

**ELECTRICAL SPECIFICATION**

Electrical installation shall be in accordance with the current edition of The Canadian Electrical Code, Provincial, Municipal and other codes, rules and regulations.

The Contractor shall include the furnishing of labor, new material, equipment and supplies, and the installation of the electrical system in accordance with the specifications and drawings of the electrical Work as shown on the plans and as specified. Supply and install all devices required for the complete approved system, operating to the complete satisfaction of the Contract Administrator.

Prepare and submit to the proper authorities all necessary permits and pay all fees. Upon completion and before final payment is made, present to Contract Administrator a Certificate of Approval for all electrical Work from the inspection department having jurisdiction.

Electrical installation including electrical equipment supplied, installed or connected shall be tested in the presence of the Contract Administrator on completion of the Work. The Contractor shall visit the site and ascertain that all Work indicated can be carried out without additional cost to the Contract Administrator.

The Contractor shall guarantee the satisfactory operation of all Work and apparatus included and installed under this section of the specification for a period of twelve (12) calendar months after the final acceptance of the complete building.

The Contractor shall be responsible for any damage caused the Contract Administrator or their Subcontractors by improperly carrying out this Contract.

The Contractor shall carefully examine all drawings and specifications relating to the Work to be certain that the Work under this Contract can be satisfactorily carried out and prior to the submission of his Bid, report at once to the Contract Administrator any discrepancies or omissions or otherwise directing the Work of this section or the guarantee of same.

Submit one set of corrected "as-built" papers and one electronic copy, 100% AutoCAD 2004 compatible to the Contract Administrator.

Grounding shall be in accordance with the latest edition of The Canadian Electrical Code.

Panels, boards, motor starters, disconnect switches, etc., shall be properly identified by means of engraved nameplate nomenclature.

Supply and install all motor controls unless noted otherwise on the drawings. Refer to Mechanical drawings for exact location of motors and mechanical equipment. Use motor control equipment on/ or shown on the drawings, supply and install the following:

- Manual motor starters.
- Magnetic motor starters which are not part of package equipment (refer to Mechanical drawings).
- Publication stations.
- Hand-off-auto selector switches.
- Interlock contacts as required for starters.

Enclosures.

Control elements as required for starters.

Time clocks, time switches and photoelectric relays.

Pilot lights for all starters, switches and publication stations.

Conduits shall be electric metallic tubing unless otherwise noted on drawings or unless prohibited by regulations. Conduits in direct contact with earth or in concrete shall be galvanized steel. Conduits shall not be exposed in any area where concealed Work is required without prior written approval.

Outlet, junction and switch boxes shall be galvanized pressed steel of size and type to suit the requirements of each outlet. Outlet boxes shall be accessible.

All wiring shall be in conduit, except that ungrounded cable may be used in stud partitions and for drops to recessed luminaires (max. 4 luminaires per drop).

Wire and cable shall be copper of standard A.M.S. sizes with 600V (50 Degrees C) insulation unless otherwise specified. Polyethylene insulated wire and cables are prohibited by regulations. Aluminum conductors will not be accepted. Minimum wire size shall be # 12 AWG.

Panels/boards shall be factory-assembled custom made of size, type and arrangement as shown on drawing. Circuit breakers shall be bolt-in, moulded-case, thermal and three pole breakers shall have common trip units. Mount a spewer/drain directly behind a plastic shield on the inside of panelboard doors. All distribution equipment to be splash-proof. Minimum fault rating of circuit breakers shall be 22KA S.C.C.C.

Wall-mounted flush switches shall be specification grade 15A,125VAC. White handle, side or back wiring. Mount switches 1200mm above finished floor unless otherwise noted on the drawings.

Duplex receptacles shall be specification grade 15A,125VAC, parallel slot, U-ground, white cover. Duplex receptacles shall be installed on finished floor or 150mm above counter tops unless otherwise noted on the drawings.

Cover plates for flush-mounted receptacles and switches on concealed conduit system shall be stainless steel.

