D 5020 – SERVICES

1. General

The University is a self-accredited corporation under the Safety Codes Act. All electrical work is required to comply with all applicable codes and regulations. The Guidelines are intended to be read in conjunction with the Canadian Electrical Code Part 1 and in no way are to be construed as a replacement for the Canadian Electrical Code.

2. Primary Power Service

The University of Alberta is interconnected with the local commercial Utility and also generates its own power and provides all primary power distribution on campus. Primary power distribution is 13.8 KV and in most areas is distributed via the underground tunnel system. Where primary power is deemed to be desirable for a building project, early dialogue will be required with Utility personnel to establish service entrance points and other related requirements.

Primary power services are provided to building projects where building load exceeds 500 KVA. For major residential towers and other more research driven projects where total building load will be less than 1500 KVA, service will be single ended with one feeder and one transformer.

For larger buildings where total building load will be 1500 kVA and higher and/or where power reliability is more critical two or more primary feeders are provided to double ended substations with main-tie-main configuration.

Fused primary protection is provided within the building and where double ended substations are used. Primary tie switches are incorporated for load transfer and system maintenance.

Primary metering is incorporated in all installations where service to the building is 13.8 KV.

Normally the University Utility provides all primary cabling, primary load breaker switches and primary metering.

Each project will be subject to utility charges associated with Utility work.
3. **Secondary Power service**

For small secondary service type loads (less than 500 KVA) services will be provided via pad mount transformers. Secondary service voltage will be 120/208 volts, 3 phase, 4 wire or 347/600 volts, 3 phase, 4 wire. Confirm with client.

4. **Telephone Services**

The University has a distributed telephone network on Campus with switches located in the following facilities:

(i) General Services Building  
(ii) Rutherford Library  
(iii) Medical Sciences Building (Med Sciences PBX Noted at near capacity)  
(iv) Campus Towers  
(v) Extension Centre (Now known as University Terrace)  
(vi) Faculty St. John (PBX in general office – contact Patrick Thibaudeau)

For new facilities or major renovations the direction for telephone systems is to implement systems with Voice over Internet Protocol (VoIP). This initiative removes the need to reach one of the PBX Sites for telephone connections. Phone and data are carried over the network infrastructure with redundant connectivity to 2 of the U of A's core sites.

For telephone service supply point on any new project contact Facilities Management.  
(AICT-Telecom Services shall be involved in all discussions about new Services. AICT-Telecom Group head is Penny Slevinsky)

5. **Data Services**

The University has a distributed data network with switches/routers located throughout the Campus. Major distribution points are located in the following facilities:

(i) General Services Building  
(ii) Central Academic  
(iii) Mechanical Engineering Building  
(iv) Business Tunnel Site  
(v) Clinical Sciences Building  
(vi) Medical Sciences Building  
(vii) Lister Hall  
(viii) Faculty St. John (IS Aggregation Point that connects back to North Campus via Supernet System / Contact: - Ray Richmond)
(ix) U of A Farm Site (AKA Edmonton Research Station Bldg 59)
(x) Note: The Students Union Building has been eliminated with the deployment of the 10gig Campus Core Network)

For data service supply point on any new project contact Facilities Management. (AICT Data Services shall be involved in all discussions about new Services. AICT-Data Group head is Raymond Richmond).

6. **Cable T.V.**

The University has a single tie-point with Shaw Cable. Campus Cable T.V. distribution is done by the University via the tunnel system.

For Cable T.V. service supply point on any new project contact Facilities Management. (AICT Services shall be involved in all discussions about new Services. AICT Group head for Cable Systems is Darin Bridges).

7. **Site Lighting**

Site lighting on the campus is considered independent from any building project and is serviced from the Utility Tunnel power distribution system.

Site lighting power is provided at 120 or 208 volts derived from step-down transformers and panelboards that are located in the Utility Tunnels and that are controlled by either time or temperature parameters.

Site lighting associated with buildings shall not be supplied from 347V sources.

For Site Lighting contact the U of A Utilities Department and obtain Utilities Design Standards for Site Lighting from David Roh 492-4021.

8. **Grounding**

Electrical grounding requirements for most buildings on campus exceed CEC Part 1 requirements because of the sensitive nature of the equipment housed in and research work being performed in the facilities.

Medical and research buildings will require ground impedance readings of 2.0 ohms or less. Designers shall establish electrical grounding and bonding requirements early in design process for facilities and renovations.

