

**VANCOUVER ISLAND UNIVERSITY
INTERNATIONAL CENTRE FOR SURGEON STUDIES
NANAIMO, B.C.**

ELECTRICAL SYSTEMS SCHEMATIC DESIGN REPORT

**MMM GROUP / R.A. DUFF & ASSOCIATES (2007) INC.
215-3993 HENNING DRIVE
BURNABY, B.C.
V5C 6P7**

**PHONE: 263-7232
FAX: 263-9141
E-MAIL: BURNABY@MMM.CA
WEBSITE: WWW.MMM.CA**

PROJECT No. 7672

OCTOBER 2008

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16.3	EMERGENCY POWER
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16.1 SITE SERVICES

- .1 600V 200A electrical service to be extended from existing Shellfish Research Building. Conduits to be run to a new interior step down transformer in the Main Electrical Room.
- .2 Telephone and communication wiring will be run to the ICSS building via the existing ductbanks to building 375 with ducts extended to the building from the manholes.

16.2 POWER DISTRIBUTION

- .1 Building power distribution will consist of a 120/208 volt, 3 phase, 4-wire system distributed from the distribution centres to motor control centres and branch circuit panelboards for lighting. Power panels and one lighting panel per floor to be provided, each fed from 120/208V distribution in the Electrical Room. Floor panelboards shall be located within circulation corridor walls. 600-120/208 volt distribution transformer will be located in the Electrical Room to feed the floor panels. Normal power transformers shall be harmonic mitigation type.
- .2 One emergency power panelboard will be provided on each floor for connection of selected lights and equipment requiring emergency power connection. Selected mechanical equipment and life support equipment will be connected to emergency power.
- .3 All distribution feeders will be XLPE RW90 copper in EMT conduit.
- .4 All major distribution equipment will be located within the electrical room.
- .5 Branch circuit panelboards will be 3-phase, 4-wire, solid neutral with bolt-on breakers having a minimum 10,000-amp fault current rating. Each panelboard will have 25% spare breaker capacity.

16.3 EMERGENCY POWER

- .1 An exterior weatherproof enclosed standby emergency generator will be provided, shared with the Shellfish Research Facility.
- .2 Emergency lighting will be provided automatically on failure of normal AC power through selected light fixtures connected to emergency power. Light fixtures shall be linear fluorescent or compact fluorescent. Metal halide fixtures will not be utilized for emergency lighting.
- .3 An automatic transfer switch will be provided in the Shellfish Research Centre, and a separate transformer and distribution section provided feeding panelboards on each floor, as well as selected life support and mechanical equipment.
- .4 Emergency power will be provided for all exit lights.
- .5 Fire alarm, intrusion alarm and telephone panels will be connected to emergency power with battery back up for short term outage coverage.

16.4 BRANCH CIRCUIT WIRING

- .1 All branch circuit wiring will be minimum 12 AWG RW90 XLPE copper. Low voltage wiring will be LVT cable minimum 18 AWG copper.
- .2 EMT conduit will be used for all interior-wiring installations. PVC conduit will be used in all underground wiring installations (separate ground conductor will be provided). EMT conduit fittings will be steel type. Low voltage DDC wiring will be run 'free-air' in ceiling spaces, properly supported. Relaxation from Authorities will be requested to install PVC conduits in humid tank areas.
- .3 Wiring and conduit will be concealed in walls, floors, and ceiling spaces where available. Conduits will be surface mounted in areas of exposed ceilings.
- .4 General purpose power receptacles will be specification grade 5252 type.
- .5 All receptacle, and light switch coverplates will be stainless steel. Communication outlet coverplates will be plastic.
- .6 All branch circuit pullboxes and junction boxes will be identified with circuit numbers. All receptacles to be labelled with panel and circuit number.
- .7 Power receptacles as per program in offices, classrooms and laboratories.
- .8 AC90 (BX) cable will be used for drops to light fixtures. 'Daisy-chaining' of BX between light fixtures will not be permitted. BX vertical drops to receptacles will be permitted.

