APPENDIX 3 - UNSW CONTROL SYSTEM STANDARDS

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UNSW CONTROL SYSTEM STANDARDS
HVAC
Guidance Notes

TECHNICAL DOCUMENT

Prepared By:
University of NSW
FACILITIES - ENGINEERING SERVICES

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Design And Construct Requirements (Rev 4.1)
1 INTRODUCTION

1.1 BACKGROUND
The Control system standard drawings and Generic Control Diagrams have been developed by the UNSW to provide a consistency of design standard.
The Standards provide a minimum standard of functionality that shall be incorporated into new or upgraded control systems.
Designers must address the design for specific installations and inform the UNSW if a lower standard of control or monitoring is proposed.
The Control drawings and logic diagrams are not intended to be used as wiring diagrams or as design or construction documents.
The Standards are not intended to be used for tender or as a design specification without amendment.

1.2 DOCUMENTS
The attached Drawing List and Status provides a schedule of all available drawings and drawing Issue Status.

1.3 GENERAL COMMENTS
Each of the Control Standards drawings comprise of four main sections as indicated in the diagram (Diagram 1) below of a Split System Air Conditioning System, which is used as an example.
These are :
1. Generic Logic Diagram
2. System Schematic diagram
3. Control System Schedule
4. Control System Equipment Schedule
In most cases all four components of the drawing are contained on one A3 sheet, however for larger systems, the components are on two or more A3 sheets.
Control Standards for larger systems such as the chilled water system schematic are contained on A1 drawing size sheets.
Below is a more detailed description of each component of the Control Standard Drawings.

1.4 SYSTEM SCHEMATIC
The System Schematic diagram is a schematic representation of the system for which the Control Standard is applicable. The System Schematic shows the main components of the system and the schematic location of the main control system elements.
The Control Standard shows the minimum elements required for a typical system of this type.
The Schematic is a typical arrangement of components for a system, and is not intended to specify the actual location of control components for all systems of this type.

Design And Construct Requirements (Rev 4.1)
For example, for Split System AC units, the temperature room sensor TT-102 may in some cases be located in the return air duct or plenum in lieu of the Air Conditioned space.

1.5 GENERIC LOGIC DIAGRAM
The Generic Logic Diagram is a ladder logic diagram and represents the minimum functionality of the Control System.
Ladder Logic is a commonly used method for programming control systems such as Programmable Logic Controllers, BACS systems or other programmable controllers.
This method of representing the Control Functionality has been chosen because it is widely used and understood by Control System manufacturers and suppliers and it is not a proprietary programming system.
Ladder logic is one of the most basic methods of representing control systems. It comprises the basic elemental logic components of AND gates, OR gates and TIMERS. Some control system manufacturers provide high level graphical flow chart type programming systems, and these can equally be used to represent Control system

1.6 CONTROL SYSTEM SCHEDULE
The Control System Schedule is a schedule of the main control system monitoring and control items in the system.
The Schedule tabulates the type of Control item (ie whether it is analog or digital) and indicates the required functionality of each control item.
For example a Digital Input is represented as DI and an Analog Input as AI.
Each input and output is allocated a unique number for that Control Standard.

1.7 BACNET MONITORING AND CONTROL
The UNSW has a BACNET compliant network.
The Control Standard nominates the minimum recommended monitoring and control functionality to be provided via the BACNET system.

In the event that the BACNET system is not yet available at a particular site, the Control system should have the functionality to be connected in the future and provide the nominated level of functionality.
DIAGRAM 1: CONTROL STANDARD FOR AN AIR COOLED SPLIT SYSTEM
## DRAWING LIST AND STATUS

### CONTROL SYSTEM STANDARD DRAWINGS

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<td>Fan coil unit DX type with electrical heater</td>
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<td>Fan coil unit with chilled and heating water</td>
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<td>Cooling Tower: Closed circuit (evaporative)</td>
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### Issue Purpose

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Design And Construct Requirements (Rev 4.1)