Provide clean ground systems where required by client for special research. Clean grounds to be totally independent of AC ground except at the single tie-point in main electrical room or between the ground grids below grade.
9. Lightning Protection

Lightning protection systems are not mandatory on all University projects; however, systems are required to be incorporated into the design for all tall buildings (higher than 3 storeys). Systems as installed are to be certified by system installer be in compliance with the Alberta Lighting Protection Act. The requirement for record drawings and system testing records for lightning protection systems shall be incorporated into the design documents for projects with lightning protection.

Confirm any project specific requirements with the client early in the design process.

10. Identification

The University of Alberta has developed an identification system for electrical equipment, cabling, and building wiring systems. This information is contained in a separate posted document but shall be incorporated into the design documents for all building projects. Identification systems for tagging electrical systems and equipment shall match the University Standard. (The intent of the requirement is to eliminate differences in equipment identification acronyms, equipment paint finishes, wire tagging systems from being found in renovations and new facilities at each of the University' Campus locations).

1. Painting and Finishes

.1 All electrical fittings, supports, hanger rods, pullboxes, channel frames, conduit racks, outlet boxes, brackets, clamps, etc. are to have galvanized finish or enamel paint finish over corrosion resistant primer.

.2 All panelboards, distribution centres, motor control centres, transformers, and other cabinets to be factory finished in alkyd high gloss enamel applied over corrosion resistant primer. Matte or flat type finish paint not acceptable. Factory finished units that are scratched or marked during installation or shipping to be touched up with matching spray-on air dry lacquer or, if required to provide a satisfactory job, completely refinished.  
- 120/208 Volt Normal: Grey
- 347/600 Volt Normal: Sand Beige
- 120/208 Volt Emergency Power: Grey with labels/lamicoid tagging as indicated elsewhere. Tags shall have Red Face and White Core
- 347/600 Volt Emergency Power: Sand with labels/lamicoid tagging as indicated elsewhere. Tags shall have Red Face and White Core
- 13.8 kV: For Orange Colour with labels/lamicoid tagging as indicated elsewhere - Contact Utilities for Paint Code.
.3 All 347/600 volt equipment including pullboxes and raceways to be finished in sand. All 347/600 volt emergency equipment, including junction and pull boxes pullboxes (greater in size than 5” square), shall also be finished in sand beige. Junction and pull boxes shall have the word “Emerg” printed (for concealed applications) or neatly stencilled or labelled (for surface applications) on the covers. The interiors of surface mounted and recessed boxes and enclosures shall be finished in sand beige. Covers and exterior of surface mounted pull and junction boxes shall be finished in sand beige except where this conflicts with architectural finishes or where stainless steel covers are employed. Colour coding shall be required on all connectors and couplings. For emergency systems the text “Emerg.” shall be printed (above tee-bar) or labelled (exposed) on the raceways at couplings in exposed locations and where the raceway goes into, over or through walls, floors or ceilings. For Teck Cable, Drive Cable, etc. the cable shall be color coded (and as applicable identified with the text “Emerg.”) at every 5 meters along the length of the run. Both raceways and cables will be color coded (and as applicable identified with the text “Emerg.”) both where they enter and exit the aforementioned locations. As well, identification shall be applied at changes of direction.

.4 All 120/208 volt equipment including: junction and pull boxes pullboxes (greater in size than 5” square) to be finished in grey. All 120/208 volt emergency equipment, including: junction and pull boxes pullboxes (greater in size than 5” square), to be finished in grey. Junction and pull boxes shall have the word “Emerg” printed (for concealed applications) or neatly stencilled or labelled (for surface applications) on the covers. Covers and exterior of surface mounted pull and junction boxes shall be finished in grey except where this conflicts with architectural finishes or where stainless steel covers are employed. Colour coding shall NOT be required on all connectors and couplings. For emergency systems the text “Emerg.” shall be printed (above tee-bar) or labelled (exposed) on the raceways at couplings in exposed locations and where the raceway goes into, over or through walls, floors or ceilings. For Teck Cable, Drive Cable, etc. the cable shall be color coded grey (and as applicable identified with the text “Emerg.”) at every 5 meters along the length of the run. Cables will be color coded grey (and as applicable both raceways and cables shall be identified with the text “Emerg.”) both where they enter and exit the aforementioned locations. As well, identification shall be applied at changes of direction.