16.5 MOTOR CONTROL

- .1 Motor starters for HVAC fans, pumps, etc. will be installed where required. Loose motor starters will be located in either mechanical room or at the Life Support or Air Handling Equipment. Smaller fans and motors will be fed from branch circuit panelboards on each floor.
- .2 All disconnect switches used for motors will be heavy-duty type sized to required horsepower rating.
- .3 Starters will be manual or magnetic type with face mounted controls. Auxiliary contacts will be provided with magnetic starters to suit control requirements.
- .4 All fan units shall be interconnected to the fire alarm system to shutdown on fire alarm activation.
- .5 All electrical equipment shall be labelled. Labels shall be reviewed by VIU prior to ordering and installation.

16.6 LIGHTING

- .1 Generally the lighting system will be designed to meet ASHRAE 90.1 lighting requirements for loading and control.
- .2 Lighting systems will maximize energy conservation.
 - a) T-8 32 watt 3500°K lamps in all fluorescent fixtures
 - b) Solid state electronic fluorescent ballast's.
 - c) Compact fluorescent fixtures
 - d) LED type exit fixtures
- .3 All interior/exterior lighting will be 120 volts.
- .4 Lighting levels will be designed to I.E.S. and Ministry of Education minimum recommended levels. Exterior lighting levels will be as per IES and WCB requirements.
- .5 Emergency lighting will be provided throughout all areas of the building.
- .6 Exit signs will be provided in all areas located in accordance with BC Building Code requirements.
- .7 Exterior lighting will consist of a combination of wall mounted fixtures and recessed soffit fixtures. Lighting will be provided over all exterior doors. Fixtures will be provided with vandal resistant lenses.
- .8 Lighting fixture types by area:
 - a) Electrical/Mechanical Service Rooms: Surface mounted / suspended strip fluorescents c/w wireguards.
 - b) Fish Culture and Fish Research Area: Corrosion resistant gasketed 2-lamp or 3-lamp fluorescent fixtures, surface or chain suspended.
 - c) Offices: Recessed 2-lamp 2x4 fluorescent fixture with prismatic acrylic lenses or suspended fluorescent fixtures with wrap around acrylic lenses.
 - d) Public Corridors: Recessed 2-lamp 1x4 fluorescent and compact fluorescent down lights or suspended fluorescent fixtures with wrap around acrylic lenses.
 - e) Main Stair: Direct/indirect linear suspended fluorescent fixtures or wall mounted light fixtures.
 - f) Washrooms: Surface mounted 2-lamp fluorescent fixtures c/w wraparound acrylic lens. Strip fluorescent fixtures installed in Architectural valance.
 - g) Laboratory: 3-lamp 2x4 recessed fluorescent fixtures or pendant suspended direct/indirect 2-lamp fluorescent fixtures.

16.7 LIGHTING CONTROL

- .1 Indoor lighting shall be controlled by low voltage lighting controls located in all rooms.
- .2 Public areas (corridors, etc.), and main student washrooms shall be controlled via 'local' low voltage switches.
- .3 Exterior lighting shall be controlled by time clock and photocell. Manual override switch will be provided for maintenance. Daylight sensor will be provided for the atrium lighting to turn lights off if sufficient natural light is present.
- .4 Laboratories shall be provided with banked switching control.
- .5 Occupancy sensors to be provided for student washrooms and faculty offices to maximize energy savings.
- .6 Photoperiod control will be provided in fish research areas.

16.8 FIRE ALARM

- .1 Fire alarm system will be zoned, microprocessor based system c/w smoke detectors, heat detectors, manual pull stations and be electrically supervised. Fire alarm system will be connected to centralized fire alarm panel. Fire alarm panel will be connected to emergency power in addition to battery backup.
- .2 Full sprinkler system monitoring and mechanical fan control. Flow switches and tamper switches connected to fire alarm panel.
- .3 Fire detectors as per code. Air duct smoke detectors for air handling unit shutdown as required. Manual pull stations located as per BCBC requirements.
- .4 Fire alarm annunciator will be located at firefighter entrance. Annunciator will be graphic style. Fire alarm system main panel will be located in the Main Electrical Room. The fire alarm panel shall be consistent with VIU's campus standard.

16.9 INTRUSION ALARM SYSTEM

- .1 Door contacts provided on exterior doors only. Intrusion alarm panel provided interfaced to campus central monitoring.
- .2 Rough-in and wiring shall be provided for Intrusion/Card Access/CCTV.