Telephone recovery system shall be in separate and independent conduit system. Emergency lighting shall be in separate conduit system.

Complete entire installation to local telephone utility requirements and satisfaction.

Mount surface-mounted equipment such as panels/boards, telephone cabinets and other electrical equipment on plywood mounting boards, c/w grey enamel finish.

Any cutting and patching in existing walls or floors required for the addition or relocation of electrical equipment shall be the responsibility of the Contractor.

Existing Work:

Contractor shall take into account items which he is responsible for due to the changes and alterations to the existing building and allow for such items that may occur in his tendered price.

The Contractor is to notify the supply utility of all load increases to existing service.

Provide code conforming emergency lighting and exit system. Min. wire size for this system as per manufacturer's recommendations.

The electrical contractor shall relocate outlets at no additional charge if requested prior to the start of the Work. The Contractor shall be responsible for any additional charge if requested by the local authority having jurisdiction.

Electrical installation shall be installed in conformance with the barrier free requirements applicable in the Building Code.

Where luminaires are recessed into insulated ceilings, the electrical contractor is responsible for providing luminaires suitable for that use.

Supply and install all indicated electric heaters, standard watt density to be Chromalox approved equal in accordance with BS. Thermostats to be calibrated in degrees Celsius.

Equipment and material shall be installed in accordance with BS.

Contractor shall submit shop drawings to Contract Administrator for review prior to order of materials. The contractor shall be responsible for the cost of the review and Contractor shall submit a completed C-1 form (from available from Contract Administrator).

Supply and install, wire and connect all luminaires (to be complete with lamps) as indicated. All luminaires exceeding 150V shall be complete with an integral disconnecting means that will simultaneously open all circuit conductors and conductors supplying the luminaire. The disconnecting means shall be in a permanent position and shall be in a permanent manner adjacent to the disconnecting means, identifying the specific purpose. Refer to Canadian Electrical Code rule 30-308(4).

Final connection to all mechanical equipment to be flexible. Option and refer to mechanical shop drawings of mechanical equipment for circuit breaker and wire size.

Adjust circuit breaker and wire size without additional cost to the City.

All existing and new Contract Administrators equipment is to be wired and connected. Supply and install, wire and connect matching receptacle for portable equipment, complete with cord and plug. All equipment shall be installed in accordance with the manufacturer's instructions. All Contract Administrator portable equipment which is non-portable, shall be directly connected via cable type cord matching electrical characteristics as determined by nameplate ratings of equipment. Confirm nameplate characteristics prior to supply.

Contract Administrator is responsible for the supply & installation of all communication wiring, unless otherwise noted.

**HEATING SCHEDULE**

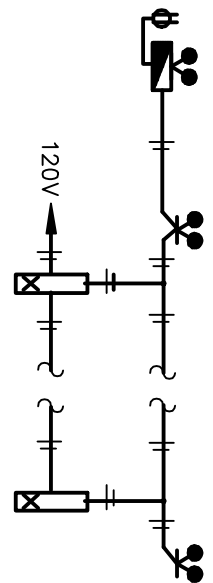
TYPE	WATTS	VOLTAGE	DESCRIPTION	MANUFACTURER	CATALOGUE #	REMARK
C	1000	240V/PH	BASEBOARD	CHROMALOX	BR810W31	NOTE 1
FT15	1500	240V/PH	FORCE FLOW	CHROMALOX	FR1815031	NOTE 1
FT2	2000	240V/PH	FORCE FLOW	CHROMALOX	FR1820031	NOTE 2
FT4	4000	240V/PH	FORCE FLOW	CHROMALOX	FR1840031	NOTE 2

- SPECIFIC HEATING NOTES**
1. C/W BUILT-IN THERMOSTAT OR WIRE TO REMOVE THERMOSTAT AS SHOWN ON DRAWINGS
  2. RECESSED UNLESS OTHERWISE INDICATED. COMPLETE WITH BUILT-IN THERMOSTAT
  3. UNLESS OTHERWISE INDICATED.
  4. (GENERAL) VOLTAGE TO BE AS INDICATED ABOVE UNLESS OTHERWISE NOTED ON DRAWINGS.
  4. (GENERAL) APPROVED EQUAL- QUALITY.

