Addendum 02 - M&E Questions & Answers

January 27, 2020
Addendum 02
The Fitness Lab Addition

1. Please find enclosed addendum for additional information regarding M&E.

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TTF ENGINEERING

Fitness Lab Expansion
5536 Ann Street.

Addendum No. 1 – MECHANICAL & ELECTRICAL

Date: January 17, 2020

Answers to RFI's

Referenced Document: Issued for Permit Jul 5/19

Question: What is the circuit and power requirement for the hook up of the RTU-1?
TTF Answer: See attached drawing M-5 & E-1 issued Addendum #1.

Question: What model or type of light fixture is the Ceiling light fixture Type A, provide a model number or a specification.
TTF Answer: See attached drawing E-1 issued Addendum #1.

Question: What is the specs on the Big Ass Fan.
TTF Answer: See attached drawing E-1 issued Addendum #1.

Changes to Design – Referenced Drawings:

TTF Mechanical Drawings "ADDENDUM #1" on Jan 17th, 2019 – SEE ATTACHED

DRAWING M-1

Item A1-1

Duct sizing and CFM changed to accommodate for smaller air hander unit (RTU-1).

Item A1-2

Drawing note 1 updated to 5 ton air handing unit.

DRAWING M-5

Item A1-3

Specification for air handler unit updated with new requirements.

<u>Changes to Design – Referenced Drawings:</u>
TTF Electrical Drawings "ADDENDUM #1" on Jan 17th, 2019 – SEE ATTACHED

<u>DRAWING E-1</u>

Item A1-4
Light fixture legend added. Type 'A' fixtures updated.

Item A1-5
Drawing note 2 updated. Mounting height for fixtures added.

Item A1-6
Ceiling fan model provided in drawing note 3.

Item A1-7
Power to new air handling unit (RTU-1) added to drawing. Weather proof disconnected added. Corresponding drawing note 6 added.

Item A1-8
The service pole and isolated ground receptacle sections of the specification were deleted.

--END OF ADDENDUM-

HVAC LEGEND

NEW/RELOCATED	DESCRIPTION
	36"x12" RETURN AIR GRILLE
BD	TAKE OFF COMES WITH BALANCING DAMPER
D ##	CIRCULAR DIFFUSER 'D' INDICATES SIZE (DIAMETER) ##INDICATES AIRFLOW (CFM)

PLUMBING LEGEND

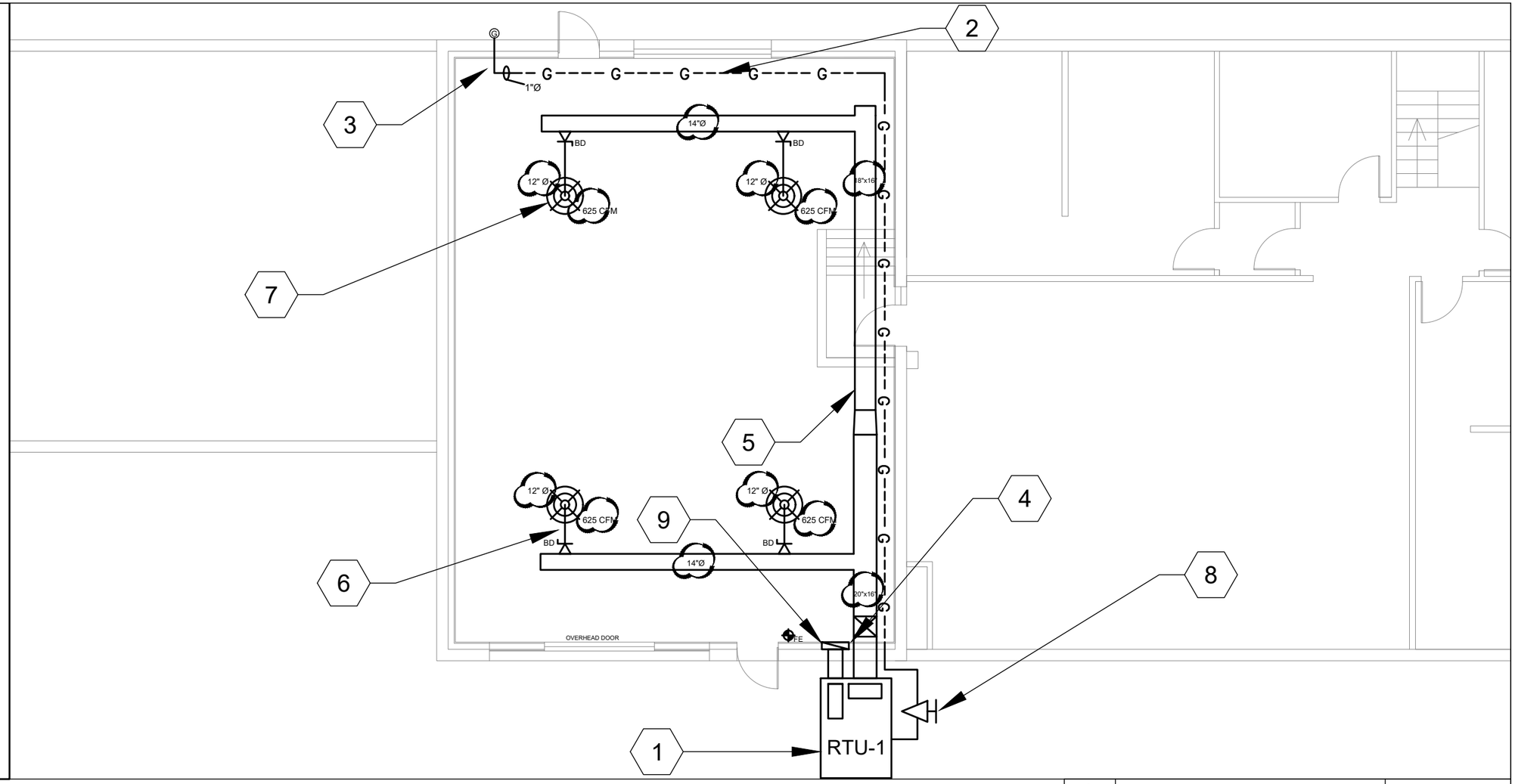
	NATURAL GAS PIPING

VALVE LEGEND

	PLUG VALVE
G	GAS METER

FIRE PROTECTION LEGEND

FE	FIRE EXTINGUISHER



DRAWING NOTES:

1. SEE A.H.U. AND NATURAL GAS SCHEMATIC FOR ASSEMBLY DETAILS. PROVIDE NEW 5 TON A.H.U.
2. PROVIDE NEW NATURAL GAS PIPING.
3. NATURAL GAS PIPING TO RISE UP TO UNDERSIDE OF CEILING SPACE.
4. DUCTWORK TO RISE UP TO UNDERSIDE OF CEILING SPACE. LEAVE 6" OF SPACE FOR DUCTWORK.
5. PROVIDE NEW DUCTWORK.
6. DROP DIFFUSERS 2' DOWN FROM DUCTWORK
7. PROVIDE NEW TYPE 'A' DIFFUSERS.
8. PROVIDE NEW ISOLATION VALVE.
9. PROVIDE NEW 36"X12" RETURN AIR GRILLE.

