRUCTURAL AND ELECTRICAL BUILDING COMPONENTS AS WELL AS OTHER MECHANICAL SYSTEMS. PROVIDE ADDITIONAL PIPING, FITTINGS SUPPORTS, ETC. REQUIRED TO FACILITATE THE WORK.
- MECHANICAL CONTRACTOR MUST RETAIN EXISTING BASE BUILDING CONTROLS SERVICE PROVIDER (AIRTRON) TO PROVIDE AND INSTALL ALL CONTROL DEVICES FOR MECHANICAL EQUIPMENT.
- IDENTIFY NEW EQUIPMENT AND PIPING TO NRC STANDARDS AND AS PER SPECIFICATIONS.
- MECHANICAL CONTRACTOR TO PROVIDE ALL REQUIRED SEISMIC CONTROL MEASURES FOR EQUIPMENT AND DUCTWORK. SHOP DRAWINGS SHALL INCLUDE ENGINEERING CALCULATIONS FOR ALL SEISMIC RESTRAINTS AND ATTACHMENTS APPROVED BY A SEISMIC ENGINEER LICENSED IN THE PROVINCE OF ONTARIO. CONTRACTOR TO PROVIDE SEISMIC REVIEW LETTER AT THE COMPLETION OF THE PROJECT STAMPED BY A LICENSED SEISMIC ENGINEER IN ONTARIO.

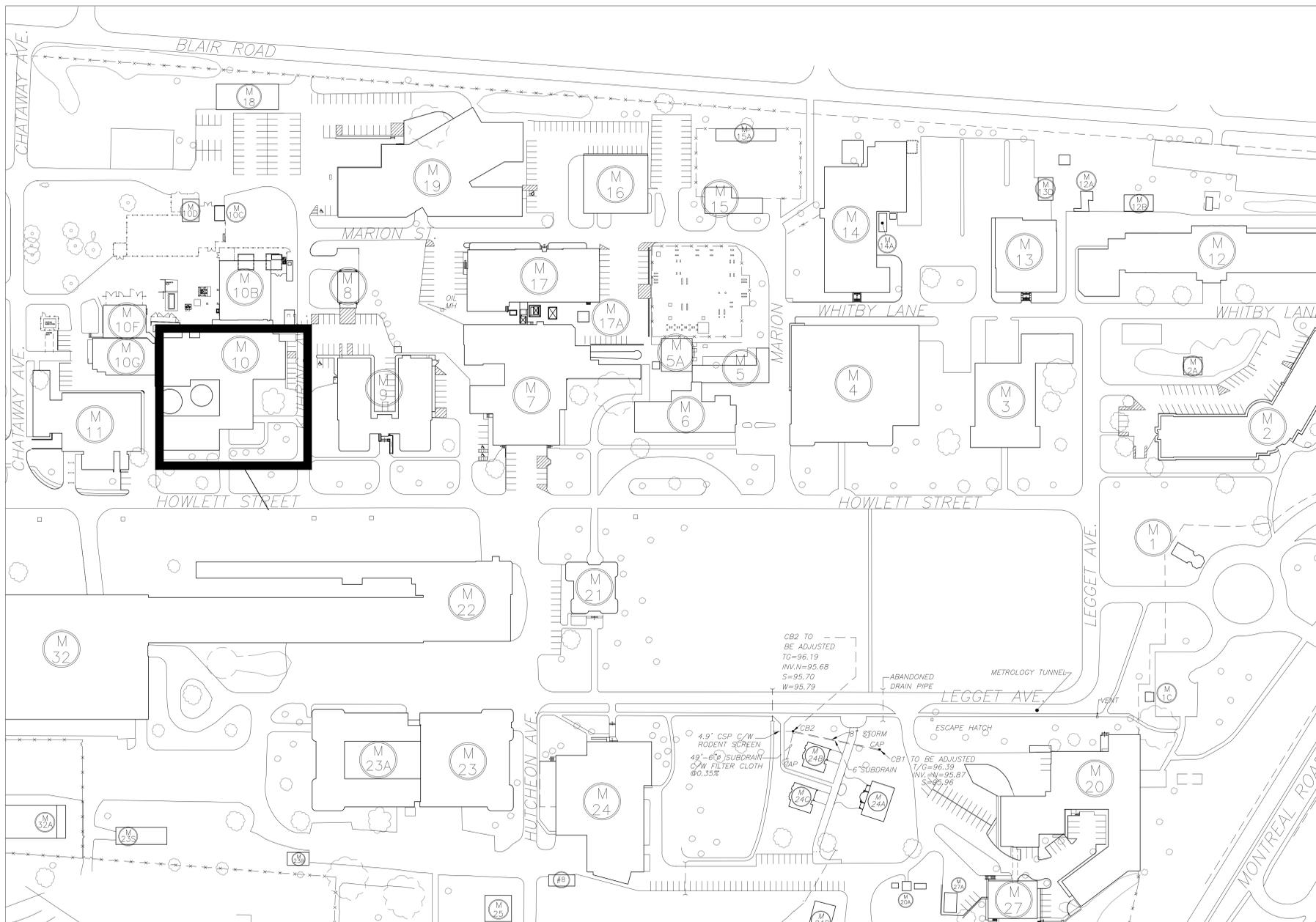
INSTALLATION NOTES:

- MECHANICAL CONTRACTOR IS RESPONSIBLE FOR OFFLOAD, RIGGING, SETTING IN PLACE AND INSTALLATION OF ALL EQUIPMENT. HOISTING AND RIGGING OPERATIONS SHALL BE IN ACCORDANCE WITH AUTHORITY HAVING JURISDICTION. MECHANICAL CONTRACTOR IS RESPONSIBLE TO PAY FOR ALL REQUIRED APPROVALS AND CERTIFICATES RELATED TO SUCH OPERATIONS.
- MECHANICAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF ANY RELATED COMPONENTS IN ORDER TO ALLOW MECHANICAL EQUIPMENT SITE ACCESS. ALLOW FOR REMOVAL AND REINSTATEMENT OF ASSOCIATED ELECTRICAL WORK INCLUDING CONDUITS, WIRING, FIXTURES, ETC.

CONSTRUCTION NOTES:

- CONTRACTOR SHALL RETURN THE COMPLETE AREA OF WORK TO EXISTING CONDITIONS OR BETTER WHEN CONSTRUCTION IS COMPLETE.
- MECHANICAL CONTRACTOR SHALL PROVIDE NEW OPENINGS IN CEILINGS/WALLS AS REQUIRED AND TO THE REQUIREMENTS OF STRUCTURAL DRAWINGS. PATCH AND MAKE GOOD SURFACES TO MATCH EXISTING FOLLOWING COMPLETION OF WORK INCLUDING ALL NECESSARY FIRE STOPPING. ALL NEW CONSTRUCTION - INCLUDING NEW SUPPORTS AND SUSPENSION SYSTEMS WHERE REQUIRED - SHALL BE IN ACCORDANCE WITH CONTRACT SPECIFICATIONS AND CORE REQUIREMENTS.
- ALL CORING AND DRILLING THROUGH FLOORS AND SOLID CONCRETE WALL MUST BE APPROVED BY A STRUCTURAL ENGINEER UNDER THE MECHANICAL CONTRACTOR'S MANDATE AND REVIEWED BY THE OWNER. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ASSOCIATED DAMAGE CAUSED DUE TO CORE DRILLING DURING CONSTRUCTION PERIOD. ULTRASONIC SCANNING IS REQUIRED PRIOR TO ANY CORING AND CUTTING THROUGH FLOORS AND CONCRETE WALLS. THE CONTRACTOR MUST PROVIDE ALL NECESSARY FIRE STOPPING FOR PENETRATIONS.
- BIDDERS MUST FACTOR INTO ACCOUNT AND CARRY ALL COSTS ASSOCIATED WITH ACCOMMODATING OWNER'S CONTINUED USE AND OPERATION OF THE PREMISES DURING CONSTRUCTION. THE ENTIRE IMPLEMENTATION (DEMOLITION AS WELL AS NEW WORK) MUST BE EXECUTED IN PHASES SO THAT THE DAY TO DAY OPERATIONS OF THE OWNER ARE NOT COMPROMISED.
- ALL CORING AND CUTTING MUST BE COMPLETED OUTSIDE NORMAL BUSINESS HOURS.

MECHANICAL/ELECTRICAL DRAWINGS LIST	
DRAWING No.	DRAWING TITLE
ME00	MECHANICAL/ELECTRICAL - GENERAL NOTES, LEGEND, KEY PLAN & DRAWING LIST
ME01	MECHANICAL/ELECTRICAL - BUILDING M10 DEMOLITION
ME02	MECHANICAL/ELECTRICAL - BUILDING M10 NEW CONSTRUCTION
ME03	MECHANICAL/ELECTRICAL - NEW CONSTRUCTION DETAILS



1 KEY PLAN
M00 SCALE NTS

FAN SCHEDULE									
No.	SERVICE	LOCATION	MODEL/SIZE*	CAPACITY (L/S)	E.S.P. (Pa)	VOLTAGE	POWER	RPM	REMARKS
F-1	SUPPLY	ROOF	LPF 36	18,800	500	575/3	30 HP	953	COMPLETE WITH ROOF PENHOUSE, ROOF CURB, NEW 8\"/>
F-2	EXHAUST	OUTSIDE NORTH WALL	BAV 36S	13750	500	575/3	25 HP	1199	COMPLETE WITH BACKDRAFT DAMPER, OUTLET SHUTTER, WEATHER COVER, AND VFD CONTROLLER. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
F-3	EXHAUST	WEST WALL	BSI 24SA	5000	500	575/3	10 HP	1235	COMPLETE WITH BACKDRAFT DAMPER, FLEXIBLE CONNECTIONS, VFD CONTROLLER, LEFT TYPE CONFIGURATION. REFER TO SPECIFICATIONS FOR MORE INFORMATION.