.5 Transformer enclosures to be finished in accordance with primary voltage colour as outlined above. (See posted electrical color code document for details / for non-standard transformation voltages other colours will be required for transformer enclosure finishes)

.6 Fire alarm system, raceway fittings, pullboxes and junction boxes to be finished in red.
.7 Telephone/Data terminal panels, raceway fittings, pullboxes and junction boxes to be finished in light blue.

.8 Multimedia communications terminal panels, raceway fittings, pull boxes and junction boxes to be finished in yellow.

.9 Clock, program and timing system terminal panels, raceway fittings, pull boxes and junction boxes to be finished in light green.

.10 Low voltage switching terminal cabinets, raceway fittings, pull boxes and junction boxes to be finished in black enamel.

.11 Security, door monitor and access control system, raceway fittings, pull boxes and junction boxes to be finished in rust.

.12 Security television (CCTV) system raceway fittings, pull boxes and junction boxes to be finished in gold.

.13 Television (RFTV / CATV) system cabinets, raceway fittings, pull boxes and junction boxes to be finished in dark-green.

.14 Intercom Systems, cabinets raceway fittings, pull boxes and junction boxes to be finished in medium brown.

.15 Miscellaneous (future) system cabinets, raceway fittings, pullboxes and junction boxes to be finished in pink.

.16 Controls: RCMS, BMS, DDC, BAS Systems raceways pullboxes and junction boxes to be finished in fluorescent orange

(See posted electrical systems color code document for detailed color requirements and other information—note flat or matte finishes shall not be used / non porous low gloss finishes that are easily cleaned are deemed acceptable)

2. Nametags

.1 Clearly identify main distribution centre(s), subdistribution equipment, CDPs, transformers, power panels, lighting panels, dimming system panels, low voltage relay panels, disconnect switches, contactors, motor control centres, motor starters, terminal cabinets, low tension cabinets, data racks, splitters, wireways, junction boxes, On/Off switches, receptacles, and end of line resistors, (and other equipment as required by Code) by permanent labels described below.

For locations in MCCs and CDPs that are the source for VFDs supplemental tagging requirements are identified in the posted VFD specification.
.2 Nametags to be of laminated plastic (3 mm thick), black face/white core (normal power supply) or red face/white core (emergency power supply) with engraved lettering giving white letters on black or red background where called for on the drawings or in the specifications. Letters on nametags to be 9 mm high minimum. 25 mm high letters to be used where outlined. Mechanical fastening using drive rivets or drive pins (no screws) to be used throughout. Identification to be in English only unless otherwise indicated. Nametags for exterior use to be UV stabilized.

.3 In terminal cabinets for control wiring, low voltage relays, television distribution, sound, telephone, fire alarm, clock, etc. identify terminal strips, etc. utilizing machine printed roll adhesive back labels that have the printed text covered by a protective plastic coating. For terminal blocks insert markers shall be installed on the incoming and outbound sides of the terminal blocks.

.4 Sub-Distribution & Branch Circuit Panels: Identify panels as shown on the drawings and indicate voltage. Additionally for CDPs - provide individual lamicoid tags for each of the circuit breakers feeding loads in the CDP. Breaker tags supplying equipment through transformers shall indicate the name of the end equipment as well as the transformer ID. Nametags to be attached to outside of panel door.

.5 Transformers: identify as shown on drawings, and include capacity, primary and secondary voltages. Indicate the load supplied by the transformer per the information shown on drawings.

.6 Disconnect switches, starters and contactors: indicate contactor designation (if provided) and the equipment being controlled, (per the drawings) and voltage.

.7 Terminal cabinets and pullboxes: indicate system, service and operating voltage.

.8 On/Off switches, Dimmers, Low Voltage: indicate areas being served. (Clearly indicate equipment and areas being controlled where not obvious or where more than three dimmers or switches are present).

.9 Distribution Equipment and Sub-Distribution Centres: identify distribution equipment as indicated on drawings and main voltage or voltages if more than one. Identify Main Breaker, CT, PT and Metering Enclosures where present.