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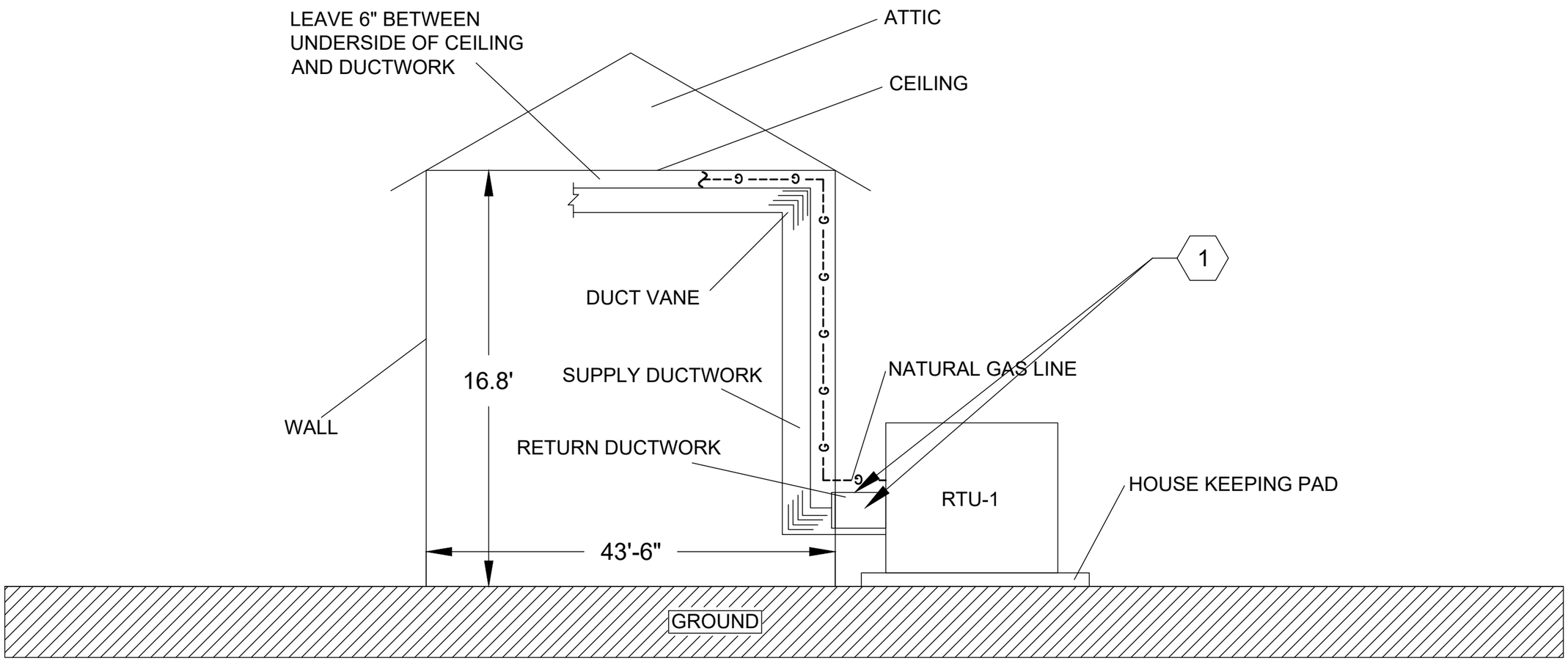
AHU AND NATURAL GAS SCHEMATIC

NOT TO SCALE



DRAWING NOTES:

1. PROVIDE WEATHERPROOF DUCT INSULATION ON EXTERIOR DUCTWORK ONLY.

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DOCUMENTATION

1. THESE DOCUMENTS ARE AN INTEGRAL PART OF THE CONTRACT DOCUMENTS. THE INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS OF THE ARCHITECTURAL DOCUMENTS ARE FULLY BINDING TO THE MECHANICAL CONTRACT.
2. REFER TO OTHER DIVISIONS TO ENSURE FULL COORDINATION.
3. "PROVIDE" IN THIS DIVISION MEANS TO "SUPPLY AND INSTALL."

COMMISSIONING

1. PLAN, ORGANIZE AND IMPLEMENT THE COMMISSIONING PROCESS FOR MECHANICAL SYSTEMS AND EQUIPMENT. SUPPLY COMPLETE INSTRUCTIONS AND INFORMATION RELATING TO THE OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND SYSTEMS. DELIVER A SYSTEM WHICH PERFORMS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND EQUIPMENT MANUFACTURER'S REQUIREMENTS.

MECHANICAL SYSTEM SUPPORT, AND ANCHORAGE (SEISMIC)

1. PROVIDE SUPPORT, ANCHORAGE AND RESTRAINT OF MECHANICAL DISTRIBUTION SYSTEMS AND EQUIPMENT, DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO BUILDING CODE; ASHRAE APPLICATIONS, SMACNA DUCT CONSTRUCTION STANDARDS; AND ANSI/NFPA 13 INSTALLATION OF SPRINKLER SYSTEMS.
2. COORDINATE MECHANICAL SYSTEM SUPPORT, ANCHORAGE, AND RESTRAINT SYSTEM WITH THE REQUIREMENTS AND CONSTRAINTS OF THE STRUCTURE, VIBRATION ISOLATION SYSTEMS, AND THE SUPPORT. ANCHORAGE, AND RESTRAINT SYSTEMS FOR ELECTRICAL AND ARCHITECTURAL COMPONENTS OF THE BUILDING.
3. CONTRACTOR TO ALLOW FOR SEISMIC REVIEW OF ALL NEW INSTALLATIONS AND PROVIDE ENGINEER-STAMPED DOCUMENTS OUTLINING SEISMIC MEASURES TAKEN.

PROJECT SCHEDULE

1. PHASE WORK IN ACCORDANCE WITH DIVISION 1. PROVIDE CONSULTANT WITH MATERIAL DELIVERY SCHEDULE WITHIN ONE(1) WEEK OF EXECUTING THE AGREEMENT.

DRAWINGS AND MEASUREMENTS

1. DRAWINGS DO NOT INDICATE EXACT ARCHITECTURAL, STRUCTURAL OR ELECTRICAL FEATURES. EXAMINE DRAWINGS PRIOR TO LAYING OUT,FABRICATING AND INSTALLING WORK TO ENSURE NO INTERFERENCE EXISTS. REPORT CONFLICT WITH WORK TO CONSULTANT
2. DRAWINGS SHOW GENERAL DESIGN AND ARRANGEMENT OF MECHANICAL SYSTEM INSTALLATION, AND ARE DIAGRAMMATIC IN SOME DETAILS. COORDINATE WITH ALL TRADES FOR COMPLETE OPERATIONAL SYSTEM.
3. DO NOT SCALE DRAWINGS TO ORDER MATERIAL. TAKE FIELD MEASUREMENTS BEFORE ORDERING MATERIALS AND MAKE MATERIAL CONFORM TO SITE CONDITIONS.

EXAMINATION

1. THIS PROJECT INVOLVES RENOVATIONS TO AN EXISTING BUILDING. EXAMINE THE SITE AND MAKE ALLOWANCE FOR ALL LOCAL CONDITIONS AFFECTING WORK UNDER THIS CONTRACT PRIOR TO SUBMITTING FINAL PRICE.

PERMITS AND FEES

1. GIVE ALL NECESSARY NOTICE, OBTAIN ALL PERMITS AND PAY ALL FEES IN ORDER THAT THE WORK SPECIFIED HEREIN MAY BE COMPLETED.

CODES AND BY-LAWS

1. COMPLY WITH ALL CODES AND BY-LAWS RELATING TO INSTALLATION AND EQUIPMENT. PROVIDE CERTIFICATES TO VERIFY THAT THE WORK INSTALLED CONFORMS WITH THE LAWS AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.

SHOP DRAWINGS

1. PRIOR TO MANUFACTURE, SUBMIT THREE (3) COPIES OF SHOP DRAWINGS OF SPECIFIED EQUIPMENT FOR REVIEW. DRAWINGS WILL BE REVIEWED FOR SPECIFICATION COMPLIANCE AND ARE TO BE REVISED AS OFTEN AS NECESSARY TO SATISFACTION OF CONSULTANT.

INTERRUPTION OF EXISTING SERVICES

1. ARRANGE SCHEDULE AND PERFORM WORK WITH MINIMUM DISTURBANCE TO EXISTING FACILITIES AND SERVICES. NOTIFY CONSULTANT AND LANDLORD IN WRITING AT LEAST 48 HOURS IN ADVANCE OF PLANNED INTERRUPTION TO EXISTING SERVICE.

REMOVAL AND REUSE OF EXISTING SERVICES

1. PRESENT EXISTING MATERIAL AND EQUIPMENT REMOVED FROM WORK BUT NOT IDENTIFIED FOR RE-USE ON SITE TO OWNER/OTHERS. WHERE DEEMED UNSUITABLE, REMOVE FROM SITE.

