

Electrical Engineering - Capital Project Design Checklist

Project Name:		 UNIVERSITY OF SASKATCHEWAN	Project Number:	
Design Stage:	66% Review		Consultant:	
Usask PM:			Usask Engineer:	

This checklist reflects the information found within the Usask Mechanical Design Guidelines, along with other pertinent design elements that must be complete at the current design stage. Usask Engineering will use this checklist to confirm all elements of the design below are included in the current package. The design package will be rejected if any applicable element in the list below is not included without adequate justification. It is the Consultant's responsibility to ensure all information is included. The Consultant is responsible for any delays in the project due to resubmissions and supplemental reviews required to satisfy USask requirements.

This checklist assumes all items included on previous design checklists have been included and are already shown on the drawings.

No.	Requirement	Consultant - Is Design Compliant? (Y/N)	Consultant - Deviations requests/comments	Usask Engineering - Is design acceptable? (Y/N)
SECTION 26 - ELECTRICAL				
1	Protection Single Line Diagram Shown on plans.			
1a	Generator interface panel: Capacity size to match emergency standby generator size. Refer to USask standard detail for more information. Confirm detail with Electrical Engineering Department.			
2	General layouts are shown - lighting, power, distribution, etc.			
2a	Conduit shall not be embedded in concrete. Conduits shall be either surface mounted or concealed in wall and ceiling spaces. No metallic conduit is acceptable below slab on grade or otherwise in contact with ground water. Use Schedule 40 PVC conduit for underground conduit larger than 50 mm. All conduit runs shall contain a bonding wire.			
2b	Wire basket trays shall not be used on campus.			
2c	Lighting design should aim to avoid the cold, stark effect of many contemporary lighting installations used in work areas.			
2d	When locating the fixtures the problems of lamp replacement should be considered. Gymnasiums and other large, high spaces should have catwalks so as to avoid the requirements of lifts or scaffolding for maintenance and lamp replacement. In atriums, fixtures should be so placed that scaffolding or the use of pogo sticks are not required. Place fixtures at a more accessible level.			
2e	The variety of lamp types required should be no greater than necessary, and unless special circumstances warrant otherwise, should be restricted to the common types and sizes. Storage space in the caretaker's closets should be designed to suit the types and quantities of lamps to be used.			
2f	LED lighting standard: 2 x 2 fixtures with 4100K color temperature and CRI of 80 or better.			
2g	New lighting shall be 120V for all types. Dimming LED drivers should be continuous (0 – 10 VDC) or bi-level. Renovated areas in existing buildings shall have all 347V lighting removed and replaced.			
2h	Provide locally switched LED lighting in mechanical duct systems, at filter locations and near mechanical units where frequent maintenance will occur. Must be rated for enclosed fixtures.			
2i	Provide LED lighting in crawl spaces.			
3	Controls/wiring shown on plans.			

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4	Lighting levels have been calculated and meet Usask Guidelines.			
4a	Confirm lighting levels meet illumination table provided in Usask Design Guidelines.			
4b	Standard incandescent lighting is not permitted. Special use incandescent lamps should be kept to a minimum and used only where other lighting technology is not available.			
5	Details are shown on drawings.			
5a	Receptacles shall be mounted at a height of 450mm above finished floor, except in work areas			
6	Power distribution shown on plans.			
6a	Motor control centres shall be used to house starters and control circuits with the exception of manual starters which shall be located adjacent to the motor which it serves. Motors larger than 3/4hp shall be three phase and 600 V. For motors 15hp and larger consideration should be given to provide soft-start starters or variable frequency drives. The choice of starter is to be justified by duty-cycle and power system stability. Motor numbering is to be obtained from USask.			
6b	Variable frequency drives shall be used where reduced operating and maintenance costs can be realized. Drives shall be separately enclosed and located adjacent to the motor it serves. Drives up to 15 hp shall be allowed to be installed in MCC enclosures.			
7	Panel schedules are populated and shown on plans.			
7a	Design system for 50% future load growth.			
7b	Do not exceed 70% fill on panels feeding lighting and office areas. Do not exceed 60% fill on			
7c	No more than four receptacles should be on one 15A circuit.			
7d	In computer and other labs no more than three (3) receptacles should be on one circuit.			
8	Emergency/normal power noted on plans.			
8a	Generators will be 600V/3ph/3 wire. 4 wire may be required to suit existing building demands.			
8b	Size for 50% future growth.			
8c	Theatres with tiered seating, some wet labs, and fume hoods should all have emergency lighting. Emergency lighting in entrances, corridors, stairwells and washrooms should be unswitched. Fume hood lighting may be switched. Multi-occupancy washrooms shall be equipped with an emergency light.			
9	Metering/submetering shown on plans and schematics.			
9a	The power supply to the building shall be metered using revenue-approved 3-element, demand energy type meters with test switches. Metering shall satisfy Measurements Canada requirements where tenant is responsible for electrical utility costs.			
10	Power density calculations completed, provided to Usask for review.			
11	Load analysis calculations completed, provided to Usask for review.			
12	Fire Alarm Devices located on plans.			
13	Fire Alarm riser schematic on plans.			
14	Fire Alarm details shown on drawings.			
15	Computer Networks - Cable trays and distribution shown on plans.			
16	Computer Networks - Riser Diagrams shown on plans.			
16a	All network connection labels must be shown on consultant drawings.			
17	AV infrastructure must be shown on consultant drawings.			

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SPECIFICATIONS				
18	Full Table of Contents Provided			
19	Specialty Items Specifications Complete			
20	Base Specifications Included for Review			