.10 Motor Control Centres: identify as shown on drawings and show main voltage or voltages if more than one. Where separate motor control centers are butted together, the top wire way cover on each MCC section shall be provided with a tag identifying what MCC it belongs to. Each cell of the MCC (or standalone starters) shall be tagged to identify the load controlled
.11 Receptacles: For standard 5-15R or T-Slot 5-20RA identify each receptacle providing the panel designation and circuit breaker number as a minimum (ie: 2EA-24) this would designate that the receptacle is fed from Panel 2EA and the circuit number is 24. Tag utilizing machine printed roll adhesive back labels that have the printed text [black ink on white background for normal power / red ink for emergency receptacles] covered by a protective plastic coating. The tags are to be installed so that the label is approximately ½” wider than the cover (both sides) with the excess wrapped around the back of the cover. To prevent mix-up of the tags should painters remove them the circuit number 24 should be written next to the center cover screw (so that it cannot be seen when the receptacle coverplate is installed) For other receptacles provide suitably sized lamicoid nametag white lettering on black background (red background for emergency receptacles) indicating circuit breaker number and panel designation in addition to indicating voltage, phase, amps. Locate on per project instruction.

.12 Fire alarm end-of-line resistors and duct detectors: identify zone numbers with 6 mm white lettering on red background on lamicoid nametag located on wall above device or on the device plate.

.13 Fire alarm monitor/control modules, etc: identify address and device monitored or controlled. Tag utilizing machine printed roll adhesive back labels that have the printed text [black ink on white background] covered by a protective plastic coating. The tags are to be installed so that the label is approximately 5/8” wider than the cover (both sides) with the excess wrapped around the back of the cover.

.14 347 volt lighting switch: Utilize plates for 347V switches that are either impressed or engraved with the text “347V.”

3. Cabinets and Raceway Systems Identification (General)

.1 For low tension systems, equipment enclosures, cabinets, pull boxes and junction (greater in size than 5” square), shall also be finished per the color code schedules. Junction and pull boxes shall have the system acronym printed (for concealed applications) or neatly stencilled or labelled (for surface applications) on the covers. The interiors of surface mounted and recessed boxes and enclosures shall be finished per the color code scheme. Covers and exterior of surface mounted pull and junction boxes shall be finished in the system color except where this conflicts with architectural finishes or where stainless steel covers are employed. Colour coding shall be required on all connectors and couplings. Conduit connectors and couplings shall be identified in exposed locations and/or
above Tee-Bar locations and where the raceway goes into, over or through walls, floors or ceilings. For Teck Cable, Drive Cable, etc. the cable shall be color coded at every 5 meters along the length of the run. Both raceways and cables will be color coded both where they enter and exit the aforementioned locations. As well, identification shall be applied at changes of direction.

.2 Controls conduit systems and junction boxes shall be color coded fluorescent orange.

.3 Colour coding to be as follows:

-120/208 Volt: Grey
-120/208 Volt Emergency: Grey with Text: “Emerg”
-347/600 Volt: Sand
-13.8 kV: Safety Orange (Obtain Utilities Chip)
-Fire Alarm: Red
-Telephone/Data: Light Blue
-Multimedia Communications: Yellow
-Clocks and Classroom Signalling: Light Green
-Low Voltage Relay Control: Black
-Door Monitor & Access Control: Rust
-Security Television: Gold
-Security, Access Control: Rust
-RFTV / CATV: Dark Green
-Intercom Systems: Medium Brown
-480/277 Systems: Maroon Finish
-380/220 Systems: White Finish
-Future (Misc) Systems: Pink

Box Identification

.1 Above Removable Ceilings: in areas where pullboxes, junction boxes, and/or cabinets are located above removable ceilings, finish to be in colour specified both on outside and inside. Coverplates to be painted on both sides in the colour specified. Provide panel and circuit numbers or appropriate low-tension system identification on coverplate with 12 mm letters.

.2 Non-removable Ceilings: where pullboxes, junction boxes, and/or cabinets are located on or in non-removable ceilings, the interior only shall be finished in the colour specified. Interior faces of coverplates to be painted to match box interior finish.
5. Colour Coding of Conductors

.1 Wire Identification Materials: One of the following shall be employed on both ends of conductors used in building wiring systems:

Field Wire Markers
.1 Heat shrink sleeves, (machine printed before field installation)
.2 Clear plastic tape wrap-on strips with white writing section (for black acid pen) with clear plastic wrap-around cover to protect recorded information on the tags. Tag info to be both printed and clearly legible.

Factory Wire Markers
.3 Heat shrink sleeves, machine printed.
.4 Slip-on sleeves, pre-lettered, pre-numbered.