PROTECTION OF WORK

1. PROTECT ALL FINISHED AND UNFINISHED WORK FROM DAMAGE. REPAIR DAMAGE CAUSED TO SURFACES OF BUILDING WITHOUT COST TO OWNER AND TO SATISFACTION OF CONSULTANT.
2. BE RESPONSIBLE FOR CONDITION OF ALL MATERIALS AND EQUIPMENT SUPPLIED AND/OR INSTALLED. PROVIDE PROTECTION PRIOR TO, DURING AND AFTER INSTALLATION UNTIL TAKEOVER BY OWNER.

CLEANING

1. DURING COURSE OF CONSTRUCTION AND UPON COMPLETION, REMOVESITE ALL RUBBISH AND WASTE RESULTING FROM THIS WORK TO COMPLETE FROM PROJECT SATISFACTION OF THE CONSULTANT .

CUTTING AND PATCHING

1. ALL CUTTING AND PATCHING REQUIRED TO PERFORM WORK TO BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR MECHANICAL CONTRACTOR TO IDENTIFY LOCATIONS FOR ALL OPENINGS FOR PIPES, DUCTS, ETC., AND PROVIDE SLEEVES REQUIRED TO EXECUTE THE MECHANICAL INSTALLATION.

OPERATIONAL TESTS

1. PERFORM SYSTEMATIC CHECK, TEST COMPONENTS IN ALL SYSTEMS, ENSURE THAT EACH SYSTEM FUNCTIONS CORRECTLY BEFORE COMMENCING BALANCING WORK. PROVIDE ALL PRIMARY ELEMENTS, TEST WELLS, BALANCING DAMPERS, BALANCING VALVES AND PARTS WHICH ARE REQUIRED FOR TESTING AND BALANCING.
2. RECORD ALL CHECKS AND TESTS. MANUFACTURER OR SUPPLIER OF THE COMPONENT TESTED TO SIGN FORM INDICATING THAT INSTALLATION IS IN ACCORDANCE WITH THEIR WRITTEN RECOMMENDATION. COUNTERSIGN AS CONTRACTOR.

TEMPORARY AND TRIAL USE

1. OBTAIN WRITTEN PERMISSION FROM CONSULTANT TO USE AND TEST PERMANENT EQUIPMENT AND SYSTEMS PRIOR TO SUBSTANTIAL PERFORMANCE.
2. PROVIDE LABOUR, MATERIAL AND INSTRUMENTS REQUIRED FOR TESTING. RECTIFY INCOMPLETE WORK IMMEDIATELY TO SATISFACTION OF CONSULTANT . CLEAN AND RENEW EQUIPMENT AND SYSTEM USED PRIOR TO ACCEPTANCE.

BALANCING

1. BALANCING TO BE PERFORMED BY A CERTIFIED BALANCING COMPANY.
2. BALANCE AND ADJUST ALL AIR HANDLING SYSTEMS, EQUIPMENT, DUCTWORK, DIFFUSERS, REGISTERS, ETC., TO OBTAIN AIR QUANTITIES INDICATED. ADJUST FAN SPEEDS AS REQUIRED TO ACHIEVE BALANCE, INCLUDING PROVISION OF REPLACEMENT SHEAVES AND BELTS AS REQUIRED. BALANCE AND ADJUST ALL WATER SYSTEMS TO WATER FLOWS INDICATED.
3. COMPILE DATA FOR ALL TESTING AND BALANCING AND SUBMIT TWO DOCUMENTS TO CONSULTANT.

RECORD DRAWINGS

1. AFTER AWARD OF CONTRACT, CONSULTANT WILL PROVIDE CONTRACTOR WITH A SET OF DRAWINGS FOR PURPOSE OF MAINTAINING RECORD DRAWINGS. ACCURATELY AND NEATLY RECORD DEVIATIONS FROM CONTRACT DOCUMENTS WHICH ARE THE RESULT OF SITE CONDITIONS AND CHANGE ORDERS. RECORD CHANGES IN SAME SCALE AND QUALITY OF ORIGINAL DRAWINGS. IDENTIFY ALL REVISIONS MADE TO CONTRACT DRAWINGS AND REFERENCE FABRICATION DRAWINGS INCLUDED.

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2. ON COMPLETION OF WORK AND PRIOR TO FINAL INSPECTION, SUBMIT RECORD DOCUMENTS TO CONSULTANT.

OPERATING AND INSTRUCTION MANUALS

1. FURNISH CONSULTANT WITH 3 COPIES OF SERVICE, MAINTENANCE, SPARE PARTS AND OPERATING INSTRUCTIONS, SHOP DRAWINGS AND BULLETINS FOR ALL ITEMS INSTALLED. SUBMIT BALANCING REPORT. SUBMIT IN LOOSE-LEAF BINDERS. PROVIDE BINDERS WITH PROPER INDEX AND LIST OF MANUFACTURER'S SERVICE REPRESENTATIVES, INCLUDING ADDRESS AND PHONE NUMBER. PROVIDE STEP-BY-STEP SEQUENCE OF OPERATION DESCRIPTION FOR AUTOMATIC CONTROL SYSTEM.

INSTRUCTION OF OPERATING STAFF

1. PROVIDE TRAINED PERSONNEL TO INSTRUCT OPERATING STAFF IN MAINTENANCE, ADJUSTMENT AND OPERATION OF MECHANICAL EQUIPMENT. PROVIDE INSTRUCTION DURING REGULAR WORK HOURS PRIOR TO ACCEPTANCE AND TURNOVER TO OPERATING STAFF. USE OPERATION AND MAINTENANCE DATA MANUAL AND UPDATED RECORD DRAWINGS FOR INSTRUCTION PURPOSES.

INSULATION

1. HOT PIPING: RIGID GLASS FIBRE, PREFORMED SECTIONAL, [88 KG/M^3] [5 LB/FT^3], [316°C] [600°F], [0.035 W/M°C @ 24°C] [0.250 BTU.IN./HR.FT^2 @ 75°F]. THICKNESS: [25 MM] [1"].
2. COLD PIPING: RIGID GLASS FIBRE, PREFORMED SECTIONAL, [88 KG/M^3] [5 LB/FT^3], [316°C] [600°F], [0.035 W/M°C @ 24°C] [0.250 BTU.IN./HR.FT^2 @ 75°F], WITH FACTORY APPLIED VAPOUR BARRIER JACKET. THICKNESS: [25 MM] [1"].
3. DUCTWORK, THERMAL, ROUND [AND RECTANGULAR] DUCT: FLEXIBLE GLASS FIBRE [16 KG/M^3] [1 LB/FT^3], [120°C] [250°F], [0.036 W/M°C @ 24°C] [0.250 BTU.IN./HR.FT^2 @ 75°F], WITH FACTORY APPLIED VAPOUR BARRIER JACKET. THICKNESS: [25 MM] [1"].
4. DUCTWORK, THERMAL, RECTANGULAR DUCT: RIGID GLASS FIBREBOARD, [72 KG/M^3] [4.5 LB/FT^3], [120°C] [250°F], [0.032 W/M°C @ 24°C] [0.220 BTU.IN./HR.FT^2 @ 75°F], WITH FACTORY APPLIED VAPOUR BARRIER JACKET. THICKNESS: [25 MM] [1"] EXCEPT FOR OUTSIDE AIR AND EXHAUST DUCTWORK PROVIDE [50 MM] [2"]. PROVIDE AS INDICATED EXCEPT FOR OUTSIDE AIR AND EXHAUST. PROVIDE ON OUTSIDE AIR UP TO AIR HANDLING UNIT. FOR EXHAUST PROVIDE FOR [2 M] [6'-6"] FROM LOUVRE.