* ALL SELECTIONS BASED ON TWIN CITY FAN
* ALL MOTORS TO BE HIGH EFFICIENCY WITH CLASS F INSULATION SUITABLE FOR USE WITH VFD

GRILLES AND DIFFUSERS SCHEDULE					
TYPE	SERVICE	SIZE	FINISH	MODEL*	REMARKS
A	RETURN	1200X450	-	514SH	514SH - 48 X 18 - S
B	SUPPLY	1200X900	-	515H	515H - 48 X 36 - NF

* SELECTIONS BASED ON NALOR

TEMPERATURE CONTROL

THERMOSTAT SET POINTS
 TEMPERATURE LOW SET POINT @ 25°C
 TEMPERATURE HIGH SET POINT @ 30°C
 TEMPERATURE HIGH HIGH SET POINT @ 40°C

ROOM TEMPERATURE BELOW 25°C
 = F-1 OFF AFTER 5 MINUTE DELAY
 = F-2 OFF AFTER 5 MINUTE DELAY
 = F-3 OFF AFTER 5 MINUTE DELAY

ROOM TEMPERATURE AT 25°C
 = F-1 VFD ON AT 25% MOTOR SPEED
 = F-2 VFD ON AT 25% MOTOR SPEED
 = F-3 VFD ON AT 25% MOTOR SPEED

ROOM TEMPERATURE 26-29°C
 = F-1 VFD ON AT 26-99% MOTOR SPEED
 = F-2 VFD ON AT 26-99% MOTOR SPEED
 = F-3 VFD ON AT 26-99% MOTOR SPEED

ROOM TEMPERATURE AT 30°C
 = F-1 VFD ON AT 100% MOTOR SPEED
 = VFD ON AT 100% MOTOR SPEED
 = F-3 VFD ON AT 100% MOTOR SPEED

ROOM TEMPERATURE AT 40°C
 = F-1 VFD ON AT 100% MOTOR SPEED
 = VFD ON AT 100% MOTOR SPEED
 = F-3 VFD ON AT 100% MOTOR SPEED

ALARM TO BE SENT TO BAS IN M-6

CONTROLLER SHALL USE THE HIGHEST TEMPERATURE DETECTED FROM EITHER OF THE TWO TEMPERATURE SENSORS TO DETERMINE WHETHER VENTILATION IS REQUIRED.

WHEN TEMPERATURE OF THE SPACE IS 25°C OR HIGHER IS DETECTED ALL FANS ARE TURNED ON TO 25% MOTOR SPEED BY THE VFD. IF THE TEMPERATURE CONTINUES TO RISE THE SPEED OF THE FANS WILL BE INCREASED GRADUALLY. IF THE TEMPERATURE OF THE SPACE REACHES 30°C THE FANS WILL BE AT 100% MOTOR SPEED. IF THE TEMPERATURE OF THE SPACE CONTINUES TO RISE, AT 40°C AN ALARM WILL BE SENT TO THE BAS IN M-6. AS TEMPERATURE DROPS THE FAN SPEEDS WILL DECREASE GRADUALLY. WHEN THE TEMPERATURE DROPS BACK DOWN BELOW 25°C THE FANS WILL REMAIN ON AT 25% SPEED FOR 5 MINUTES AND THEN SHUT OFF.

CONTROL POINTS LIST

NO.	POINT NUMBER	POINT DESIGNATION	POINT TYPE	POINT HARDWARE	FUNCTION
1	FV01	F-1 FAN START/STOP	DO	RELAY	CONTROL
2	FV02	F-1 FAN STATUS	AI	CURRENT SENSING RELAY	MONITOR
3	FV03	F-1 FAN SPEED	AO	VFD	CONTROL
4	FV04	F-2 FAN START/STOP	DO	RELAY	CONTROL
5	FV05	F-2 FAN STATUS	AI	CURRENT SENSING RELAY	MONITOR
6	FV06	F-2 FAN SPEED	AO	VFD	CONTROL
7	FV07	F-3 FAN START/STOP	DO	RELAY	CONTROL
8	FV08	F-3 FAN STATUS	AI	CURRENT SENSING RELAY	MONITOR
9	FV09	F-3 FAN SPEED	AO	VFD	CONTROL
10	TS01	SPACE AIR TEMP SENSOR	A1	DDC TEMPERATURE SENSOR	MONITOR
11	TS02	SPACE AIR TEMP SENSOR	A1	DDC TEMPERATURE SENSOR	MONITOR

National Research Council Canada
 Administrative Services and Property Management Branch
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 Division des services administratifs et gestion de l'immobilier

NRC - CNRC

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Stantec

No.	Date	Revision	By	Appr.
D	14.10.10	RE-ISSUED FOR TENDER	J.H.	
C	14.03.28	ISSUED FOR TENDER	J.H.	
B	14.03.28	ISSUED FOR 99% CLIENT REVIEW	J.H.	
A	14.03.07	ISSUED FOR 30% REVIEW	J.H.	