.2 Conductors to be colour coded throughout the building with the same colour applying to the same phase throughout. Colour coding to be by insulation colour or permanently applied colour banding at all distribution centres and panels. Colour coding to be as follows:

- Equipment grounding conductor: green.
- Neutral or Identified conductor: white.
- 120/208 volt phase wires: red, black and blue.
- 120/208 volt emergency phase wires: red, black and blue.
- 347/600 volt phase wires: orange, brown and yellow.
- 347/600 volt emergency phase wires: orange, brown, and yellow.

.3 At all branch circuit panels, pullboxes, wireways, junction boxes, outlet boxes, etc., feeder conductors or branch circuit conductors are to be neatly arranged. Conductors are to be identified as to load fed. At all pullboxes, wireways, junction boxes, outlet boxes, etc. and all device outlet box locations identify each conductor to indicate supply panel and circuit, i.e. Panel 2A circuit 23 – identify 2A-23. Similar to system proposed for power, conductor identification to be provided for all systems at all pullbox, junction box and device locations. Neutral conductor to be tagged with circuit number(s) that it serves.

.4 As applicable in control systems or cabinets with terminal blocks provide supplemental tagging data to identify system circuit, function for terminal block groups, terminal numbers, system number scheme, and polarization data as applicable.

.5 For fire alarm cable and wiring identification/color coding specifics consult Life Safety Systems Group for current information. Fire alarm sub-systems to be colour coded with separate colours used for each of the following sub-systems, bell wiring, detector wiring; auxiliary control wiring; speaker wiring,
etc. Provide wire markers to identify loops, zones, circuits, etc. at each device, junction box, annunciator and panel location.

.6 Lamicoid Nameplates: 3 mm thick plastic engraving sheet, black face, white core, mechanically attached, standard sizes as follows:

.1 Size 1: 12 mm high with 5 mm high letters.
.2 Size 2: 20 mm high with 8 mm high letters.
.3 Size 3: 25 mm high with 12 mm high letters.

.7 Lamicoid nameplates for exterior installations to have UV protection.

6. Equipment Identification Schedule

.1 Identification Materials: Identify equipment and systems using enclosure color and providing the tagging information indicated in the listing below as well as that indicated elsewhere in the Guidelines and Standards Documents. Equipment Identification shall comply with the requirements listed below:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Colour</th>
<th>Nameplate Identification Content</th>
<th>Lamicoid Nameplate Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Voltage Equipment</td>
<td>Voltage Colour</td>
<td>Building name, consulting engineer, date installed, amperage, voltage, interrupting capacity</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Main breaker metering cabinet</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Instrument transformer enclosure</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Loads controlled by each overcurrent protective device</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Metering devices and bussing mnemonics</td>
<td></td>
</tr>
<tr>
<td>Main Distribution Centre(s)</td>
<td>Voltage Colour</td>
<td>Building name, consulting engineer, date installed, amperage, voltage, interrupting capacity</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Main breaker metering cabinet</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Instrument transformer enclosure</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Loads controlled by each overcurrent protective device</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Metering devices and bussing mnemonics</td>
<td></td>
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<tr>
<td>Equipment</td>
<td>Colour</td>
<td>Nameplate Identification Content</td>
<td>Lamicoid Nameplate Size</td>
</tr>
<tr>
<td>-----------------------------------</td>
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</tr>
<tr>
<td>Distribution Centre(s)</td>
<td>Voltage Colour</td>
<td>– Distribution centre designation, amperage, voltage, interrupting capacity&lt;br&gt;– Loads controlled by each overcurrent protective device</td>
<td>2</td>
</tr>
<tr>
<td>Bus Duct Tap Boxes</td>
<td>Voltage Colour</td>
<td>– Tap box designation&lt;br&gt;– Loads controlled by each overcurrent protective device</td>
<td>2</td>
</tr>
<tr>
<td>Panelboards</td>
<td>Voltage Colour</td>
<td>– Panelboard designation&lt;br&gt;– Voltage, number of phases, interrupting capacity</td>
<td>2</td>
</tr>
<tr>
<td>Motor Control Centre</td>
<td>Voltage Colour</td>
<td>– M.C.C. designation, amperage and voltage, interrupting capacity&lt;br&gt;– Motors or loads controlled by each unit and bussing mnemonics&lt;br&gt;– Relay, Control &amp; Incoming Terminal Sections&lt;br&gt;– Panel and Transformer Sections&lt;br&gt;– Spare and Space Compartments</td>
<td>2&lt;br&gt;1&lt;br&gt;1&lt;br&gt;1&lt;br&gt;1</td>
</tr>
<tr>
<td>Manual Motor Starters</td>
<td>N/A</td>
<td>– Load controlled, panel and circuit number</td>
<td>1</td>
</tr>
<tr>
<td>Ground Bus</td>
<td>N/A</td>
<td>– System Ground, Scientific, Instrument Ground or HF Ground use.&lt;br&gt;– Identify source and terminus on #6 AWG wire and up wires</td>
<td>1&lt;br&gt;1</td>
</tr>
<tr>
<td>On/Off Switches</td>
<td>N/A</td>
<td>– Load or Area controlled</td>
<td>1</td>
</tr>
<tr>
<td>Disconnect Switches, Magnetic Motor Starters and Contactors</td>
<td>Voltage Colour</td>
<td>– Voltage and equipment controlled and mnemonics&lt;br&gt;– Note: Text shall match Mech Systems ID Standards</td>
<td>2&lt;br&gt;2</td>
</tr>
<tr>
<td>Transformers</td>
<td>Voltage Colour</td>
<td>– Transformer designation, capacity, secondary and primary voltages and load supplied</td>
<td>2</td>
</tr>
</tbody>
</table>
11. Service Rooms