DUCTWORK

1. RECTANGULAR DUCTWORK: CONSTRUCT DUCTWORK AND FITTINGS TO SMACNA AND ASHRAE STANDARDS FOR LESS THAN [500 PA] [2"] W.G. DUCT STATIC PRESSURE RANGE, [1.0 M/S] [2000 FPM] MAXIMUM VELOCITY. USE LOCK FORMING QUALITY GALVANIZED STEEL WITH G90 DESIGNATION ZINC COATING TO ASTM A525-75.
2. ROUND DUCTWORK: GALVANIZED STEEL WITH G90 DESIGNATION, ZINC COATING TO ASTM A525-75. ROUND FITTINGS TO BE OF WELDED CONSTRUCTION FABRICATED FROM [1.0 MM] [20 GAUGE] GALVANIZED STEEL SHEETS. TEES, REDUCERS, Y-BRANCHES AND OTHER FITTINGS TO BE AS INDICATED ON THE DRAWINGS AND CONFORM TO ASHRAE AND SMACNA STANDARDS.
3. FLEXIBLE DUCTWORK: DUCTWORK AND CONNECTORS TO COMPLY WITH OR EXCEED THEREQUIREMENTS OF UL "STANDARDS FOR SAFETY AIR DUCTS", UL-181, CLASS 1 AND NFPA 90A. FLEXIBLE DUCT LENGTHS NOT TO EXCEED [1500 MM] [5 FT.].FLEXIBLE DUCTWORK: DUCTWORK AND CONNECTORS TO COMPLY WITH OR EXCEED THE REQUIREMENTS OF UL "STANDARDS FOR SAFETY AIR DUCTS", UL-181, CLASS 1 AND NFPA 90A. FLEXIBLE DUCT LENGTHS NOT TO EXCEED [1500 MM] [5 FT.].
4. ALL DUCTWORK & PLENUMS TO BE SEALED AND PRESSURE TESTED IN ACCORDANCE WITH ASHRAE 90.1

GRILLES AND DIFFUSERS

1. PROVIDE GRILLES AND DIFFUSERS COMPLETE WITH ACCESSORIES AS INDICATED ON DRAWINGS. POSITIONS INDICATED ARE APPROXIMATE ONLY. MECHANICAL CONTRACTOR TO VERIFY LOCATION OF ALL OUTLETS AND MAKE SUCH ADJUSTMENTS AS NECESSARY TO CONFORM WITH ARCHITECTURAL FIXTURES.
2. TYPE 'A': EGGCRATE RETURN GRILLE, ALUMINUM,1/2" X 1/2" GRID, SIZES AS INDICATED, TO FIT LAY-IN TILE CEILING. SPECIFIED PRODUCT: EH PRICE 80 SERIES
3. TYPE 'B': DOUBLE REFLECTION SUPPLY GRILLE, ALUMINUM, SIZE AS SHOWN, W/ SURFACE MOUNT KIT, FOR SIDE WALL MOUNTING. SPECIFIED PRODUCT: EH PRICE 600 SERIES.
4. TYPE 'C': ALUMINUM DOOR GRILLE, SIZE AS SHOWN, W/ BORDER ON BOTH SIDES. SPECIFIED PRODUCT: EH PRICE ATG SERIES.

NATURAL GAS SYSTEM

1. PROVIDE MODIFICATION TO EXISTING NATURAL GAS SYSTEM TO CSA REQUIREMENTS INCLUDING SEAMLESS BLACK STEEL PIPING, SCHEDULE 40, TO ASTM A53, FITTINGS, SHUT-OFF VALVES, PRESSURE REDUCING VALVES, PRESSURE RELIEF VALVES, ISOLATION COCKS, DRIP AND DIRT POCKETS, AND HARDWARE AND SUPPORTS.
2. FITTINGS:
   .1 2" AND SMALLER: MALLEABLE IRON, THREADED TO ANSI STANDARD B16.3
   .2 CARBON STEEL 'PRESS-FIT' FITTINGS CAN BE USED AS AN ALTERNATIVE FOR BOTH STANDARD & HIGH PRESSURE APPLICATIONS. SPECIFIED PRODUCT: VIEGA MEGAPRESS G OR EQUIVALENT
3. GAS VALVES: CHROME PLATED BRASS, TWO PIECE FULL BORE PAD LOCKABLE TO CSA 3.16. SPECIFIED PRODUCT: HATTERESLEY - MILLIKEN MODEL PB-500.
4. GAS PRV: REDUCE NATURAL GAS TO REQUIRED UNIT PRESSURE WITH PRESSURE REDUCING VALVE. PRV TO PROVIDE 100% SAFETY RELIEF ON EXCESS PRESSURE ABOVE CONTROL SETTING. SPECIFIED PRODUCT: FISHER.
5. PROVIDE NATURAL GAS PIPING AS INDICATED TO ALL GAS FIRED EQUIPMENT. CONFORM TO CSA B149.1 AND ALL SUPPLEMENTARY REGULATIONS.
6. PERFORM ALL TESTS IN CONFORMANCE WITH ONTARIO GAS UTILIZATION REGULATIONS.
7. PIPING TO BE PROTECTED AGAINST CORROSION. COAT WITH TWO APPLICATIONS OF PAINT TO CGSB 1-GP-60M IN PRIMARY YELLOW COLOUR.
8. PROVIDE ALL REQUIRED GAS TRAINS FOR EQUIPMENT. PIPE VENTS TO ATMOSPHERE.
9. PROVIDE APPROPRIATE SQUARE HEAD OR FLAT HEAD WRENCH FOR EACH STOP COCK.

FIRE EXTINGUISHERS.

1. MULTI-PURPOSE DRY CHEMICAL: PRESSURIZED 10LB CAPACITY SUITABLE FOR CLASS A, B, AND C FIRES WITH MOUNTING BRACKETS.

INTEGRITY OF FIRE SEPARATIONS

1. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE INTEGRITY AND FIRE RATING OF ANY FIRE SEPARATION PENETRATED DURING THE COURSE OF THE SCOPE OF WORK DEFINED HEREIN. THIS INCLUDES, BUT IS NOT LIMITED TO, DUCTWORK, PIPING, OTHER MECHANICAL EQUIPMENT, FASTENERS, ETC.
2. DEFINITIONS:
   .1 FIRE SEPARATION - CONSTRUCTED ASSEMBLY THAT ACTS AS A BARRIER AGAINST THE SPREAD OF FIRE.
   .2 FIRESTOPPING - MATERIAL OR COMBINATION OF MATERIALS USED TO RETAIN INTEGRITY OF FIRE-RATED CONSTRUCTION BY MAINTAINING AN EFFECTIVE BARRIER AGAINST THE SPREAD OF FLAME, SMOKE, WATER, AND HOT GASES THROUGH PENETRATIONS IN FIRE RATED ASSEMBLIES.
3. FIRESTOP TESTED SYSTEMS SHALL BE USED WHEN A FIRE SEPARATION IS PENETRATED BY A COMPONENT OF A MECHANICAL OR ELECTRICAL SYSTEM. FIRESTOPPING PRODUCTS SHALL BE CERTIFIED TO CAN/ULC-S115 AND INSTALLED AS PER THE MANUFACTURER'S INSTRUCTIONS. FIRESTOPPING PRODUCTS SHALL MATCH THE FIRE RATING OF THE SEPARATION BEING PENETRATED, AND SHALL BE RATED FOR USE IN THE CONDITIONS AND WITH THE MATERIALS SPECIFIC TO EACH CIRCUMSTANCE.

THERMOSTATS

1. ROOM THERMOSTATS WITH CELSIUS SCALE, SINGLE TEMPERATURE, GRADUAL-ACTING, ADJUSTABLE SENSITIVITY, MINIMUM [<6 DEGREES C> <<10 DEGREES F>>] SET POINT ADJUSTMENT. PROVIDE COVERS WITH CONCEALED SET POINT ADJUSTMENT AND SETPOINT INDICATION WITH THERMOMETER. PROVIDE GUARDS FOR THERMOSTATS IN UNSUPERVISED OR PUBLIC AREAS.
2. REMOTE BULB THERMOSTATS WITH EITHER AVERAGING TYPE ELEMENT OF SUITABLE LENGTH

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FOR AIR OR RIGID BULB FOR LIQUIDS, WITH FLANGES TO SUPPORT ELEMENTS IN DUCTS AND SEPARATE SOCKETS IN LIQUIDS.