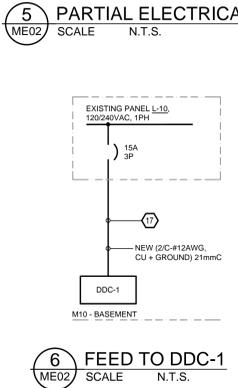
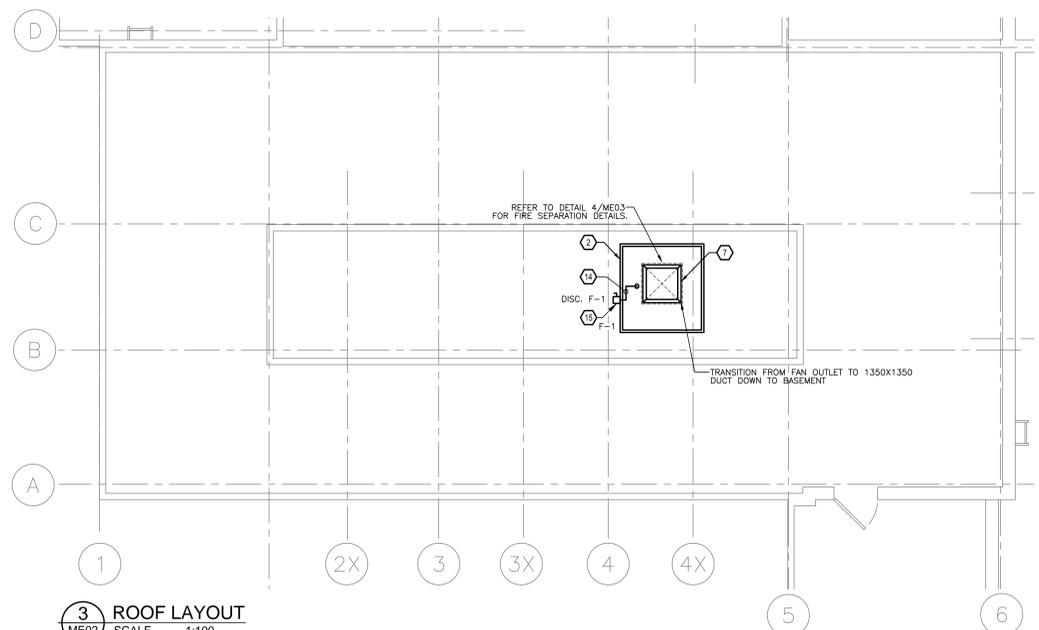
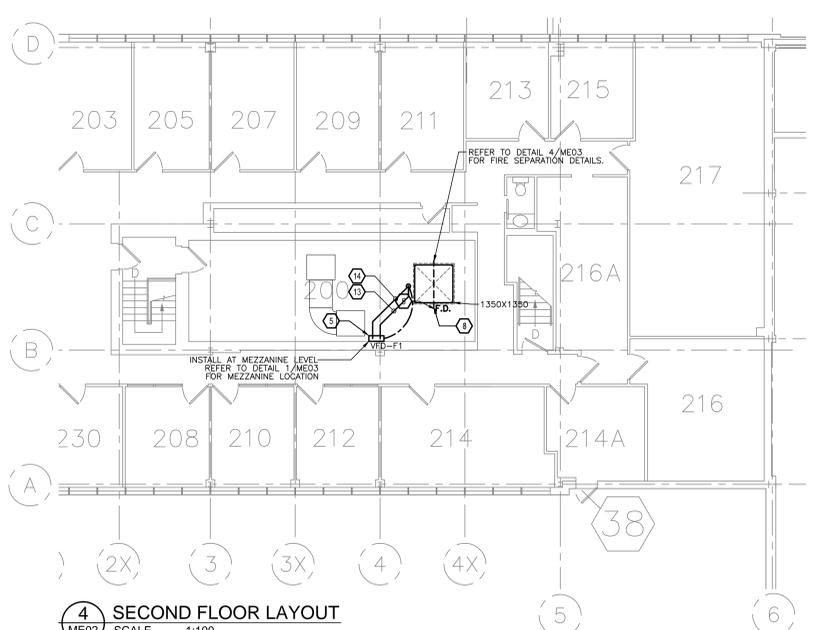
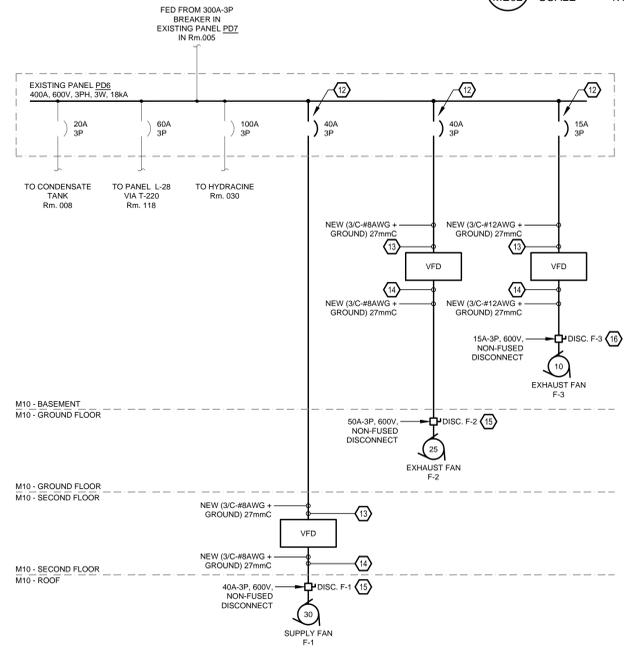
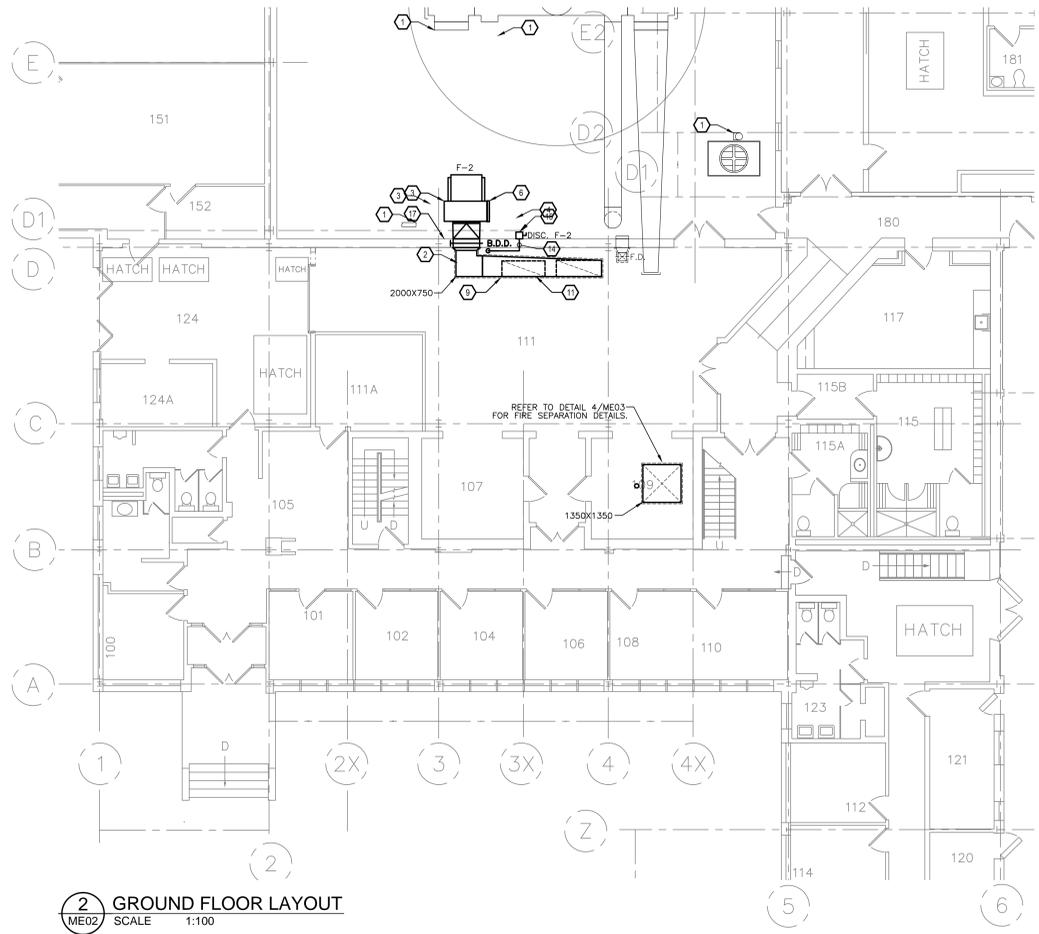
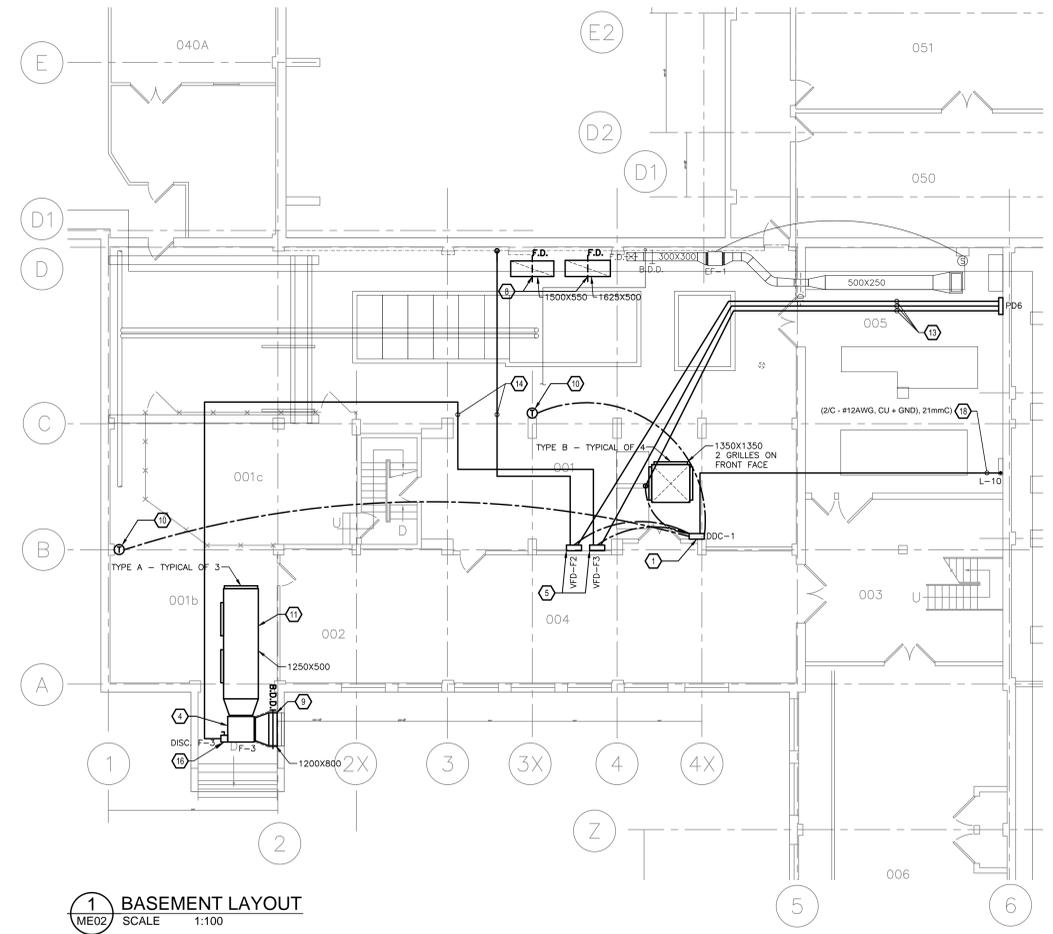
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A	A Detail no. No. du détail	A
C	B Location drawing no. sur dessin no. C Drawing no. dessin no.	B C

M10 ELECTRICAL VAULT VENTILATION

MECHANICAL/ELECTRICAL GENERAL NOTES, LEGEND, KEY PLAN AND DRAWING LIST

designed	conçu	date	date	D-4021-ME00
JH	JH	FEBRUARY 2014	FEBRUARY 2014	
drawn	dessiné	scale	échelle	D-4021-ME00
BL	BL	1:100	1:100	
checked	vérifié	sheet	feuille	D-4021-ME00
JH	JH	1 of 3	1 of 3	
approved	approuvé	W.O.no.	D.T.no.	D-4021-ME00
JH	JH			
dwg.no.	dessin no.	Stantec No: 163301507		D-4021-ME00



