

MAJOR ASSIGNMENT : APPLIED OR RESEARCH-BASED INVESTIGATION OF ONE BUILDING SERVICE

Background

The unit we are studying this semester covers the variety of building services incorporated in major construction projects, including electrical; mechanical; hydraulic; fire systems; transportation; communication and security. It approaches the subject matter in terms of what might be expected of a manager in the design and construction process. Coordination and integration of these services is vital, both in terms of “buildability” and “life-cycle efficiency” as the project is prepared for handover, then transposes to on-going user satisfaction deliverables.

With Covid19 considerations dictating on-line learning this semester, our major assignment will require independent investigation of one of the services we will be studying. Many of you are employed in the industry and have access to either a currently under-construction project, or to a project in the design stage. Your task will be to investigate and report on characteristics of the service as it applies to that project. The remainder will access recent resources such as journal articles and/or manufacturers data which will detail current and future trends in the provision of that service to new projects or to the refurbishment of existing buildings. Your task will be to report on that service and how it is changing in terms of deliverables.

Method

As indicated in the background statement, the requirements for this assignment depends on either your physical access to an actual project in the design stage or under construction, or those without such access and reliant on published research and/or manufacturers recommendations. Each will require a differing base requirement, but both will concentrate on ONE service only.

In this unit you will quickly grasp the concept that we classify building services into groupings and sub-categorise those groupings into specialities. An example tabulated listing follows. Please note that it is for demonstration purposes and is in no way exhaustive. Nevertheless, it will provide a starting point as you commence this assignment and select your report topic. With justification, you can study a topic outside these classifications but be sure to gain approval before you delve too deeply into your assignment.

Mechanical	AHU (Fans, filters, coils) Ductwork Chillers Cooling towers Heat exchange plates Boilers Chilled beams	Fire protection	Fire hose reels Fire hydrants Sprinklers Detectors EWIS
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Electrical	Sub-stations (Transformers) Main switchboards Sub-boards Wiring systems Lighting systems Emergency power generation Co-generation UPS	Transportation	Lifts Escalators/travelators Turntables Document delivery devices BMUs
Hydraulic	Cold water supply Hot water systems Sanitary plumbing/drainage Stormwater systems Gas systems	Security	Access control systems BMCS

Now, looking at the two access scenarios in a little more detail:

1. Those with access to an actual project

The initial decision will be the selection of the service to be studied. Make sure you have approval from those managing the project to undertake the study. It will necessitate access to specification(s), plans, scheduling details (lead times for ordering and sequence on site), on-site photos (if installed and potentially during installation) and if possible, commentary from the Service Engineer and the Site Manager and installation team members.

As an example, if you were to select the **electrical main switchboard** on your project for your study, it would be expected that the specification would be detailed (including the manufacturer); the location on site would be discussed (including the physical area in m² of the room in which it was located); how long the lead-time for manufacture and delivery and any particular idiosyncrasies regarding delivery and placement (such as specialist craning etc); photographic and diagrammatic references included as appropriate. Commentary from personnel involved will be expected. In so doing, aspects of the installation that might be deemed acceptable (or possibly unacceptable) would be stated and recommendations for future installations established. In this regard, whilst the present design and arrangements might suffice, it may be recommended that greater space be provided in the room; or better egress provided; or differing arrangement of cable delivery into or out of the room etc. etc. be established in your report.

2. Those using reference to research and/or manufacturers' literature and recommendations

You will start by undertaking a broad investigation into new or revised services systems that are under investigation or newly introduced into building and construction. If we look at (say) **electrical services** as an example, it might be that you would be interested in alternative ways to provide base-load power to a project. We presently rely on coal fire power in NSW which is distributed from source of generation in The Hunter Valley, via high voltage cabling and transformed to lower voltage for our buildings and facilities. You may be inclined to look at the alternatives such as the various generating systems that are property or estate based. **Cogeneration and trigeneration plants** come to mind and it would be appropriate for a

study on the offerings available at present and the future technologies that are being investigated and trialed. It would be expected that the specifics of the system would be detailed (including the manufacturer); how it would be located (or co-located) on site (including the physical area in m² of the location); how long the lead-time for manufacture and delivery and any particular idiosyncrasies regarding delivery and placement (such as specialist craning etc). Your photographic and diagrammatic references would come from the literature or the manufacturer including appropriate referencing. Commentary would hopefully include recommendations as to the benefits of the system and this would include immediate and the longer-term (life-cycle) benefits.

Marking Criteria

This is a Level 4 unit and consequently it is assumed that students are full familiar with the requirements of report writing and the process of submission via Turnitin. Marking will be in accordance with these standards:

Standards					
Criteria	Excellent [High Distinction]	Very Good [Distinction]	Good [Credit]	Satisfactory [Pass]	Unsatisfactory [Fail]
Marks awarded (maximum 100 which will be multiplied by 0.5 to give you a 50% overall unit contribution)	85 – 100 points	75 – 84 points	65 – 74 points	50 – 64 points	< 50 points
Introduction	Interesting and complex account of the selection of service for study, what is to be addressed, foretaste of originality	As Credit but shows why the service is unique or advanced at this stage of development	Describes service and what is to be studied, including context	Gives enough to tell what the service is but little background	Fails to "set the scene" as to what is being studied
Main body: Presentation of selected service in context (job based) or in development (research based)	As in Distinction, but with originality of own thoughts based on well-supported evidence in practice	In addition to Credit standard, most if not all relevant points on a well-selected service and giving resolution as to why performance has been achieved	More relevant points listing pros and cons but difficulty in making convincing case. Photos and diagrams of good quality and assisting in argument.	Some relevant points in a descriptive list. Little pros and cons. Insufficient or poor photos and diagrams	No specific study of a selected service. Lack of photos and diagrams.
Conclusions and recommendations	Grounded opinion leading to assured conclusions and a surprised or original recommendation	Balanced viewpoints leading to a well-reasoned conclusion and recommendation	Recognition in summary of some of the points but unable to lead to well-reasoned conclusion	Some attempt to conclude on limited pros and cons and hence unconvincing in delivery	Lopsided and/or ill-founded conclusions and no recommendations

Learning Outcomes Addressed

- Interpret building regulations
- Regulatory knowledge
- Communicate professionally within regulatory frameworks
- Recognise environmental connections with built form

In your Zoom sessions in the initial weeks of this unit, there will be ample time to discuss your options so that you optimise your method of study and topic selection.

Assignment weight 50% of marks available in this unit

Due Date By COB Friday 2nd October 2020 (Week 11) and submitted via Turnitin