**LUMINAIRE SCHEDULE**

TYPE	DESCRIPTION	CATALOG NUMBER	LAMPS
A	FLUORESCENT DOWNLIGHT RECESSED - C/W DIMMING BALLAST	ROBINSON R367-29	1-1x26/25K/117/4P
B	TRACK LIGHTING - SUSPENDED TRIM GELING C/W 4 HEADS	ROBINSON R142-39	2-4x16/25K/L/4P (4P head)
C	WALL MOUNTED HID INDIRECT	ROBINSON R002-49	1-1x4250W/C/U
D	4' FLUORESCENT - SURFACE MOUNTED	ROBINSON R402-18	2-4x3218/25K/8
E	HID DOWNLIGHT RECESSED IN CANOPY	ROBINSON R400-29	1-1xH70W/L/P/S
F	FLUORESCENT DOWNLIGHT RECESSED IN SLOPED GELING	ROBINSON R401-29	2-4x26/25K/117/4P
G	1X4 FLUORESCENT RECESSED IN DRYWALL	ROBINSON R043-18	2-4x3218/25K/8
H	FLUORESCENT 4' STRIP MOUNTED IN COVE	ROBINSON R044-18	1-4x3218/25K/8
J	FLUORESCENT 12" STRIP MOUNTED IN COVE	ROBINSON R045-18	1-1x18/25K/L/4P
-	LIGHTING CONTROL PANEL	ROBINSON R232-99	-

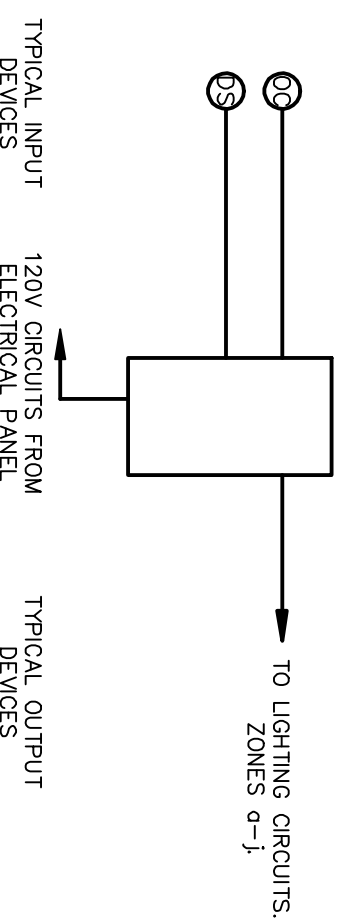
- LUMINAIRE SCHEDULE NOTES:**
1. ALL FLUORESCENT BALLASTS TO BE ELECTRONIC, MB HYDRO "POKER SMART" APPROVED.
  2. ALL FLUORESCENT LAMPS TO BE 3500K & 85 DRX UNLESS OTHERWISE NOTED.



**EMERGENCY LIGHTING AND SIGNAGE**

N.T.S.

1. CONDUCTORS SIZED TO MANUFACTURERS RECOMMENDATIONS.
2. WIRE AND CONNECT DC TO ALL COMPONENTS.
3. PROVIDE 30 MINUTE CAPACITY UNDER FULL LOAD.
4. INTERLOCK WITH NORMAL LIGHTING CIRCUIT TO ACTIVE EMERGENCY LIGHTING UPON LOSS OF NORMAL LIGHTING.



**LIGHTING CONTROL SYSTEM**

N.T.S.

1. WIRE AND INTERCONNECT LIGHTING CONTROL PANEL, INPUT DEVICES AND OUTPUT DEVICES IN ACCORDANCE WITH THE MANUFACTURER AND SUPPLIER'S INSTRUCTIONS.
2. PROVIDE COMPLETE PROGRAMMING AND COMMISSIONING TO CONTRACT ADMINISTRATOR'S SATISFACTION.