- DRAWING NOTES**
- CONTROLS CONTRACTOR TO PROVIDE AND INSTALL NEW DDC DIGITAL CONTROLLER. CONTROLLER SHALL BE TIED TO EXISTING NRC BAS. CONTROLLER SHALL BE CAPABLE OF PROVIDING REQUIRED CONTROL LOGIC WITH ADEQUATE QUALITY AND TYPE OF INPUTS/OUTPUTS FOR CONTROL OF FAN SPEED THROUGH VFD'S. SET POINT ADJUSTMENT WITH KEYPAD AND DISPLAY. CONTROLS CONTRACTOR TO CONNECT NEW VENTILATION SYSTEM TO EXISTING BAS. REFER TO TEMPERATURE CONTROL SCHEDULE AND POINTS LIST ON DRAWING ME02.
 - PROVIDE AND INSTALL NEW ROOF MOUNTED LOUVERED PENTHOUSE SUPPLY FAN (F-1), COMPLETE WITH ALL RELATED SUPPORTS, FLEXIBLE CONNECTIONS, ACCESSORIES, MANUFACTURER ROOF CURB, MEV'S RATED OR EQUIVALENT FILTERS, VFD AND SEISMIC RESTRAINTS. COORDINATE WITH ALL OTHER DISCIPLINES. PROVIDE REQUIRED CLEARANCE FOR FAN MAINTENANCE AND SERVICE. SUPPLY FAN TO BE INTERLOCKED WITH NEW DDC CONTROLLER IN BASEMENT ELECTRICAL ROOM. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS. REFER TO FAN SCHEDULE, DISCONNECT SWITCH AND ELECTRICAL CONNECTION BY DIVISION 26.
 - PROVIDE AND INSTALL NEW EXHAUST FAN (F-2), COMPLETE WITH ALL RELATED SUPPORTS, FLEXIBLE CONNECTIONS, ACCESSORIES, BACKDRAFT DAMPER, BELT GUARDS, WEATHER COVER, OUTLET SCREEN, OUTLET SHUTTER, VFD AND SEISMIC RESTRAINTS. COORDINATE WITH ALL OTHER DISCIPLINES. ENSURE REQUIRED CLEARANCE FOR FAN MAINTENANCE AND SERVICE CLEARANCE. EXHAUST FAN TO BE INTERLOCKED WITH NEW DDC CONTROLLER. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS. COORDINATE LOCATION WITH GENERAL CONTRACTOR. REFER TO FAN SCHEDULE, DISCONNECT SWITCH AND ELECTRICAL CONNECTION BY DIVISION 26.
 - PROVIDE AND INSTALL NEW EXHAUST FAN (F-3) COMPLETE WITH ALL RELATED SUPPORTS, FLEXIBLE CONNECTIONS, ACCESSORIES, BACKDRAFT DAMPER, BELT GUARDS, AND SEISMIC RESTRAINTS. COORDINATE WITH ELECTRICAL. ENSURE REQUIRED CLEARANCE FOR FAN MAINTENANCE AND SERVICE CLEARANCE. EXHAUST FAN TO BE INTERLOCKED WITH NEW DDC CONTROLLER. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS. COORDINATE LOCATION WITH GENERAL CONTRACTOR. REFER TO FAN SCHEDULE, DISCONNECT SWITCH AND ELECTRICAL CONNECTION BY DIVISION 26.
 - PROVIDE NEW VARIABLE FREQUENCY DRIVE (VFD) FOR EXHAUST FAN AS PER SPECIFICATIONS AND SUITABLE FOR THE EQUIPMENT POWER REQUIREMENT. PROVIDE ALL NECESSARY CONTROL WIRING, HARDWARE, UNISTRUT SUPPORTS, ACCESSORIES, ETC. PROVIDE OUTPUT LINE REACTORS/FILTERS FOR THE VFD'S. COORDINATE WITH ALL TRADES AND INTEGRATE VFD'S WITH NEW DDC CONTROLLER. COORDINATE ALL POWER REQUIREMENTS WITH DIV. 26 AND INSTALL AS PER MANUFACTURER'S RECOMMENDATIONS. REFER TO SPECIFICATIONS, TYPICAL OF 3.
 - SUPPLY AND INSTALL NEW EXHAUST FAN OUTLET SHUTTER, SUITABLE FOR OUTDOOR APPLICATION, COMPLETE WITH INTERLOCKED MOTORIZED ACTUATOR.
 - PROVIDE AND INSTALL NEW RECTANGULAR SUPPLY AIR DUCT CONNECTED TO ROOF MOUNTED PENTHOUSE SUPPLY FAN, COMPLETE WITH ALL REQUIRED SUPPORTS, FITTINGS, SEISMIC RESTRAINTS, ACCESSORIES, FLEXIBLE CONNECTIONS AND TRANSITIONS. OUTLET TO ALLOW FOR CONNECTION OF NEW DUCTWORK TO FAN OUTLET. PROVIDE AND INSTALL 50MM INSULATION ON DUCTWORK FROM ROOF PENTHOUSE SUPPLY FAN CONNECTION TO BASEMENT LEVEL. LENGTH OF DUCTWORK APPROXIMATELY 12 METERS FROM ROOF TO BASEMENT LEVEL. CONTRACTOR SHALL CONFIRM ON SITE PRIOR TO SUBMITTING BID.

- DRAWING NOTES (CONTINUED)**
- PROVIDE AND INSTALL NEW FIRE DAMPER AT FLOOR LEVEL. INSTALL AS PER NFPA AND MANUFACTURER REQUIREMENTS. TYPICAL OF 4.
 - PROVIDE AND INSTALL 50MM INSULATION ON DUCTWORK WITHIN GROUND FLOOR.
 - CONTROLS CONTRACTOR TO PROVIDE AND INSTALL NEW DIGITAL TEMPERATURE SENSOR CAPABLE OF COMMUNICATING AND INTEGRATING WITH NEW DDC CONTROLLER. TEMPERATURE SENSOR SHALL BE COMPLETE WITH ALL REQUIRED ACCESSORIES, RELAYS, CONTROLS WIRING.
 - PROVIDE AND INSTALL NEW EXHAUST DUCT COMPLETE WITH BIRD SCREEN, ALL RELATED SUPPORTS, TRANSITIONS, SEISMIC RESTRAINTS, FLEXIBLE CONNECTIONS, FITTINGS AND ACCESSORIES. CONTRACTOR TO VERIFY LOCATION AND COORDINATE INSTALLATION WITH BUILDING STRUCTURE, ELECTRICAL SERVICES AND ARCHITECTURAL DETAILS.
 - SUPPLY AND INSTALL NEW BREAKERS IN EXISTING PANEL PD6. BREAKERS TO BE MANUFACTURED BY SAME MANUFACTURER OF EXISTING PANEL PD6. INTERRUPTING RATING OF BREAKERS TO BE GREATER THAN OR EQUAL TO 18KA.
 - SUPPLY AND INSTALL NEW FEEDER CABLES, AS INDICATED, FROM NEW BREAKERS IN PANEL PD6 TO NEW VFD'S.
 - SUPPLY AND INSTALL NEW FEEDER CABLES, AS INDICATED, FROM NEW VFD'S TO NEW EXHAUST FAN DISCONNECTS AND FROM EXHAUST FAN DISCONNECTS TO MOTORS.
 - SUPPLY NEMA 4 DISCONNECTS ADJACENT TO FAN F-1 AND FAN-2, WITHIN 9m AND WITHIN SITE OF THE MOTORS AS PER THE ONTARIO ELECTRICAL SAFETY CODE.
 - SUPPLY NEW DISCONNECT ADJACENT TO FAN-3, WITHIN 9m AND WITHIN SITE OF THE MOTORS AS PER THE ONTARIO ELECTRICAL SAFETY CODE.
 - CONTRACTOR TO REMOVE TEMPORARY WALL AND INSTALL PERMANENT WALL SYSTEM. REFER TO DETAIL 3/ME03. WALL TO BE BUILT TO ACCOMMODATE NEW EXHAUST DUCT.
 - SUPPLY AND INSTALL NEW 120V CIRCUIT FROM PANEL L-10 TO DDC-1. CONNECT CIRCUIT TO EXISTING 15A, SINGLE POLE SPARE BREAKER IN PANEL L-10.

D	14.10.10	RE-ISSUED FOR TENDER	J.H.
C	14.03.28	ISSUED FOR TENDER	J.H.
B	14.03.28	ISSUED FOR 99% CLIENT REVIEW	J.H.
A	14.03.07	ISSUED FOR 30% REVIEW	J.H.

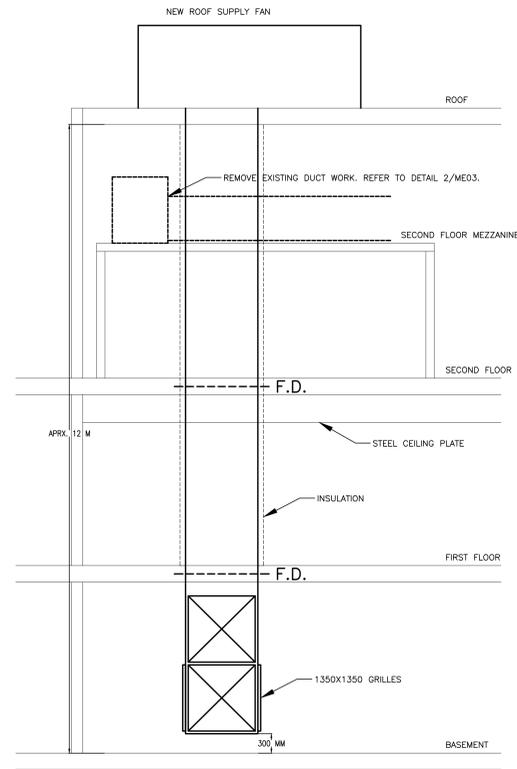
- Date Printed: _____ Date Imprimée: _____
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A	A Detail no. / No. du détail	A
B	B Location drawing no. / sur dessin no.	B
C	C Drawing no. / dessin no.	C