VOLUME CONTROL DAMPERS

1. FABRICATE IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE.
2. FABRICATE SPLITTER DAMPERS, SAME GAUGE AS DUCT TO [<600 MM> <<24 INCHES>>] SIZE AND TWO GAUGES HEAVIER FOR LARGER SIZES, WITH [DINGLE] [DOUBLE] THICKNESS SHEET METAL TO STREAMLINE SHAPE, SECURE WITH CONTINUOUS HINGE OR ROD. OPERATE WITH MINIMUM [<6 MM> <<1/4 INCH>>] DIAMETER ROD.
3. FABRICATE SINGLE BLADE DAMPERS FOR DUCTS SIZES TO [<240 X 760 MM> <<9-1/2 X 30 INCH>>].
4. FABRICATE MULTI-BLADE DAMPER OF OPPOSED BLADE PATTERN WITH MAXIMUM BLADE SIZES [<300 X 1825 MM> <<12 X 73 INCH>>]. ASSEMBLE CENTRE AND EDGE CRIMPED BLADES IN PRIME COATED OR GALVANIZED CHANNEL FRAME WITH SUITABLE HARDWARE.
5. EXCEPT IN ROUND DUCTWORK [<300 MM> <<12 INCHES>>] AND SMALLER, PROVIDE END BEARINGS, OIL-IMPREGNATED NYLON OR SINTERED BRONZE.
6. PROVIDE LOCKING, INDICATING QUADRANT REGULATORS ON SINGLE AND MULTI-BLADE DAMPERS. [WHERE ROD LENGTHS EXCEED [<750 MM> <<30 INCHES>>] PROVIDE REGULATOR AT BOTH ENDS.]

FIRE DAMPERS

1. FABRICATE TO NFPA 90A, UL 555, CAN/ULC-S112 AND CAN/ULC-S112.2 AS INDICATED.
2. FUSIBLE LINKS, ULC-S505, SHALL SEPARATE AT [<71 DEGREES C> <<160 DEGREES F>>] [<100 DEGREES C> <<212 DEGREES F>>]. PROVIDE ADJUSTABLE LINK STRAPS FOR COMBINATION FIRE/BALANCING DAMPERS.

FLEXIBLE DUCT CONNECTIONS

1. UL LISTED FIRE-RETARDANT NEOPRENE COATED WOVEN GLASS FIBRE FABRIC TO NFPA 90A, APPROXIMATELY [<75 MM> <<3 INCHES>>] WIDE, CRIMPED INTO METAL EDGING STRIP.

DUCT ACCESS DOORS

1. FABRICATE IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARD METAL AND FLEXIBLE.
2. ACCESS DOORS SMALLER THAN [<300 MM> <<12 INCHES>>] SQUARE MAY BE SECURED WITH SASH LOCKS. ACCESS DOORS WITH SHEET METAL SCREW FASTENERS ARE NOT ACCEPTABLE.

AIR HANDLER UNIT

1. RTU-1

TYPE: GAS-FIRED, HIGH-EFFICIENCY PACKAGED ROOFTOP UNIT W/ DX COOLING COIL. CASING SHALL BE CONSTRUCTED OF ZINC COATED, HEAVY GAUGE, GALVANIZED STEEL. EXTERIOR SURFACE SHALL BE FINISHED WITH WEATHER-RESISTANT BAKED ENAMEL. UNIT SHALL HAVE DIRECT DRIVE, HERMETIC VARIABLE STAGE SCROLL TYPE COMPRESSOR. EVAPORATOR AND CONDENSER COILS SHALL BE COPPER TUBES MECHANICALLY BONDED TO ALUMINUM PLATE FINS. HEATING SECTION SHALL HAVE STAINLESS STEEL HEAT EXCHANGER, INDUCED DRAFT COMBUSTION BLOWER. INDOOR FAN SHALL HAVE VARIABLE SPEED, DIRECT DRIVE MOTORS. OUTDOOR FAN SHALL BE DIRECT-DRIVE, DRAW-THROUGH TYPE. UNIT TO COME WITH REFERENCE ENTHALPY ENONOMIZER WITH BAROMETRIC RELIEF DAMPER.

MULTIPLE ZONE VAV CONTROL SHALL VARY BLOWER SPEED TO MAINTAIN DUCT STATIC PRESSURE SETPOINT. IN COOLING MODE, THE COMPRESSORS & ECONOMIZER SHALL BE MODULATED TO MAINTAIN CONSTANT SUPPLY AIR TEMPERATURE AT DESIRED SETPOINT.

MINIMUM PERFORMANCE REQUIREMENTS:
RTU-1:
RATED AIRFLOW: 2500CFM @ 2" WC E.S.P.
TOTAL COOLING: 60MBH.
HEATING CAPACITY: 140MBH.
OUTDOOR AIR: 287CFM.

SPECIFIED PRODUCT: YORK DIRECT FIT PACKAGED ROOFTOP UNIT.
RTU-1: ZYG06F1, 5-TON, HEATING INPUT 142MBH, HEATING OUTPUT 114MBH
POWER REQUIREMENT: 208V, 1Ø, 60hz, BREAKER SIZE 60AMPS.

2. ALTERNATE PRODUCTS WILL BE CONSIDERED.

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TITLE
HVAC

LOCATION
FITNESS LAB EXPANSION
5536 ANN STREET
MANOTICK, ONTARIO

SIZE	DRAWN BY	DWG NO	CHECKED BY
B	S.N.	M - 5	T.V.
DATE DRAWN	SCALE	SHEET	
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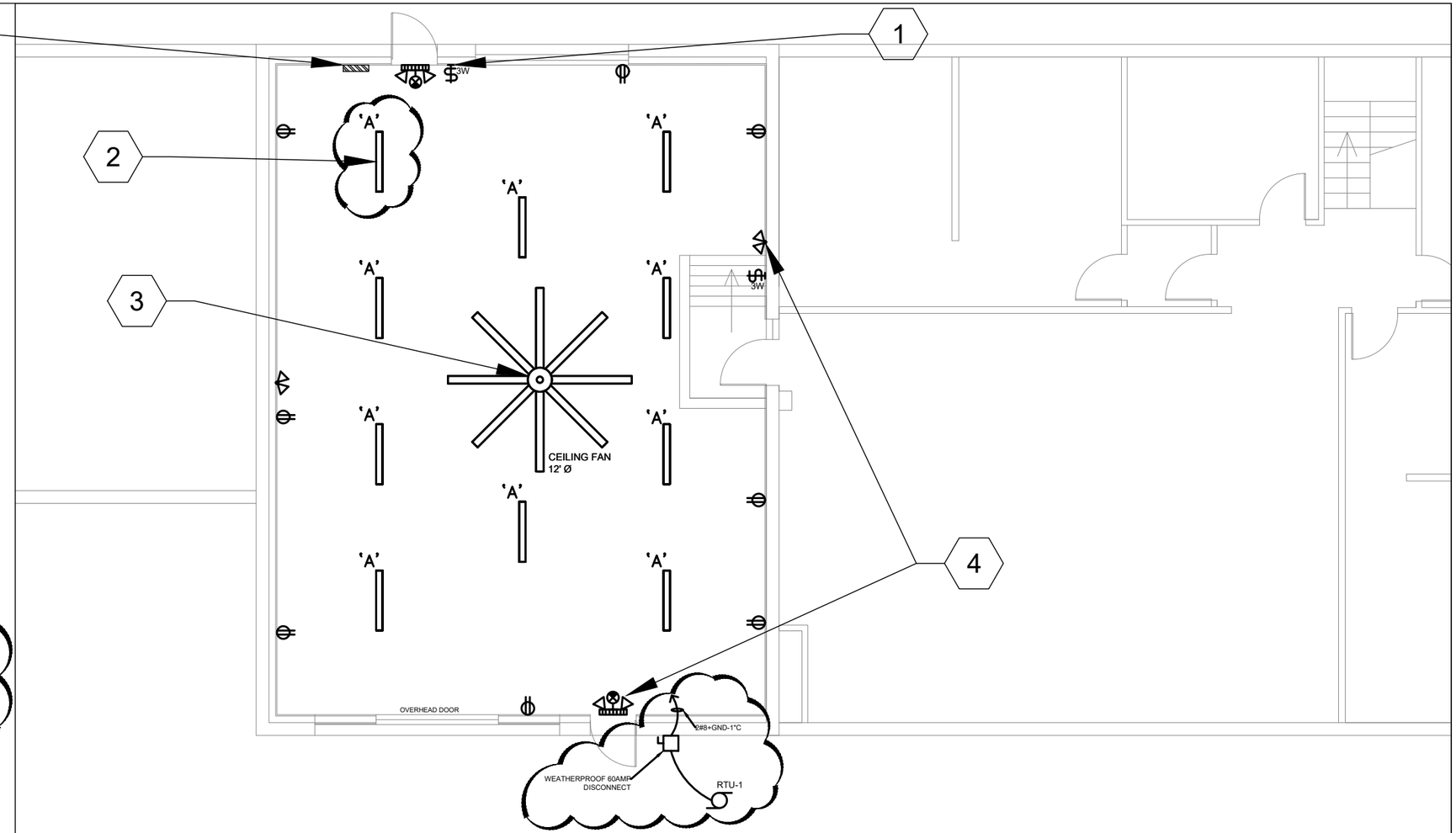

