

WORK EXPERIENCE REPORT

FOR

THE CHARTERED

INSTITUTION OF

BUILDING SERVICES

ENGINEERS

LICENTIATE APPLICATION

CAREER REPORT

Introduction

I started at NPS in July 2000 as a trainee mechanical design engineer on a 2 year contract.

I transferred to a permanent contract in 2002 once I had successfully completed my ONC in Mechanical Engineering at Norwich City College.

I carried on with college but transferred to West Suffolk College in Bury St Edmunds as a member of the Anglian Polytechnic University. I studied an HNC in Building Service Engineering which started in September 2002.

I completed my HNC in July 2004 and carried on to complete my HND in Building Services Engineering in July 2005.

Whilst working and studying over the past couple of years I have become a proud father to my daughter Jasmine and we are soon to celebrate the birth of our second child in January 2006.

Over the past 5 years I have been involved in a number projects.

I started with simple drawing work and surveys and have now progressed through the training I have received both at work and in college to become a competent engineer.

I have learned and still have a lot to learn from my colleagues and over the past years they have given my great support and knowledge of the building services industry.

The following pages describe and detail some of the projects I have worked on and described the tasks I undertake as part of my job in conjunction with competence criteria.

WYMONDHAM HIGH SCHOOL – TWO STOREY CLASSBASE EXTENSION

I was the Mechanical Design Technician on this project, working as part of a design and construction team consisting of Electrical Design Technicians Architects, Architectural Technicians, Quantity Surveyors, Structural Engineers, Main Contractors and Mechanical & Electrical Contractors and the client.

The project was for Norfolk County Council and consisted of designing and building a two storey class-base extension at Wymondham High School in Norfolk, together with a Hall Extension.

The project started in July 2003 and finished in July 2004.

When the project started I researched into our company Archive system and retrieved some previous extensions and alterations information.

The Architect had progressed the class-base extension design and had some proposed building layouts for the team to work from.

I studied the proposed plans and the research material I had gathered and carried out a site survey to confirm the information was true and correct. From this information I could calculate a heat load for the building.

A previous project on this school was to re-boiler part of the school which consisted of bringing in a new gas main to the plant room. The designer anticipated a future development and allowed for space for an additional boiler in the plant room and gas supply.

I carried out my calculations for the heating load for the building and was able to confirm to the project team that the new boiler could be housed in the existing plant room and the heating could be distributed via heating mains in an existing floor duct with minor alterations.

The project design team then changed the allocated plant room into an office.

The project involved me designing the heating system for the class-base and the hall extension together with the hot and cold water supply and ventilation and comfort cooling.

I had to apply to the water and gas authorities for approval of my proposed designs.

I also compile for every project I design a Construction Design Management report (CDM Health & Safety Regulation).

The project team put together a tender package to be sent out to contractors. The Mechanical Tender package I compiled consisted of design drawings showing the proposed heating, hot and cold, ventilation, external services plant room layout/schematic and specification for the project.

The project involved attending design meetings, site meetings, site visits, site investigations, reporting investigations and site visits.

Once the project was being constructed I was involved in overseeing the installation of my design and helping to solve on site problems if and when they occurred.

One problem was the uncovering of some unidentified underground pipes and cables when the site was being prepared for construction.

Myself and my electrical colleague researched into the previous use of the site and carried out a CAT scan of the pipes and cables. We traced the cable back to the main building and the pipe back to a gas pipe run in the sports field and was able to determine it was a redundant power cable and gas supply for mobiles sited here previously.

I carried out site visits to monitor the quality and progress of the installation. These reports would validate invoices requested from the sub contractors throughout the project.

I checked and confirmed the O & M Manuals were complete with the necessary information and that all the test certificates were present and correct.

After the projects were handed over we were involved in a 12 month defect liability period. Within this period we carried out a post project review meeting with all the project team including the client to reflect upon the project.

This is a good exercise to highlight the successes and review the obstacles which we faced in the project.

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HETHERSETT HIGH SCHOOL - CLASS-BASE & HALL EXTENSION.

I am currently involved as the Mechanical design technician on this project.

The project consists of designing a single storey two science class-base and Hall extension.

I have completed two heating designs for this project.

The first one being a convectional LPG fuelled condensing boiler serving under-floor heating and the other being a ground source heat pump.

This is a partnering project where all parties are involved at an early stage in the project by being part of an integrated Partnering Team who holds frequent meetings throughout the design and construction stage of the project.

We are a stage in the project where two designs have been completed and are being priced on the Christmas period 2005, by the partnered contractors.

The alternative energy subject was talked about early in the project.

I compiled a report for the school explaining the merit and demerits of using heat pumps installations. I also put some budget costs against the installation. At the moment the school is mainly heated via oil fired boilers and LPG boilers.

My research highlighted that the gas main in the adjacent road does not have the capacity for the school and would have to be upgraded. It would only be feasible to have a gas supply, which has the capacity of the whole site not just one part and the cost for this upgrade would not benefit the project.

We will review the budget and costing in a view to obtain further grants from the school and the client if necessary as we are keen to use geothermal energy.

My company including myself are also involved in talks with some heat pump manufactures in a view to reduce initial installation costs and one idea which is being thought about is a Leasing option. The client would lease the heat pump from the Manufacturer with complete guarantee and cover this would involve a monthly rent but remove the initial high installation cost.

WICKFORD CHURCH OF ENGLAND INFANT SCHOOL – ESSEX

I am the Mechanical Design Technician on this project working as part of design team to produce designs and oversee the construction of a single storey two class-base extension.