PROJECT: **M10 ELECTRICAL VAULT VENTILATION**

MECHANICAL/ELECTRICAL BUILDING M10 NEW CONSTRUCTION

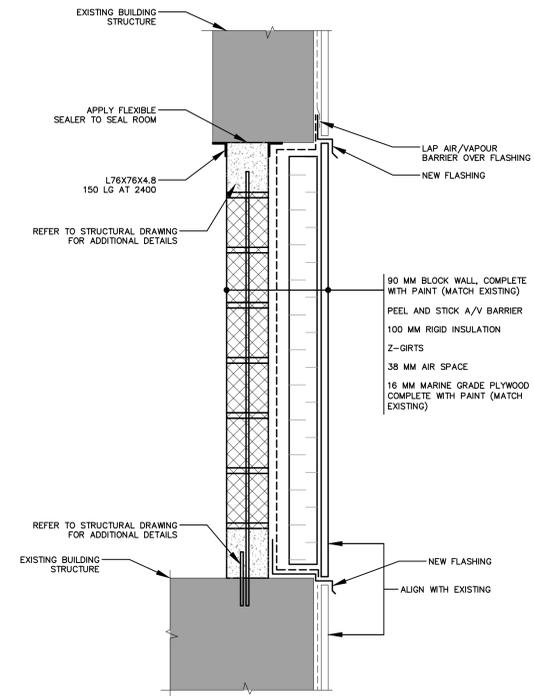
designed	JH	conçu	scale	1:100	échelle	date	FEBRUARY 2014
drawn	BL	dessiné	sheet	2	of/de	3	feuille
checked	JH	vérifié	W.O.no.		D.T.no.		
approved	JH	approuvé	Stantec No.	163301507	dessin no.		
dwg.no.	D-4021-ME02						



1 APPROXIMATE DUCT ELEVATION VIEW
 ME03 SCALE N.T.S.

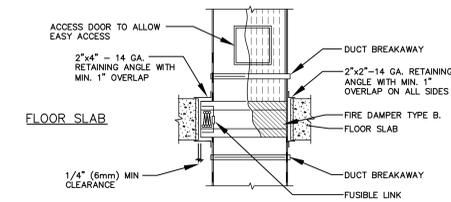


2 MEZZANINE DUCTWORK TO BE REMOVED
 ME03 SCALE N.T.S.

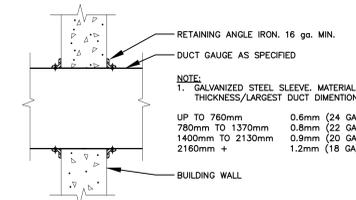


3 BLOCK WALL CONSTRUCTION DETAIL
 ME03 SCALE N.T.S.

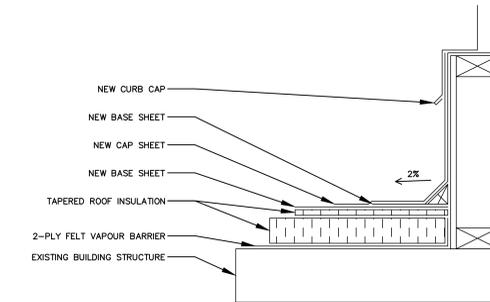
NOTES:
 1. CONTRACTOR TO PROVIDE A MOCK-UP OF FIRE DAMPER INSTALLATION AND SEEK CONSULTANT'S APPROVAL BEFORE PROCEEDING TO INSTALL ALL FIRE DAMPERS.



4 FIRE PENETRATION DETAIL
 ME03 SCALE NTS



5 DUCT THROUGH WALL DETAIL
 ME03 SCALE NTS



6 ROOF CURB DETAIL
 ME03 SCALE NTS

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Date Printed: _____ Date Imprimée: _____
 • Verify all dimensions and site conditions and be responsible for same
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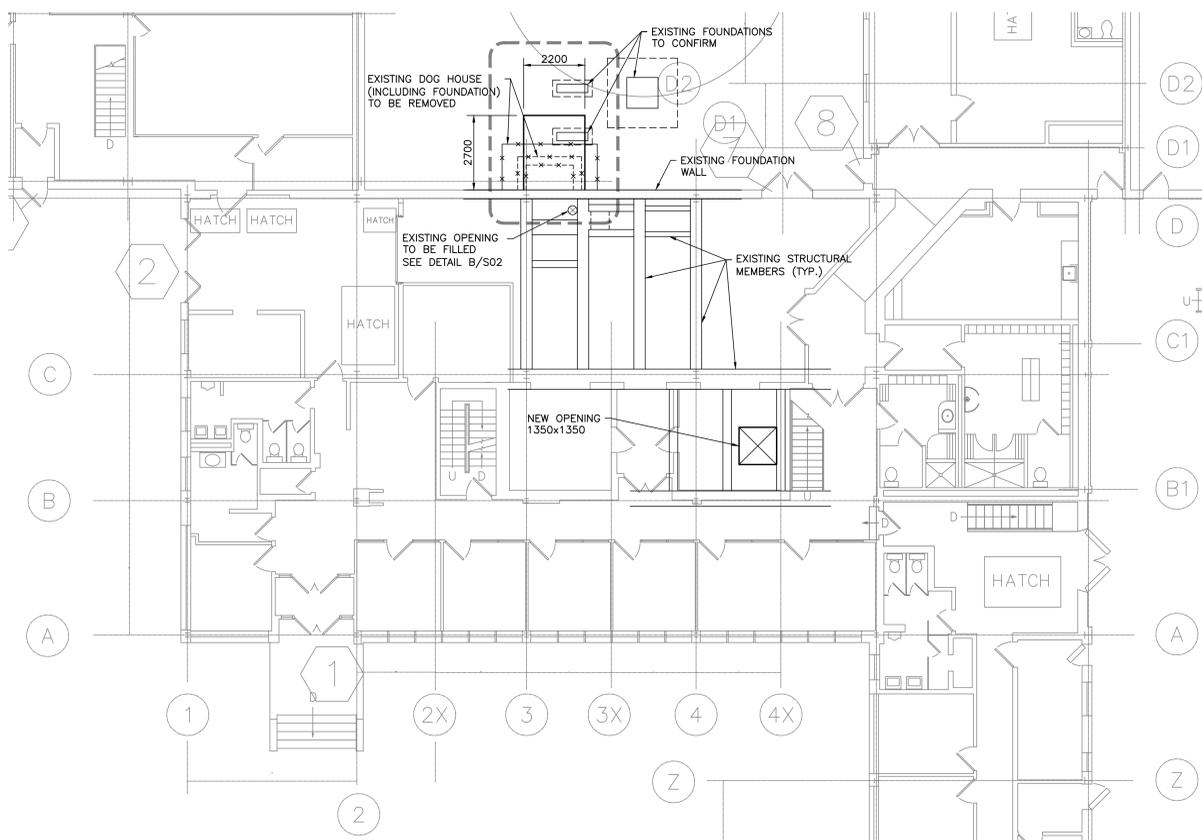
A	A Detail no. No. du détail	A
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C	C Drawing no. dessin no.	C

project: **M10 ELECTRICAL VAULT VENTILATION** projf

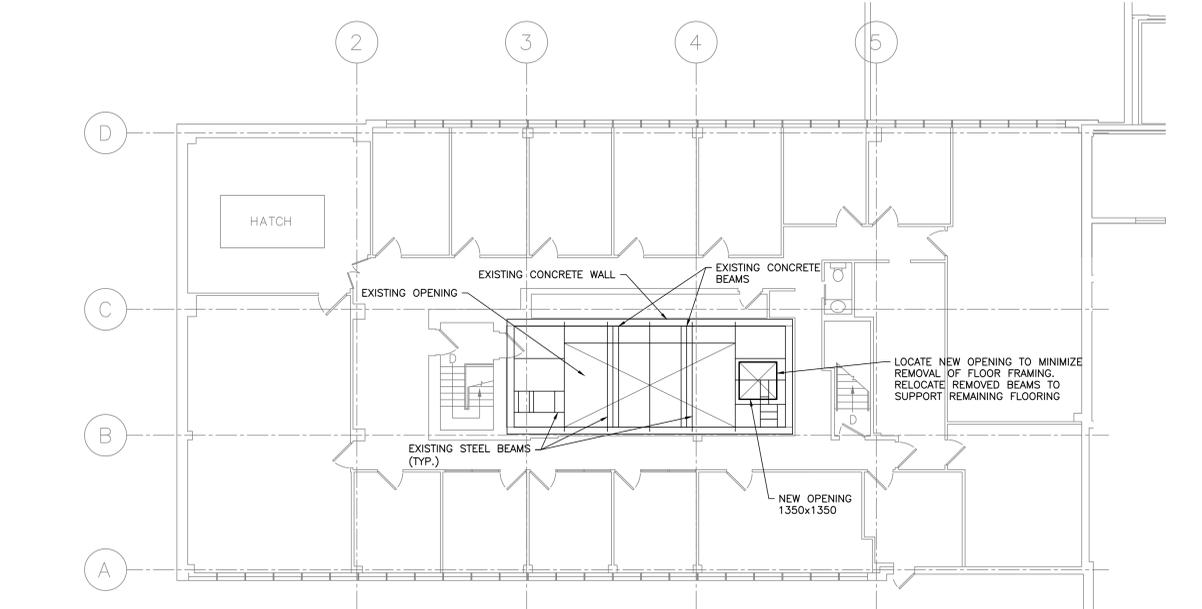
drawing: **MECHANICAL/ELECTRICAL BUILDING M10 NEW CONSTRUCTION DETAILS** dessin

designed	JH	conçu	date	FEBRUARY 2014	date	J.H.
drawn	BL	dessiné	scale	1:100	échelle	BL
checked	JH	vérifié	sheet	3 of/ de 3	feuille	JH
approved	JH	approuvé	W.O. no.		D.T. no.	JH
dwg. no.			Shantec No:	163301507	dessin no.	