1. General

.1 All major buildings to have dedicated service rooms for electrical equipment. Separate rooms are required for 15Kv switchgear and associated power transformers. No other non-utilities department distribution, networking or communication equipment shall be contained in the high voltage rooms other than that required for the functions called for to support the 15 kV systems, their operation and maintenance. Clearances shall comply with CSA-Z462 Standard. Rooms housing 15Kv switchgear to have 3 hr fire rating or pre-action dry sprinkler systems with double interlock sprinkler fill/release protection. Separately locate low voltage distribution equipment fro 15kV equipment. 347/600 volt and 120/208 volt secondary distribution may utilize common rooms with other building services however required equipment clearance to be maintained at all times. (Exception where double ended 600V distribution is employed (main-tie-main configuration is being utilized Utilities may permit, at its discretion, having the 600V motorized ACB circuit breakers to be installed in the same space as the 15kV equipment).

.2 Communication system rooms for voice/data and other related communication systems to be separate from electrical rooms and so positioned in the project that 90m cable length is not exceeded on any horizontal data run on a given floor.

.3 All communication rooms to have at least one wall with 19mm G1S plywood backing for equipment mounting and termination painted grey.
.4 All communications rooms are to be equipped with smoke detectors. Service rooms containing electrical distribution equipment or 15kV switchgear shall similarly be equipped with smoke detectors.

.5 All service rooms to have conduit provision for telephone connection as a minimum – other guidelines and AICT requirements will govern cabling, jacking and activation.

.6 All receptacles in communication rooms to be surge suppression type and half of the duplex receptacles connected to standby (emergency) power.

.7 All service rooms to have at least one duplex receptacle on standby power and one receptacle on normal power.

.8 All service rooms (electrical and communications) to have a ground bus.

.9 Cooling to be provided by Division 15 in all service rooms where room temperatures will exceed 30°C from equipment generated heat within the room.

.10 Emergency lighting to be provided in all service rooms larger than 10m².

.11 Battery operated emergency lighting units are to be provided in the following rooms:
   i. Main Electrical Room(s)
   ii. Emergency Generator Room(s)
   iii. Main Mechanical Room(s)

12. Commissioning

The University of Alberta has instituted a commissioning program on all new building projects.

In Typical Division 16 documents this is referenced as Section 16070 – Electrical Starting and Testing – General Requirements. The University has copies of front end and commissioning specifications posted. These are available online. Additionally the University VFD specification contains extensive requirements for commissioning of variable speed drives and associate controls for installations on the University campus.

Project specifications should ensure that the posted commissioning requirements, as applicable, are incorporated. Review Web based Standards and Guidelines information and review requirements note under the heading “Commissioning – General Requirements”. Additional commissioning requirements may be required on a project by project basis beyond what is indicated in the Guidelines and Standards. These may be mandated by LEED or other standards and codes.

END OF SECTION