16.10 TELEVISION

- .1 Coaxial cable system will be provided throughout the building for video distribution. Cables will be run to local communication closet with riser cables between closets.

16.11 COMMUNICATION SYSTEMS

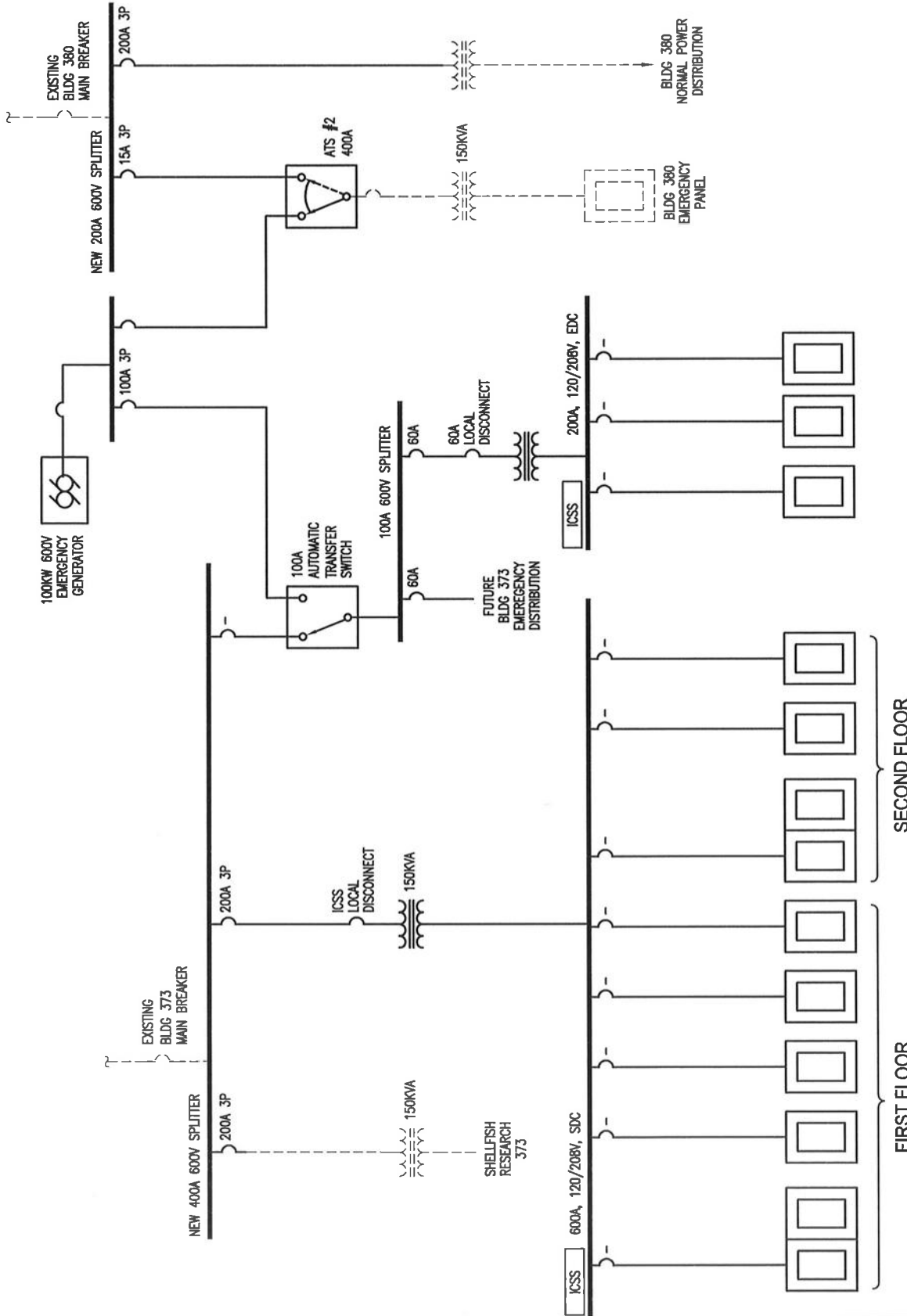
- .1 Telephone, and television services will enter the building via ducts to the Main Electrical Room located on Level 1. Distribution on each floor will be via ceiling space cable tray above circulation corridors.
- .2 Communication Rooms shall have: plywood on all walls, sufficient surge suppressed power receptacles, grounding bus bars connected to building ground system. Basket style cable tray shall be provided around the perimeter of the communication room with 'waterfall' sections provided above proposed rack location.
- .3 Telephone switching equipment will be located in the Main Communication Room. Telephone switching equipment will be connected to campus central telephone switch via fibre optic cable.
- .4 Data/Telephone outlets will be provided in all offices, prep rooms, laboratories, and other areas as required.
- .5 Telephone/modem outlets will be provided for:
 - a) Fax machines/photocopiers
 - b) Computer network modem
- .6 Computer and telephone cabling shall be provided throughout the building from Communications Rooms. Cabling shall be run in cable tray. Communication cabling will be 24 gauge, solid copper, 4 pair twisted, FT-4, category 6. All cabling shall be terminated, tested and certified. Cabling will be terminated in patch panels installed in floor mounted racks. Cabling shall be installed in conduit stubbed to the cable tray.