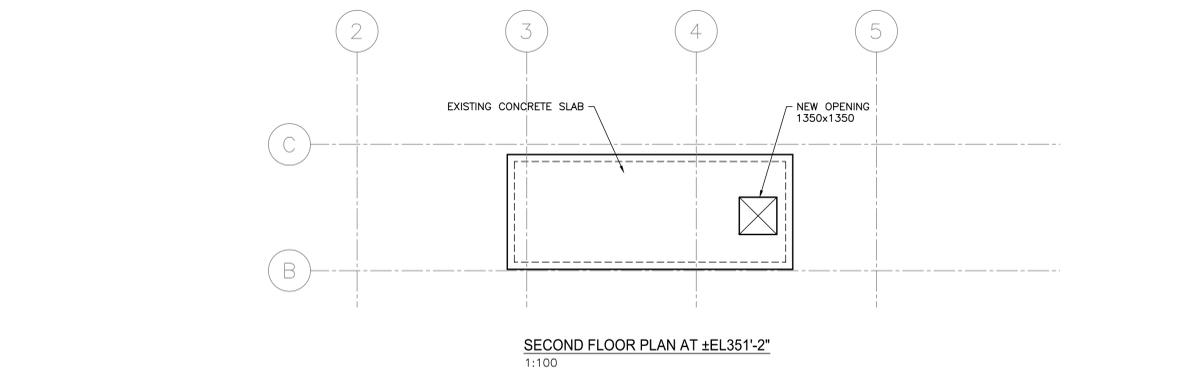
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 D-4021-ME03



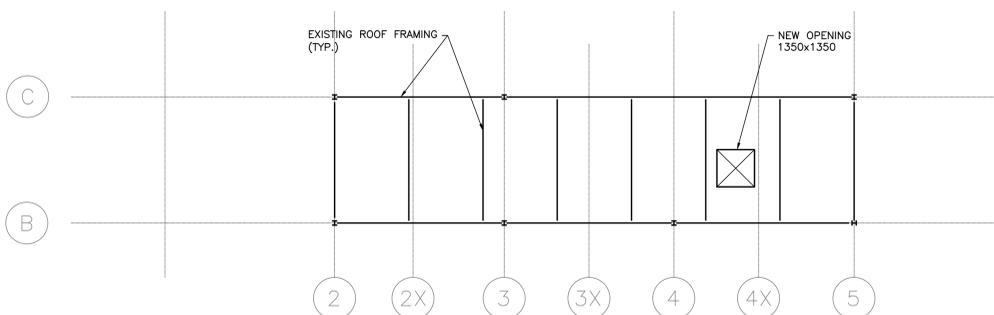
GROUND FLOOR PLAN AT EL327'-6"
1:100



SECOND FLOOR PLAN AT EL342'-6"
1:100



SECOND FLOOR PLAN AT EL351'-2"
1:100



ROOF PLAN AT EL360'-8"
1:100

GENERAL NOTES

- ALL CODES REFERENCED ARE TO BE THE LATEST VERSION AT THE DATE OF ISSUE.
- DESIGN IS BASED ON THE NATIONAL BUILDING CODE NBC 2010.
- READ THESE DESIGN NOTES IN CONJUNCTION WITH THE CONTRACT SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS.
- OBTAIN ENGINEER'S APPROVAL BEFORE CUTTING, BORING, OR SLEEVEING LOAD-BEARING MEMBERS UNLESS NOTED OTHERWISE.
- THE STRUCTURAL DRAWINGS ARE FOR THE COMPLETED PROJECT. STABILITY OF THE EXISTING STRUCTURE DURING CONSTRUCTION REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
- REFER TO ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR SMALL OPENINGS, SLEEVES, RECESSES, DEPRESSIONS, SUMPS, TRENCHES, CURBS, HOUSEKEEPING PADS, EQUIPMENT BASES, AND SLOPES NOT INDICATED ON THE STRUCTURAL DRAWINGS.
- OPENINGS AND SLEEVES INDICATED ON THE STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY. COORDINATE ALL OPENING LOCATIONS AND DIMENSIONS WITH THE APPROPRIATE CONSULTANT AND THE SUB-CONTRACTOR PRIOR TO CONSTRUCTION.
- REVIEW ALL DRAWINGS AND CHECK DIMENSIONS PRIOR TO IMPLEMENTING THE WORK. REPORT ANY DISCREPANCIES TO THE CONSULTANT FOR CLARIFICATION BEFORE PROCEEDING.
- COORDINATE PLACEMENT AND LOCATION OF ITEMS BY SUBSEQUENT TRADES. RELEVANT TRADES SHALL REVIEW PRIOR TO ERECTION AND/OR INSTALLATION.
- NOTIFY THE ENGINEER A MINIMUM OF 24 HOURS PRIOR TO ANY REQUIRED SITE REVIEWS.
- EXISTING STRUCTURE, BEAMS AND/OR SUPPORTS ARE NOT TO BE IMPACTED OR MODIFIED UNLESS NOTED.

EXISTING STRUCTURES

- THE STRUCTURAL DESIGN IS BASED ON INFORMATION GATHERED FROM THE RECORD DRAWINGS AND FROM LIMITED VISUAL OBSERVATIONS ON SITE.
- VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS ON SITE PRIOR TO IMPLEMENTING AFFECTED WORK.
- NOTIFY THE CONSULTANT OF ANY SITE CONDITIONS THAT DIFFER FROM THE CONTRACT DOCUMENTS OR THE RECORD DRAWINGS.
- EXISTING DRAWINGS INDICATE ASBESTOS CAVITY DECKING AT ROOF OF BUILDING ±360'8".

DESIGN LOADS

- UNLESS NOTED OTHERWISE, THE LOADS NOTED IN TABLES AND ON DRAWINGS ARE UNFACTORED.
- CLIMATIC INFORMATION REFER TO CLIMATIC INFORMATION TABLE BELOW
- SITE INFORMATION REFER TO SITE INFORMATION TABLE BELOW

DELEGATED DESIGN

- PORTIONS OF THE DETAILED DESIGN ARE DELEGATED TO THE CONTRACTOR. RETAIN A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF ONTARIO TO COMPLETE THE DESIGN.
- SUBMIT SHOP DRAWINGS FOR COMPONENTS REQUIRING DELEGATED DESIGN UNDER THE SEAL AND SIGNATURE OF THE ENGINEER RESPONSIBLE FOR THE DESIGN.
- THE FOLLOWING COMPONENTS REQUIRE DELEGATED DESIGN:
 - STRUCTURAL STEEL CONNECTIONS
- THE ENGINEER RESPONSIBLE FOR THE DESIGN IS ALSO RESPONSIBLE FOR REVIEW OF FABRICATION AND INSTALLATION OF THE COMPONENTS. UPON COMPLETION OF THE WORK, CERTIFY IN WRITING TO THE CONSULTANT THAT SUCH REVIEW HAS BEEN COMPLETED.
- REFER TO SPECIFICATIONS FOR FURTHER REQUIREMENTS.

FOUNDATION AND GEOTECHNICAL NOTES

- REMOVE ALL ORGANIC MATERIAL FROM THE SLAB AREA.
- REMOVE ANY METAL MECHANICAL EQUIPMENT LOCATED UNDER SLAB ON GRADE.
- CUT DOWN EXISTING FOUNDATION TO UNDERSIDE OF SLAB.

CAST-IN-PLACE REINFORCED CONCRETE

- CONCRETE MATERIALS, QUALITY, MIXING, PLACING, FORMWORK AND OTHER CONSTRUCTION PRACTICES TO CONFORM TO CSA-A23.1.
- SUPPLY CONTROLLED CONCRETE IN ACCORDANCE WITH CSA-A23.1 WITH PROPERTIES NOTED IN SPECIFICATION 03.3000.
- USE TYPE GU CEMENT FOR ALL CONCRETE UNLESS NOTED OTHERWISE IN CONTROLLED CONCRETE TABLE.
- NOTIFY CONSULTANT 24 HOURS PRIOR TO CONCRETE POURS TO ALLOW FOR REVIEW OF REINFORCEMENT.
- DO NOT USE ADMIXTURES CONTAINING CALCIUM CHLORIDE.
- FOR FLOOR SLABS, DESIGN THE CONCRETE MIX WITH AGGREGATE GRADING AND WATER TO CEMENTING MATERIALS RATIO TO MINIMIZE SHRINKAGE.
- FIELD AND LABORATORY TESTING OF CONCRETE TO BE COMPLETED BY A THIRD PARTY TESTING AND INSPECTION AGENCY APPROVED BY AND RESPONSIBLE TO THE ENGINEER. TESTING AGENCY SHALL BE CERTIFIED TO CSA-A283 AND TESTING TO BE COMPLETED IN ACCORDANCE WITH CSA-A23.2. TESTING PAID FOR BY CONTRACTOR.

CONCRETE REINFORCEMENT

- REINFORCEMENT STEEL TO CONFORM TO CSA-G30.18 GRADE 400.
- DO NOT WELD REINFORCEMENT UNLESS APPROVED IN WRITING BY THE ENGINEER. REINFORCEMENT TO BE WELDED TO CONFORM TO CSA-G30.18, GRADE 400W. WELDING ONLY PERMITTED BY AN ORGANIZATION CERTIFIED TO CSA-W186.
- NOTIFY THE ENGINEER PRIOR TO CONCRETE PLACEMENT TO ALLOW FOR REVIEW OF REINFORCEMENT.
- SUBMIT SHOP DRAWINGS AND DETAILS FOR ALL REINFORCEMENT FOR REVIEW PRIOR TO FABRICATION.
- CLEAR CONCRETE COVER TO REINFORCEMENT - 50 MM.