**LIGHTING CONTROL MATRIX FOR LIGHTING CONTROL SYSTEM**

ZONE	OC (FRONT)	DS 1 (BACK)	DS 2 (BACK)	TIME CLOCK	PHOTO CELL
a	X	X			
b	X	X			X*
c	X		X		
d	X				
e	X				
f				X	
g					X
h	X				
j					X

\*X INDICATES THAT LIGHTING IN THIS ZONE IS TO BE CONTROLLED BY THIS INPUT DEVICE.  
 \* THIS ZONE ON DURING "OCCUPIED TIME"  
 UNLESS DAYLIGHT SENSOR INDICATES SUFFICIENT LIGHT.

**MOTOR SCHEDULE**

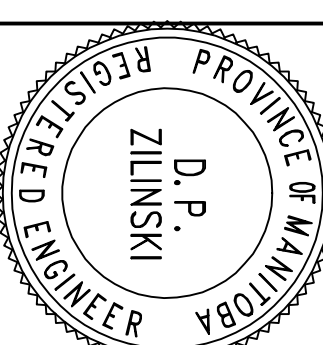
NO.	DESCRIPTION	LOCATION	VOLT-PH.	HP/W/MCA	C.B.	CONO.	STARTER	NOTE
MDA-1	MAKE UP AIR	SEE DRAWING	240V-1PH	24RFA	40A-2P	#8	PACKAGED	NOTE 1
RT-1	ROOFTOP UNIT	SEE DRAWING	240V-1PH	41.3MCA	60A-2P	#6	PACKAGED	NOTE 1
RT-2	ROOFTOP UNIT	SEE DRAWING	240V-1PH	41.3MCA	60A-2P	#6	PACKAGED	NOTE 1
EF-1	EXHAUST FAN	SEE DRAWING	120V-1PH	FRAC	15A-1P	#12	MANUAL	NOTE 1,3

- SPECIFIC NOTES**
1. WIRE AND CONNECT AS REQUIRED. REFER TO MECHANICAL.
  2. MAGNETIC STARTER BY DIV. 16.
  3. MANUAL STARTER BY DIV. 16.

**GENERAL NOTES**

- A. MANUAL STARTERS TO BE C/W OVERCURRENT PROTECTION.
- B. ALL DISCONNECT SWITCHES TO BE SUPPLIED BY DIV. 16.
- C. ELECTRICAL CONTRACTORS TO PROVIDE CIRCUIT BREAKERS AND WIRING ACCORDING TO THE FINAL NAMEPLATES OF ALL THE MECHANICAL EQUIPMENT.
- D. ALL LOW VOLTAGE CONTROL WIRING BY DIV. 15 - REFER TO MECHANICAL SECTION - CO-ORDINATE EXACT REQUIREMENTS WITH DIV. 15.
- E. ALL LINE VOLTAGE CONTROL WIRING BY DIV. 16 - REFER TO MECHANICAL SECTION - CO-ORDINATE EXACT REQUIREMENTS WITH DIV. 15.

**NOVA 3 ENGINEERING LTD.**  
 CONSULTING ENGINEERS  
 291-110 FORT STUBBS  
 WINNIPEG, MB  
 TEL: (204) 942-1775  
 FAX: (204) 942-1776  
 J.N.: 28-156  
 R3C 1C7



678 MAIN STREET WINNIPEG, MB R3B 1E4  
 204 488 3857 tel. 204 488 0216 fax.

www.bridgmancollaborative.ca

bridgmancollaborative ARCHITECTURE

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Project: AMERIC DOW PLANT AND OFFICE BUILDING  
 Drawing Title: ELECTRICAL SPECIFICATION  
 Project Number: 29-116  
 Date: Feb. 17/09  
 Drawn For: Tender  
 Sheet No: E2