ELECTRICAL LEGEND

NEW/RELOCATED	EXISTING	DESCRIPTION
3W	3W	3-WAY SWITCH
		ELECTRICAL PANEL
		EXIT LIGHT
		EMERGENCY LIGHTING REMOTE HEADS
		EMERGENCY LIGHTING BATTERY UNIT
		125VOLT DUPLEX RECEPTACLE
		COMBINATION UNIT

LIGHT FIXTURE LEGEND

SYMBOL	TYPE
'A'	**LED LINEAR, COME WITH HANGER CHAIN** MANUFACTURER: LITHONIA MODEL #: CLX L48 5000LM SEF WD LM VOLT 35K 80CRI INPUT WATTS : 38.9W

DRAWING NOTES:

1. PROVIDE NEW 3-WAY SWITCH TO POWER LIGHTS. (TYPICAL)
2. PROVIDE NEW SUSPENDED TYPE 'A' LIGHTS. MOUNT 14.5'AFF
3. PROVIDE NEW 12'ø CEILING FAN. USE 10V CAT5 CABLE TO CONNECT CONTROLLER TO SINGLE-GANG JUNCTION BOX. MOUNT FAN AT 14.5'AFF. SPECIFIED FAN: BIG ASS FANS, MODEL-ESSENCE, COMES WITH WIRED WALL CONTROLLER.
4. PROVIDE NEW LIFE SAFETY EQUIPMENT. (TYIPCAL)
5. EXISTING ELECTRICAL PANEL TO REMAIN.
6. PROVIDE POWER TO NEW OUTDOOR UNIT (RTU-1). NEW 60AMP, 2 POLE BREAKER REQUIRED IN EXISTING ELECTRICAL PANEL.

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CONDITIONS AND CONTRACT

1. 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.

2. 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 SPECIALTIES OR MATERIALS.

3. 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.

4. COMPLY WITH STANDARD FOR BUILDING CONSTRUCTION OPERATIONS, ISSUED BY THE ONTARIO FIRE MARSHALL'S OFFICE AND ALL APPLICABLE FIRE SAFETY CODES, LAWS, AND REGULATIONS.

5. 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.

6. 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

1. THIS PROJECT INVOLVES ELECTRICAL INSTALLATION OF NEW BUILDING, EXAMINE THE SITE AND LOCAL CONDITIONS TO DETERMINE THE DIFFICULTIES IN CARRYING OUT THE WORK INDICATED AND SPECIFIED PRIOR TO SUBMITTING FINAL PRICE.

INTENT

1. 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

1. 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. REVIEW ALL DRAWINGS AND SPECIFICATIONS, ARCHITECTURAL, STRUCTURAL, CIVIL, MECHANICAL AND ELECTRICAL. COORDINATE WITH OTHER TRADES IN THE PERFORMANCE OF THE ELECTRICAL WORK AND ALL CONDITIONS THAT WILL EFFECT THAT WORK.

PERMITS, CERTIFICATES, FEES, ETC.

1. 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

1. 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

1. MAINTAIN AT JOB SITE ONE COPY OF EACH OF THE FOLLOWING DOCUMENTS:
   .1 DRAWINGS
   .2 SPECIFICATION
   .3 ADDENDA
   .4 CHANGE ORDERS
   .5 OTHER MODIFICATION TO CONTRACT
   .6 FIELD TEST REPORTS
   .7 MANUFACTURERS' INSTALLATION AND APPLICATION INSTRUCTIONS.

PROGRESS BILLING

1. 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.

2. 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.

3. CONTRACTOR SHALL SUBMIT PROGRESS CLAIMS FOR REVIEW AND PAYMENT AUTHORIZATION IN ACCORDANCE WITH THE TERMS OF THE CONTRACT.

AS-BUILT AND RECORD DRAWINGS

1. A DRAWING 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 A CLEAN SET AND SENT TO THE ENGINEER FOR THE FINAL REVIEW.

2. 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

1. BEFORE FABRICATION OR DELIVERY OF ANY MATERIALS OR EQUIPMENT, SUBMIT A MINIMUM OF FOUR (4) COMPLETE SETS 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

1. 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.

2. 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

1. 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

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

SIGNS

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

EQUIPMENT AND SITE CLEANLINESS

1. 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.

2. 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 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

1. 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

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ENGINEER AND CONTRACTOR. SUBMIT ONE COPY TO THE ENGINEER FOR APPROVAL

MATERIALS

1. 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

1. 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

1. THE CONTRACTOR IS RESPONSIBLE FOR THIS WORK AND SHALL CO-ORDINATE LOCATIONS FOR ALL HOLES FOR PIPES, DUCTS THROUGH FLOORS, WALLS AND ROOF, ETC., AND PROVIDE SLEEVES REQUIRED TO EXECUTE THE INSTALLATION. REIVEW STRUCTURAL WALLS BEFORE CUTTING TO LOCATE EXISTING REBAR AND CONDUITS, AND OBTAIN PROJECT MANAGER'S APPROVAL FOR PROPOSED CUTTING BEFORE PROCEEDING. PROVIDE ULC APPROVED FIRE STOPPING SYSTEM FOR ALL PENETRATIONS THROUGH RATED ASSEMBLIES.

ACCESS DOORS

1. SUPPLY TO THE INSTALLING TRADES, ACCESS DOORS FOR SERVICING EQUIPMENT AND ACCESSORIES OR FOR INSPECTION OF LIFE SAFETY OR OPERATING DEVICES. MATERIAL SHALL BE OF 3mm CORE THICKNESS BONDERIZED STEEL COMPLETE WITH HEAVY DUTY RUST RESISTANT CONCEALED HINGES, POSITIVE LOCKING AND SELF-OPENING SCREW DRIVER LOCK. FRAME SHALL BE 300 X 300mm MINIMUM AND 600 X 600 MAXIMUM AS REQUIRED FOR THE TYPE OF ASSOCIATED WALL OR CEILING CONSTRUCTION. ALL DOORS ARE TO BE ACCURATELY LOCATED TO PROVIDE ACCESSIBILITY FOR NEW EQUIPMENT.

LIFTING OPERATIONS

1. ALL CRANE OR LIFTING OPERATIONS WILL BE CO-ORDINATED WITH, AND APPROVED BY, THE PROJECT MANAGER.

SHUTDOWNS

1. ANY SHUTDOWN THAT MAY BE REQUIRED OF EQUIPMENT AFTER IT HAS BEEN ACCEPTED AS OPERATIONAL. MUST HAVE PRIOR APPROVAL FROM THE PROJECT MANAGER AND ENGINEER. PROVIDE A MINIMUM OF 48 HOURS NOTICE.