We, the NPS design team were working for Essex County Council on this traditional tendered project.

We were involved in several design team meetings with Essex County Council to approve our designs.

I had to research into the Essex County Council E-Standards. The E-Standards is a Web based library of documents, explaining the standards, expectations and regulations for the design and construction of Essex County Council projects.

This project required me to carrying out the following:

- Site Surveyor of existing plant rooms, heating load, hot and cold water load, existing external services.
- Research into E- Standard so my design will comply.
- Heatloss Calculations.
- Ventilation Calculation.
- Heating Design, Layout and Specification.
- Hot and Cold Water Layout, Design and Specification.
- Toilet Extraction Design, Layout and Specification.
- Plant Room Design, Layout and Specification.
- External Services Calculations, Design, Layout and Specification.
- Application for Water supply and attend site meeting to assist with the application and design process.
- Application for Gas supply alterations and assist ESPO with the application with the proposed design.
- Apply for design approval from Essex Water Authority (received confirmation of acceptance November 2005).
- Attend team meetings.
- Draw up designs on AutoCAD 2006.
- Write specification

The architect designed this single storey class-base extension with a pitch internal ceiling making service distribution a problem.

My original design allowed for the distribution of services to be within the ceiling/roof void. With the pitch in the way I would have had to run the pipe work up at around 40 degrees, levelled it off at high level within the ceiling void and install AAV. I did not like this design at all as it would mean causing a difficult maintenance procedure on the AAV (Automatic air vents).

My only option is to distribute the heating and hot & cold water mains via purpose made floor ducts. The heating mains and hot water pipes run insulated through one duct and the Mains cold water through a separate duct as not to transfer heat.

This project has been put out to tender and is due to start on site in spring 2006.

NORWICH BUS STATION

I was part of the design team for producing and overseeing the installation A New Bus Station in Norwich City Centre.

I had a large input into the design and supervision of this project.

I carried out heatloss calculations using Hevacomp software. I also used Heacomp to design the extraction system. I first carried out long hand calculations to provide a base to check the hevacomp design.

I designed and draw the toilet extraction system, hot and cold water distribution, heating distribution layout and design and the plant room layout.

I oversaw the entire installation of the project from start to finish.

The gas supply design changed several times throughout the construction period of the project, due to architectural changes. It then meant the installation of the gas supply was becoming a critical stage in the programme as we could not fully test installed systems. I carried out negotiations with the gas authority to ensure the supply was installed on time and correctly.

It was an interesting project to work on with the unusual building design and the tight programme.

I had recently learned the concept of a reverse return radiator system and this building was ideal. I used a reverse return system on two floors of the building.

I was involved in site meetings, site visit producing reports, gas and water applications, witnessing the testing of the installed plant.

I checked the Operation and Maintenance manuals to ensure all information was correct and true. I also checked that all the test certificates were in place prior to the handing over of the building.

I carried a final inspection of the building services and compiled a report outlining the defects which need rectifying.

I arranged and carried out a hand over demonstration of the installed plant and equipment to the client. Together with the assistance of the sub contractor and controls engineer we successfully explained and describe all the procedures in relation to the operation and maintenance of the building.

The project is now in it defect liability period.

REPORT WRITING

Some of my task as being a Mechanical Design Technician is writing reports.

The reports I usually carry out on most of projects are as follows:

Feasibility Reports

These reports consist of surveying the existing mechanical services of a building. I then report on the type of the building, what heating systems, hot and cold systems are installed and the capacity of them.

The report concludes with the proposals for the development outlined in the feasibility brief, complete with budget costing to enable project procurement.

Tender Reports

On traditional tendered projects, once the design drawings and specification for a project are complete a tender package is sent out to usually 6 contractors. The tender package consists of a tender breakdown at the back of the mechanical specification, the contending contractor's price for the job, send them back complete with break down of costs.

Once we have received the tenders within the programmes period (usually 4 weeks), we open them and compare the prices.

The tender report consists of reviewing each tender and checking they satisfy the tender criteria. They review each part of the breakdown (plant room services, heating installation, Hot & Cold Water installation, Controls, External Services etc).

They then compare them to each other and conclude with a recommended contractor for the project.

Site Visit Reports

When I visit site to oversee the installation our designs, I write a site visit report.

These consist of reviewing the current stage of the project. Monitoring the installation compared to the design, programme and price of the project.

They report on personal and companies who are working on site.

These reports help to monitor the progress of the project and help validate invoice requests.

WORK EXPERIENCE TRAINER AND SUPERVISOR

Throughout the year my company arrange and offer work experience placement for high school children.

I have the responsibility to organise, train and monitor them throughout their time with us. I am also responsible for there well being when out on site and within the office.

I give them an introduction into what my company does and explain what being a building services engineer involves.

I show them how to use AutoCAD 2005 and start them off on simple drawing skills and then scaling off drawings from paper to CAD.

I have a work experience class-base project ready to which they work on. They draw it up, I then teach them how to carry heat-loss calculations (long hand), radiator sizing, pipe sizing, simple hot and cold water demands and ventilation design. They complete the project by drawing up their designs.

I arrange for them to carry site visits with myself and other colleagues.

The schools have a work experience report book to complete. It researches into the company they are working for and the tasks of a building service engineer. It involves the work experience interviewing the employer. I play the part of the employer and ensure they satisfy their work experience report criteria.

I also attend a meeting with the work experience and their teacher to reflect upon they placement.