16.12 MISCELLANEOUS SYSTEMS/EQUIPMENT

1. GENERAL

- .1 Products and procedures specified for fire-stopping conduits penetrating fire separations.
- .2 Seismic restraint of electrical fixtures and equipment.
- .3 15/20 Amp receptacles will be provided in corridors for janitorial equipment.
- .4 Cable tray provided in corridor ceiling space for distribution of communication cabling.
- .5 No provision for audio/visual equipment or teleconferencing systems.

END OF REPORT



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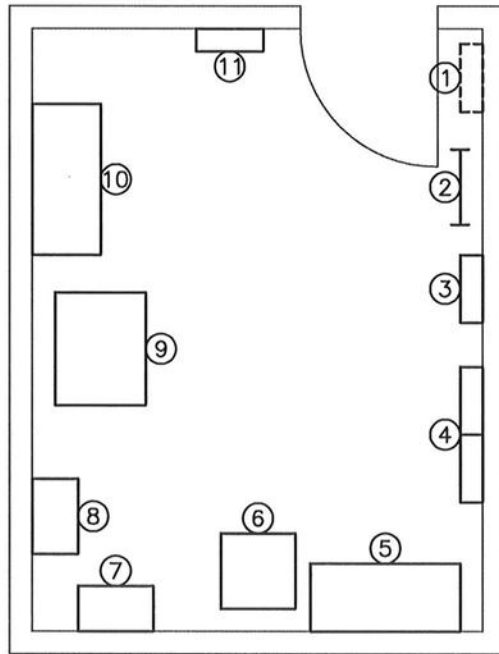
MMM Group Limited.
 R.A. DUFF & ASSOCIATES (2007) INC.
 215 - 3993 Henning Drive,
 Burnaby, BC V5C 6P7
 1.604.283.7232
 www.mmm.ca

**Vancouver Island University
 International Centre for
 Sturgeon Studies
 SINGLE LINE DIAGRAM**

DATE:
OCT.06.08
 JOB #:
7672

SCALE:
 N.T.S.
 CHECKED:
 ATT
 DRAWN:
 TC

DRAWING NO:
ESK-1



EQUIPMENT LIST:

- ① TELEPHONE EQUIPMENT.
- ② COMMUNICATION RACK.
- ③ FIRE ALARM PANEL.
- ④ LIGHTING PANEL.
- ⑤ EDC (EMERGENCY).
- ⑥ STEP DOWN XFMR.
- ⑦ 60A LOCAL DISCONNECT (EMERGENCY).
- ⑧ 200A LOCAL DISCONNECT (NORMAL).
- ⑨ STEP DOWN XFMR.
- ⑩ SDC (NORMAL).
- ⑪ SECURITY PANEL.

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**Vancouver Island University
 International Centre for
 Sturgeon Studies
 MAIN ELECTRICAL ROOM SCHEMATIC LAYOUT**

DATE:
OCT.06.08

JOB #:
7672

SCALE:
N.T.S.

CHECKED:
ATT
 DRAWN:
TC

DRAWING NO:

ESK-2