CLIMATIC INFORMATION	
TO BE READ IN CONJUNCTION WITH MASONRY DESIGN NOTES	
SNOW LOAD (1/50), S _s	2.4 kPa
SNOW LOAD (1/50), S _r	0.4 kPa
ONE DAY RAIN (1/50)	91mm
HOURLY WIND PRESSURE (1/10)	0.32 kPa
HOURLY WIND PRESSURE (1/50)	0.41 kPa
SEISMIC RESPONSE, S _s (0.2)	0.63
SEISMIC RESPONSE, S _s (0.5)	0.31
SEISMIC RESPONSE, S _s (1.0)	0.14
SEISMIC RESPONSE, S _s (2.0)	0.046
SEISMIC RESPONSE, PGA	0.32

SITE INFORMATION	
TO BE READ IN CONJUNCTION WITH MASONRY DESIGN NOTES	
IMPORTANCE CATEGORY	NORMAL
WIND EXPOSURE TYPE	OPEN TERRAIN
INTERNAL PRESSURE CATEGORY	1
FOUNDATION SITE CLASS	D

CONCRETE FORMWORK

- DESIGN, FABRICATION, ERECTION, AND OTHER CONSTRUCTION PRACTICES TO CONFORM TO CAN/CSA-S269.3.

STRUCTURAL STEEL

- DESIGN, FABRICATION, ERECTION, AND OTHER CONSTRUCTION PRACTICES TO CONFORM TO CSA-S16 AND THE CISC CODE OF STANDARD PRACTICE FOR STRUCTURAL STEEL.
- STEEL TO BE FABRICATED AND ERECTED BY A SHOP CERTIFIED BY THE CANADIAN WELDING BUREAU TO THE REQUIREMENTS OF CSA-W47.1, DIVISION 1 OR 2.1 ONLY.
- SUBMIT SHOP DRAWINGS SHOWING ALL STRUCTURAL STEEL MEMBERS FOR REVIEW PRIOR TO FABRICATION. WELDING TO CONFORM TO CSA-W59.
- WELDING TO CONFORM TO CSA-W59. WELDING TO CONFORM TO CSA-W186 WITH REINFORCEMENT CONFORMING TO CSA-G30.18, GRADE 400W.
- ALL EXPOSED WELDS TO BE CONTINUOUS. GRIND ALL EXPOSED WELDS SMOOTH, INCLUDING PAINTED STEEL.
- SUPPLY STEEL WITH PROPERTIES NOTED IN SPECIFICATION 05 12 23.
- CONNECTIONS NOT DETAILED ON THE STRUCTURAL DRAWINGS SHALL BE DESIGNED AND DETAILED BY A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE PROVINCE OF ONTARIO AT THE STEEL FABRICATOR'S EXPENSE.
- PROVIDED A MINIMUM OF 2 BOLTS IN BOLTED CONNECTIONS.
- ALL BOLTED CONNECTIONS TO USE SNUG-TIGHTENED HIGH-STRENGTH BOLTS UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- PROVIDE 10 mm PLATE STIFFENERS EACH SIDE OF BEAM WHERE AT ALL BEARING CONNECTIONS UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- DO NOT SPlice MATERIAL WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER. WHERE GRANTED, A COMPLETE NON-DESTRUCTIVE EXAMINATION WILL BE MANDATORY AND PAID FOR BY THE SUB-CONTRACTOR.
- SQUARE CUT OR FULL STRENGTH WELD ALL COLUMNS AT BASE PLATES AND AT TOP WHERE BEARING UNDER CONTINUOUS BEAMS.
- CLEAN, PREPARE AND PRIME ALL STRUCTURAL STEEL AND ANCHOR PLATES. DO NOT PRIME ANCHOR BOLTS OR SURFACES IN CONTACT WITH CONCRETE.
- CLEAN ALL INTERIOR STRUCTURAL STEEL NOT TO BE FINISH PAINTED BY WIRE BRUSHING. REMOVE ALL RUST, DIRT, MILL SCALE, WELD SPATTER AND ALL OTHER EXTRANEOUS MATERIAL IN ACCORDANCE WITH SSPC SPECIFICATIONS SP2 BEFORE APPLYING ONE-COAT PAINT TO ALL SURFACES EXCEPT THOSE TO BE IN CONTACT WITH CONCRETE OR TO BE FIRE-SPRAY PROTECTED. REFER TO ARCHITECTURAL ROOM FINISH SCHEDULES FOR EXTENT.
- CLEAN ALL INTERIOR STRUCTURAL STEEL THAT IS TO BE FINISH PAINTED BY COMMERCIAL BLAST IN ACCORDANCE WITH SSPC SPECIFICATIONS SP6 TO ENSURE BASE STEEL IS THOROUGHLY CLEANED OF ALL RUST, DIRT, MILL SPATTER AND ALL OTHER EXTRANEOUS MATERIAL FOLLOWED BY SOLVENT CLEANING BEFORE APPLYING PRIMER. REFER TO ARCHITECTURAL ROOM FINISH SCHEDULE FOR EXTENT. CONFIRM COMPATIBILITY BETWEEN PAINT AND PRIMER.
- TOUCH-UP FIELD WELDS, CONNECTIONS AND ABRASIONS TO MATCH THE SHOP PRIMER.
- SHOP AND FIELD INSPECTION OF STEEL FABRICATION AND ERECTION TO BE COMPLETED BY A THIRD PARTY TESTING AND INSPECTION AGENCY APPROVED BY AND RESPONSIBLE TO THE ENGINEER. TESTING AGENCY SHALL BE CERTIFIED TO CSA-W178. TESTING PAID FOR BY CONTRACTOR.

MASONRY

- DESIGN, FABRICATION, ERECTION, AND OTHER CONSTRUCTION PRACTICES TO CONFORM TO CSA-S304.1 AND CAN/CSA-A371.
- CONCRETE BLOCK TO CONFORM TO CAN/CSA-A165 WITH A MINIMUM COMPRESSIVE STRENGTH OF 15 MPa BASED ON THE NET CROSS-SECTIONAL AREA OF THE UNITS WITH VOIDS.
- FILL CELLS CONTAINING VERTICAL REINFORCEMENT WITH CONCRETE DESIGNATED AS MASONRY COREFILL IN SPECIFICATION 040500.
- PUDDLE OR VIBRATE MASONRY COREFILL IN LIFTS NOT EXCEEDING 1200 mm.
- USE ONLY TYPE S MORTAR CONFORMING TO CSA-A179. DO NOT USE MASONRY CEMENT. USE PORTLAND CEMENT AND LIME ONLY.
- PROVIDE CLEAN-OUT OPENINGS AT THE BOTTOM OF EACH LIFT FOR ALL CELLS BEING FILLED. THE INSIDE OF THE CELL IS TO BE FREE FROM DEBRIS AND OBSTRUCTION.
- HORIZONTAL JOINT REINFORCEMENT TO CONFORM TO ASTM A185/A185M. PROVIDE CONTINUOUS REINFORCEMENT CONSISTING OF 2 - 9 GAUGE DIAMETER WIRE TRUSS TYPE REINFORCEMENT WITH WELDED CROSS-TIES AT A VERTICAL SPACING OF 400 mm FOR RUNNING BOND.
- ALTERNATE HORIZONTAL JOINT REINFORCING TO BOND ADJOINING WALLS.
- MASONRY WALLS TO BE RUNNING BOND UNLESS NOTED OTHERWISE.
- EXTEND VERTICAL REINFORCEMENT TO WITHIN 50 mm OF TOP OF WALLS.
- PROVIDE VERTICAL DOWELS INTO SUPPORTING CONCRETE TO MATCH BLOCK WALL REINFORCEMENT.
- PROVIDE 400 mm DEEP BOND BEAMS REINFORCED WITH 1-15M TOP AND BOTTOM AT THE TOPS OF ALL WALLS. USE SPECIAL BOND BEAM UNITS TO PROVIDE CONTINUITY OF HORIZONTAL REINFORCEMENT. LAP SPLICE 800 mm MINIMUM. PROVIDE CORNER BARS AT WALL INTERSECTIONS.
- PROVIDE VERTICAL REINFORCEMENT AS NOTED ON DRAWINGS. PROVIDE ADDITIONAL COREFILLS WITH DESIGNATED REINFORCEMENT AT ENDS OF WALLS, WALL INTERSECTIONS, CORNERS, AND EACH SIDE OF WINDOW OPENING, DOOR OPENINGS, AND CONTROL JOINTS.
- REINFORCEMENT SPLICES AS FOLLOWS:
 - 15M - 600MM

NOTES

- ALL DIMENSIONS IN MILLIMETER UNLESS NOTED OTHERWISE.
- CONTRACTOR TO VERIFY ALL DIMENSIONS, LOCATIONS AND STRUCTURAL ELEMENTS ON SITE PRIOR TO CONSTRUCTION.
- DIMENSION AND SIZE OF OPENINGS ARE APPROXIMATE. CONTRACTOR TO COORDINATE LOCATION/SIZE OF OPENINGS WITH MECHANICAL DRAWINGS.
- SCAN EXISTING SLABS WITH SUITABLE EQUIPMENT (GROUND PENETRATION RADAR OR EQUIVALENT) IN ORDER TO LOCATE ANY UTILITIES PRIOR TO CUTTING CONCRETE. NOTIFY CONTRACT ADMINISTRATOR IF UTILITIES ARE ENCOUNTERED.
- SAW CUT CONCRETE SLABS FOR OPENINGS.
- EXISTING DRAWINGS INDICATE ASBESTOS CAVITY DECKING AT ROOF OF BUILDING ±360'8".