MATERIALS REMOVED

1. 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

1. ELECTRICAL INSTALLATION: TO CSA C22.1-12.
2. LIGHTING FIXTURES: TO CSA C22.2 No. 9-96 (2006)
3. FIXTURE BALLAST: TO CSA C22.2 No. 74-96 (R2005)
4. ONTARIO BUILDING CODE-2012.
5. ONTARIO ELECTRICAL SAFETY CODE-2012

MOUNTING HEIGHTS

1. INSTALL ELECTRICAL EQUIPMENT AT FOLLOWING HEIGHTS UNLESS INDICATED OTHERWISE:
   - .1 LOCAL SWITCHES: 1200mm
   - .2 WALL RECEPTACLES:
     - .1 GENERAL: 400mm
     - .1 ABOVE COUNTERS: 175mm
   - .3 PANEL BOARDS: 1800mm FROM TOP
   - .4 TELECOMMUNICATION OUTLETS: 400mm

IDENTIFICATION

1. 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.

2. 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.
3. PROVIDE NEATLY TYPED UPDATED CIRCUIT DIRECTORIES IN A PLASTIC HOLDER ON THE INSIDE DOOR OF NEW PANEL BOARDS, WITH COPY IN MANUAL.

4. IDENTIFY ALL PULL AND JUNCTION BOXES, WITH P-TOUCH LABEL IDENTIFICATION, INDICATING SOURCE PANEL AND CIRCUIT NUMBERS.
5. 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

1. LOCATE OUTLETS AS SHOWN ON DRAWINGS. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF OUTLETS POSITIONED FOR COUNTER LAYOUTS.

2. DO NOT INSTALL OUTLETS BACK-TO-BACK IN WALL; ALLOW MINIMUM 150mm HORIZONTAL CLEARANCE BETWEEN BOXES, AND LOCATE IN SEPARATE STUD CAVITIES WHEREVER POSSIBLE.

3. CHANGE LOCATION OF OUTLETS AT NO EXTRA COST OR CREDIT, PROVIDING DISTANCE DOES NOT EXCEED 3 METERS AND INFORMATION IS GIVEN BEFORE INSTALLATION.

ELECTRIC MOTORS AND WIRING

1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO SUPPLY ALL MOTOR STARTERS, EXCEPT ON PRE-WIRED PACKAGED EQUIPMENT, DISCONNECT SWITCHES FOR ALL MOTORS FOR THE PROJECT, AND ALL WIRING TO STARTERS AND MOTORS EXCEPT WHERE SHOWN OR NOTED OTHERSWISE. EQUIPMENT REQUIRING CONNECTION TO AN ELECTRICAL POWER SOURCE SHALL BE CSA OR HYDRO APPROVED FOR USE AT LOCATION OF INSTALLATION. THE MECHANICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL LOW VOLTAGE CONTROL WIRING WITHIN 'EMT' CONDUIT FOR A COMPLETE AND OPERATING INSTALLATION UNLESS OTHERWISE SPECIFIED.

INTEGRITY OF FIRE SEPARATIONS

1. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE INTEGRITY AND FIRE RATING OF ANY FIRE SEPARATION PENETRATED DURING THE COURSE OF THE SCOPE OF WORK DEFINED HEREIN. THIS INCLUDES, BUT IS NOT LIMITED TO, CONDUIT, RACEWAYS, OTHER ELECTRICAL EQUIPMENT, FASTENERS, ETC.

2. DEFINITIONS:
   - .1 FIRE SEPARATION - CONSTRUCTED ASSEMBLY THAT ACTS AS A BARRIER AGAINST THE SPREAD OF FIRE.
   - .2 FIRESTOPPING - MATERIAL OR COMBINATION OF MATERIALS USED TO RETAIN INTEGRITY OF FIRE-RATED CONSTRUCTION BY MAINTAINING AN EFFECTIVE BARRIER AGAINST THE SPREAD OF FLAME, SMOKE, WATER, AND HOT GASES THROUGH PENETRATIONS IN FIRE RATED ASSEMBLIES.

3. FIRESTOP TESTED SYSTEMS SHALL BE USED WHEN A FIRE SEPARATION IS PENETRATED BY A COMPONENT OF A MECHANICAL OR ELECTRICAL SYSTEM. FIRESTOPPING PRODUCTS SHALL BE CERTIFIED TO CAN/ULC-S115 AND INSTALLED AS PER THE MANUFACTURER'S INSTRUCTIONS. FIRESTOPPING PRODUCTS SHALL MATCH THE FIRE RATING OF THE SEPARATION BEING PENETRATED, AND SHALL BE RATED FOR USE IN THE CONDITIONS AND WITH THE MATERIALS SPECIFIC TO EACH CIRCUMSTANCE.

DEMOLITION

1. EXISTING EQUIPMENT SHOWN AS RELOCATED TO BE CLEANED AND MADE OPERATIONAL BY THIS CONTRACTOR PRIOR TO ITS RELOCATION.

2. ALL ELECTRICAL EQUIPMENT REMOVED AND NOT SLATED FOR REUSE TO BE TURNED OVER TO THE BUILDING OWNER AT A DESIGNATED STORAGE SPACE ON SITE. ALL EQUIPMENT NOT WANTED BY THE OWNER TO BE REMOVED FROM SITE BY THIS CONTRACTOR.

3. ALL ELECTRICAL EQUIPMENT, ELECTRICAL PANEL, BOXES CONDUIT AND WIRING INDICATED FOR REMOVAL THAT WHEN REMOVED INTERRUPTS POWER TO EQUIPMENT INDICATED AS EXISTING TO REMAIN, TO HAVE HOME RUNS REINSTATED TO SUCH EQUIPMENT.

WIRING

1. ALL WIRING TO BE COPPER, RW90 XLPE, STRANDED FOR CONDUCTORS #8 AND LARGER. INSTALL '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.

2. LEAVE ADEQUATE LENGTHS OF WIRE IN JUNCTION BOXES FOR CONNECTIONS TO EQUIPMENT.

3. AC90 WIRING IN HOLLOW WALLS AND CEILING SPACE ONLY.

4. RUN A GREEN INSULATED GROUND WIRE SIZED AS PER CODE IN ALL CONDUIT RUNS. DO NOT RELY ON CONDUIT AS GROUND.

CONDUITS

1. EACH LENGTH OF CONDUIT TO BE NEW AND BEAR CSA STAMP OF APPROVAL.

2. ALL CONDUITS RUN ABOVE THE SUSPENDED CEILING TO BE 'EMT'.

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3. PROVIDE NYLON PULLROPES IN ALL EMPTY CONDUIT RUNS.

4. RUN CONDUITS IN STRAIGHT HORIZONTAL AND VERTICAL LINES FOR ALL EXPOSED CONDUIT INSTALLATIONS.

5. EXPOSED CONDUITS IN SPRINKLERED AREAS TO USE WATERTIGHT CONNECTORS AND COUPLING STANDARD SET SCREW. CONNECTORS AND COUPLING CAN BE USED IN AREAS NOT EXPOSED TO SPRINKLERS SUCH AS ABOVE SUSPENDED CEILINGS.

6. CONDUITS RUN IN CONCRETE ON SLAB ON GRADE MUST BE APPROVED BY STRUCTURAL ENGINEER. CONDUITS WITH OUTSIDE DIAMETERS LARGER THAN 25% OF SLAB MUST BE INSTALLED BELOW SLAB. FOR SLABS 6" OR LESS, ALL CONDUITS SHOULD BE INSTALLED BELOW.