No.	Date	Revision	By	P.W.
C	14.10.10	RE-ISSUED FOR TENDER		P.W.
C	12.12.20	ISSUED FOR 95% REVIEW		P.W.
B	12.09.18	ISSUED FOR 60% REVIEW		P.W.
A	12.08.29	ISSUED FOR 33% REVIEW		P.W.

Date Printed: _____ Date Imprimée: _____
 • Verify all dimensions and site conditions and be responsible for same
 • Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité

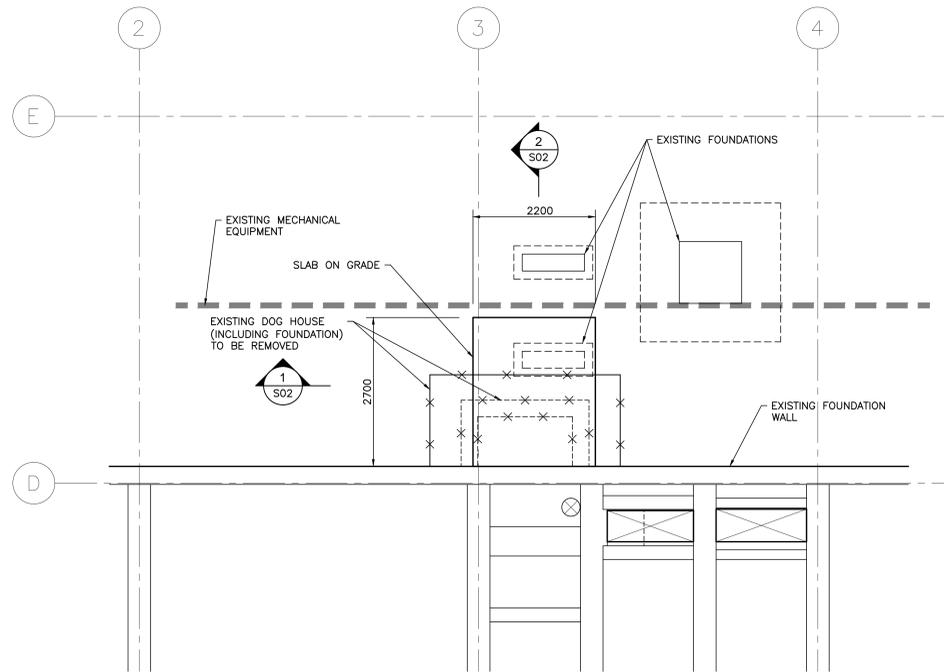
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B	B Location drawing no. / sur dessin no.	B
C	C Drawing no. / dessin no.	C

project: MRL HYDRO SUBSTATION UPGRADE + NORTH CAMPUS ELECTRICAL DIST. UPGRADE
 drawing: STRUCTURAL BUILDING M10 FLOOR PLANS

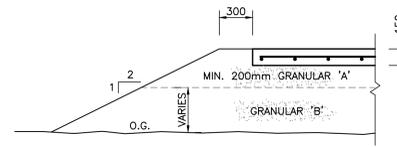
designed	compd	date	date
P.W.		AUGUST 2012	
drawn	designé	scale	échelle
Y.W.		AS SHOWN	
checked	vérifié	sheet	feuille
P.W.		1 of 22	22
approved	approuvé	W.O. no.	D.T. no.
P.W.			
dwg. no.	dessin no.		
D-4021-S01	163301507		

NOTES

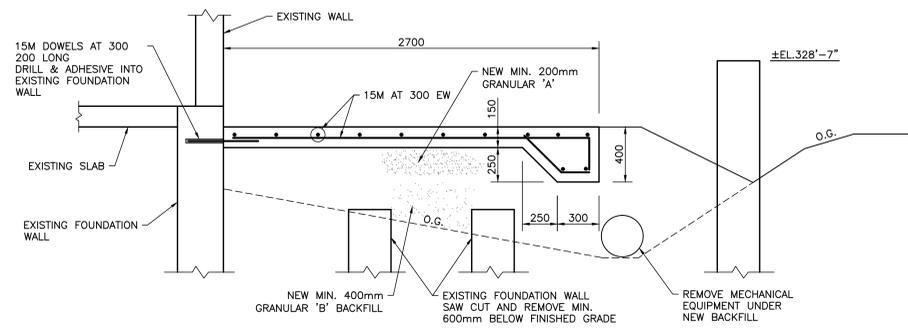
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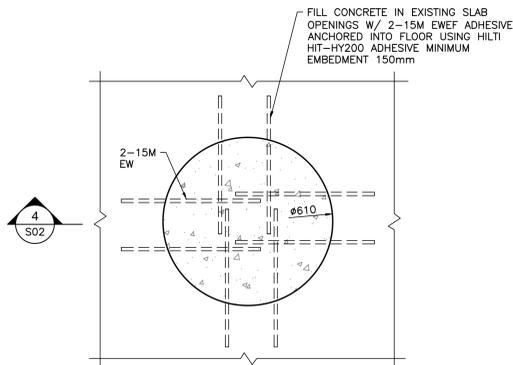
DETAIL
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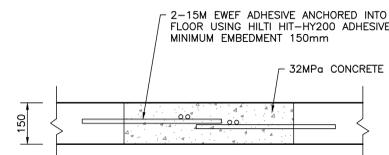
1 SECTION
 N.T.S.



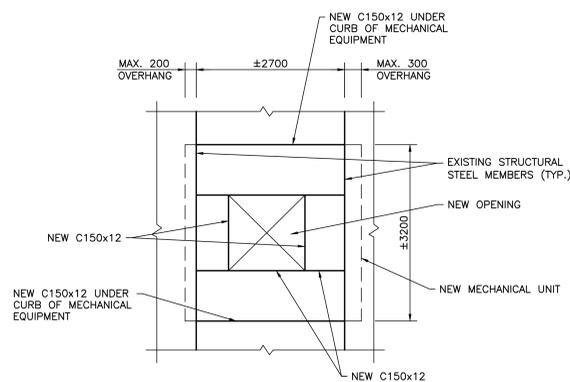
2 SLAB ON GRADE - TYP. SECTION
 1:20



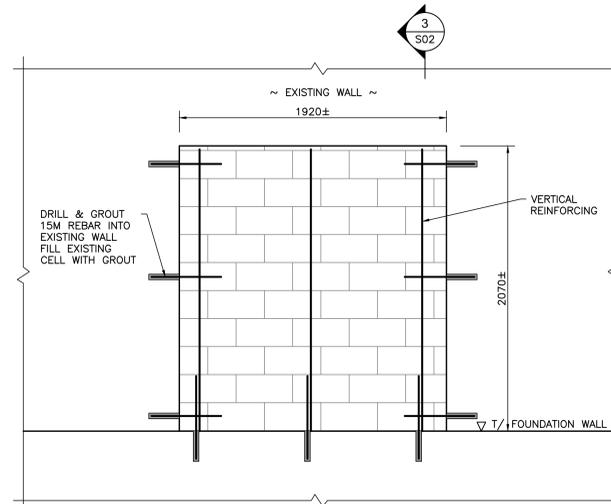
FLOOR HOLE INFILL DETAIL
 1:10



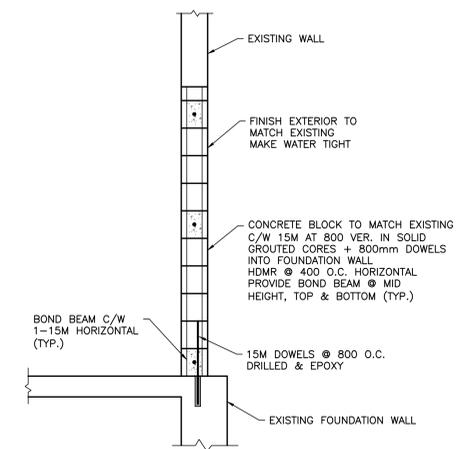
4 SECTION
 1:10



TYP. OPENING FRAMING
 N.T.S.



WALL OPENING INFILL - TYP. ELEVATION
 N.T.S.



3 WALL SECTION
 N.T.S.

No.	Date	Revision	By	Appr.
C	14.10.10	RE-ISSUED FOR TENDER		P.W.
C	12.12.20	ISSUED FOR 95% REVIEW		P.W.
B	12.09.18	ISSUED FOR 66% REVIEW		P.W.
A	12.08.29	ISSUED FOR 33% REVIEW		P.W.

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- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité

A	A Detail no. No. du détail	A
C	B Location drawing no. sur dessin no.	B C
	C Drawing no. dessin no.	

project: **MRL HYDRO SUBSTATION UPGRADE + NORTH CAMPUS ELECTRICAL DIST. UPGRADE**
 MONTREAL ROAD CAMPUS

drawing: **STRUCTURAL BUILDING M10 SECTIONS AND DETAILS**

designed	conçu	date	date	designed
P.W.		AUGUST 2012		P.W.
drawn	dessiné	scale	échelle	
Y.W.		AS SHOWN		
checked	vérifié	sheet	feuille	
P.W.		2 of/de 22		
approved	approuvé	W.O.no.	D.T.no.	
P.W.				
dwg.no.		Shantec No: 163301507	dessin no.	

D-4021-S02