OUTLET BOXES

1. ELECTRO-GALVANIZED STEEL, COATING EQUAL TO THAT TO THE CONDUIT.

2. MINIMUM 37 mm DEEP 100 mm SQUARE OR OCTAGONAL AS REQUIRED.

3. 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

1. PROVIDE PULL BOXES WHERE RUNS EXCEED 30 METERS IN LENGTH AND HAVE MORE THAN 2-90° BENDS.

WIRING DEVICES

1. RECEPTACLES:
   - .1 DUPLEX RECEPTACLES, CSA TYPE 5-15R 125 VOLT, 15A 'U' GROUND WITH FOLLOWING WITH THE FOLLOWING FEATURES:
   - .2 RECEPTACLES OF SPECIFICATION GRADE.
   - .3 RECEPTACLES OF ONE MANUFACTURER THROUGHOUT PROJECT.
   - .4 IVORY UREA MOULDED HOUSING.
   - .5 SUITABLE FOR No. 10 AWG FOR BACK AND SIDE WIRING. SIDE WIRING.
   - .6 BREAK-OFF LINKS FOR USE AS SPLIT RECEPTACLES.
   - .7 EIGHT (8) BACK WIRED ENTRANCES, FOUR(4) SIDE WIRING SCREWS.
   - .8 DOUBLE WIPE CONTACTS AND RIVETED GROUNDING CONTACTS.

2. SWITCHES:
   - .1 TO CSA C22.2 NO. 111-00 (R2005)
   - .2 15A, 347 VOLT SINGLE POLE, 3 WAY SWITCHES, AS INDICATED.
   - .3 MANUALLY OPERATED GENERAL PURPOSE AC SWITCHES WITH THE FOLLOWING FEATURES:
     - .1 TERMINAL HOLES APPROVED FOR NO. 10 AWG WIRE.
     - .2 SILVER ALLOY CONTACTS.
     - .3 UREA OR MELAMINE MOULDING FOR PARTS SUBJECT TO CARBON TRACKING
     - .4 SUITABLE FOR BACK AND SIDE WIRING.
     - .5 IVORY TOGGLE.
   - .4 TOGGLE OPERATED LOCKING FULLY RATED FOR TUNGSTEN FILAMENT AND FLUORESCENT LAMPS, AND UP TO 80% OF RATED CAPACITY OF MOTOR LOADS.
   - .5 SWITCHES OF ONE MANUFACTURER THROUGH OUT.

CIRCUIT BREAKERS

1. PROVIDE CIRCUIT BREAKERS IN PANEL BOARD AS INDICATED.

2. 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.

3. MANUAL MOTOR STARTER RATINGS TO MATCH MOTOR CHARACTERISTICS.

DISCONNECT SWITCH

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

2. UNFUSED OR FUSED AS INDICATED.

3. PROVIDE RAIN-TIGHT CEMA 3R DISCONNECT SWITCHES WHERE INDICATED.

4. DISCONNECT SWITCHES FOR MOTOR ISOLATION TO BE MOUNTED AT MOTOR

EXIT LIGHTS AND EMERGENCY BATTERY UNITS

1. EXIT LIGHTS
   - .1 EXIT SIGNAGE TO NRCAN/ CSA C860-01 REGULATIONS.
   - .2 COMMERCIAL GRADE, THERMOPLASTIC EXIT SIGN. SNAP TOGETHER DESIGN.
   - .3 LED TYPE AC INPUT 120 TO 347 VOLT WITH A 12 VDC SECONDARY.
   - .4 LIFE EXPECTANCY OF THE LEDS TO BE 25 YEARS.
   - .5 GREEN COLOURED PICTOGRAM
   - .6 FACE PLATE TO REMAIN CAPTIVE FOR RELAMPING.
   - .7 UNIVERSAL MOUNTING.
   - .8 ARROW RIGHT, LEFT, BOTH DIRECTIONS AS SHOWN ON DRAWINGS.
   - .9 CEILING OR WALL MOUNTING CANOPY AND MOUNTING PLATE FOR INSTALLATION ON 100mm OCTAGONAL JUNCTION BOX.
   - .10 INSTALL EXIT LIGHTS AS INDICATED, TO REQUIREMENTS OF OBC-2012
   - .11 CONNECT FIXTURES TO DEDICATED EXIT LIGHT CIRCUITS AS INDICATED.
   - .12 STANDARD OF ACCEPTANCE: LUMACELL LP3WU.

2. COMBINATION SELF POWER EXIT AND EMERGENCY BATTERY UNIT
   - .1 INCANDESCENT EMERGENCY LIGHTING UNIT: SELF-CONTAINED EMERGENCY LIGHTING UNIT WITH .2RECHARGEABLE STORAGE BATTERIES, CHARGER, AND LAMPS. BATTERY: 12 VOLT, NICKEL CADMIUM [TYPE, WITH -HALF (1/2) HOUR CAPACITY TO SUPPLY THE CONNECTED LAMP LOAD.
   - .3 CHARGER: DUAL-RATE CHARGER, CAPABLE OF MAINTAINING THE BATTERY IN A FULL CHARGE STATE DURING NORMAL CONDITIONS, AND CAPABLE OF RECHARGING DISCHARGED BATTERY TO FULL CHARGED WITHIN TWELVE (12) HOURS.
   - .4 LAMPS: 12 WATT MINIMUM, SEALED BEAM TYPE IN WHITE STEEL HOUSING.
   - .5 REMOTE HEADS: MATCH LAMPS ON UNIT
   - .6 REMOTE HEADS: MATCH LAMPS ON UNIT
   - .7 INDICATORS: LAMPS INDICATE AC ON, RECHARGING. TEST SWITCH: TRANSFER UNIT FROM NORMAL SUPPLY TO BATTERY SUPPLY
   - .8 ELECTRICAL CONNECTION: 6 FT CORD WITH TYPE 5-15P CAPACITY UNIT AC VOLTAGE: 120 VOLTS
   - .9 UNIVERSAL MOUNTING.
   - .10 GREEN COLOURED PICTOGRAM
   - .11 FACE PLATE TO REMAIN CAPTIVE FOR RELAMPING.
   - .12 ARROW RIGHT, LEFT, BOTH DIRECTIONS AS SHOWN ON DRAWINGS.
   - .13 INSTALL COMBINATION UNITS AT LOCATIONS SHOWN ON DRAWING.
   - .14 CONNECT COMBINATION UNITS TO DEDICATED CIRCUITS AS INDICATED.
   - .15 STANDARD OF ACCEPTANCE: LUMACELL LSC1250WMQ12

3. EMERGENCY BATTERY UNITS
   - .1 STEEL CONSTRUCTION BATTERY UNIT WITH OR WITHOUT EMERGENCY LIGHTING HEADS. 347V AC INPUT - 12V DC OUTPUT.
   - .2 10 YEAR LIFE EXPECTANCY
   - .3 CORROSION RESISTANT UNDERCOATING. STANDARD COLOUR WHITE.
   - .4 REMOVABLE FRONT PANEL ALLOWING UNITS TO BE MOUNTED AT CEILING HEIGHT.
   - .5 SOLID STATE PULSE-TYPE CHARGER. CURRENT LIMITED, TEMPERATURE COMPENSATED SHORT CIRCUIT PROOF AND REVERSE-POLARITY PROTECTED.
   - .6 SEALED DUST-PROOF TRANSFER RELAY, TEST SWITCH AND LED INDICATOR LIGHTS.
   - .7 LONG-LIFE, MAINTENANCE-FREE LEAD ACID BATTERY.
   - .8 STANDARD 120/347 V AC INPUT VOLTAGE WITH LINE CORD KIT.
   - .9 CSA 22.2 No. 141 CERTIFIED.
   - .10 REMOTE OR UNIT MOUNTED HEADS 12W QUARTZ HALOGEN. DOUBLE HEADS AT LOCATION SHOWN ON DRAWINGS.
   - .11 STANDARD OF ACCEPTANCE: LUMACELL RGS 12 XX 12.

No.	Issue	Date
4		
3		
2	ADDENDUM #1	JAN 17/20
1	Issued for Permit	Jul. 5/19

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TITLE
HVAC

LOCATION
FITNESS LAB EXPANSION
5536 ANN STREET
MANOTICK, ONTARIO

SIZE	DRAWN BY	DWG NO	CHECKED BY
B	S.N.	E - 4	T.V.

DATE DRAWN	SCALE	SHEET
JUL. 5/19	1:100	