

Engineering practice review report



**ASSIGN
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Introduction

I worked for Christie Civil during both of my Internships and received a wide variety of experience during both of these six-month blocks. I worked on several different sites, which included the upgrade of an RTA owned road to the renovation and construction of parts of the Holsworthy Army Barracks.

I found out about Christie Civil through the university-run website I2MS. I applied for the advertised position, as well as many others as soon as they became available online. Although I didn't receive a reply as soon as I would have liked. About 2 and a half months after I applied for the job, I received a phone call and an invitation to have an interview with the companies Sydney manager, Martin Carey. I felt the interview went very well and I was initially happy with my first impressions of the place and the people. One week later I was one of the two successful applicants and began work on the 1st of August 2007.

In the semester before my second internship, I contacted Christie Civil in the hope of obtaining some information about a site I had previously worked on, for a university assignment. It was then when the Project Manager I was talking to, inquired about where I was working for my second internship and invited me to come back and work for them. Since I enjoyed working there, and I felt that I previously hadn't learnt as much as I could have, I decided to return to the company.

About the company

Christie Civil is a medium sized construction company that specializes in civil contracting within the Sydney region. For over 40 years, Christie Civil has

worked as a Quality Endorsed company whose typical scope of works includes:

Foundations (piles, footings, underground structures, shoring and underpinning)

Bulk and detailed Earthworks

Subdivisions (Site clearance, roads and drainage, services)

Concrete Structures (Bridges, water and wastewater treatment tanks, detention tanks)

Integrated Services (mechanical/ electrical/ hydraulics/ utilities)

Retaining Walls

Car parks and Pavements

Environmental Remediation

Christie Civil employs over 35 people including many Civil engineers, Project Managers and Foreman. On a typical site, Christie Civil provides the On Site Over Heads (OSOH) and usually subcontracts skilled labour (such as carpenters, plumbers and electricians) to professional companies with a good reputation and a proven record. The company also often works in conjunction with a labour hire company called Christies People, as both companies were founded by the same person.

First Internship 2007/2008

During my first internship, I worked with Christie Civil for over 6 months between August 2007 and February 2008. Throughout this time, my role varied significantly as the Christie Civil management team placed me in several different positions so that I might gain experience within different aspects of the company (see Figure 1a). The major roles I had are explored below:

Figure 1a)

Site Engineer

As a site engineer I was given the responsibility of preparing and maintaining all of the Quality Assurance (QA) documentation regarding the construction sites to which I was assigned. The QA documents basically provide a system in which to monitor the progress and quality of the construction processes ensuring that it is done in a safe manor, to an acceptable standard.

Regularly I was required to:

Conduct site inductions, which were aimed at highlighting the important safety rules and regulations for anyone new to the site.

Prepare and maintain Safe Work Method Statements (SWMS) which describes the appropriate precautions that must be taken in order expose potential hazards and minimize their risks.

Give toolbox talks to the subcontractors and laborers. These talks outline current safety issues and highlight the appropriate action that is to be taken in order to maintain a safe workplace.

Conduct Safety and Environmental Checklists. These checklists highlight any potential hazards that may have come about during construction. E. g. Excavations greater than 1. 5m that require fencing.

Prepare, maintain and sign off on Inspection and Test Plans.

Record and monitor the location of newly placed concrete batches.

Correspond with the Client

Aid the project manager

Aid the laborers

I was assigned to two main sites during my first internship, the first of these being the construction of a sewerage overflow tank just off Gunnamatta Bay in Cronulla, NSW. This site basically involved the removal of an existing retaining wall, the excavation of the pit for the tank, the construction of the 5m x 3m tank and the restoration of the wall and the surrounding plants. It was only a fairly small, two month job with a budget of about \$300, 000.

The second site I was assigned to on my first internship was a huge multi-million dollar construction and renovation project of the Holsworthy Army Barracks. On this site, several companies were subcontracted to John Holland to complete specific aspects of the job. Christie Civil had the role of

excavating the trenches, laying the storm water pipes and the construction of the roads throughout the site.

Systems Engineer

As a Systems Engineer I was based in the head office, but was regularly required to visit the different sites and conduct Project Review Meetings (PRM's) with the Foreman or Project Managers. The data from these PRM's were collected and collated to form a set of OHS statistics which aim to compare the number of hours worked, with the number of Work Related Incidents (WRI's) and loss time injuries sustained. This allowed the company to gain an overall picture of performance with a focus on Occupational Health and Safety. Also it is a necessary procedure to prove the companies safety records and to build the companies reputation as a safe working company. This is done for the sake of tendering and as documentation in case an authority audits the company.

Estimator

As an estimator I assisted the estimating division in calculating the price of the different jobs for which we were tendering. This involved communicating with the Senior Estimator and referring to several engineering drawings in order to calculate the cost of the processes involved with the different jobs. For example from the engineering drawings we could calculate the approximate volume of material to be excavated. We could then approximate the time this would take for a certain excavator to complete, and then we would get several quotes from our subcontractors in order to compile a competitive tender for the prospective client.

Other

In conjunction with the major positions explored above I also had many other less specific roles within the company. Regularly I was required to drop off tenders, buy tools, conduct dilapidation reports, collect information regarding potential work sites, print and interpret engineering drawings and follow instructions as needed.

Second Internship 2009/2010

After my first Internship I felt that I had not learnt as much as I could have at Christie Civil, hence I took up an offer to return to the company for my second internship. During this time, I worked for 'Christies' for over 7 months between July 2009 and February 2010. As a result of my previous experience, I spent less time learning the ins and outs of my role within the company, but rather, was put out on one of the company's major job sites straight away.

Throughout the course of my second internship I worked on two major sites, the first site involved the upgrade of Hillsborough Rd, a fairly major RTA road located in the heart of Warners Bay near Newcastle. As a site engineer on this particular job I was required to do much of the same work I had done during my first internship, although having a period of about one and a half years away from the company I was fortunate to have another site engineer with me for the first few weeks to remind me of my role. This particular site was unlike any other job I had worked on prior, because the construction client was the RTA. This meant that I was required to read through and understand many RTA specifications to do with the correct process for the

construction of an RTA road, and submit all the testing and evidence that was need to prove to the RTA that the construction complied with the specifications. Specifically, this involved submitting Hold Point Release Forms (See Appendix A), to the RTA at particular stages of the construction process, and waiting for them to approve the quality of particular aspects of the current construction, before we could continue.

Learning Outcomes

The learning outcomes addressed below were chosen because they are not directly looked at elsewhere in the report. Eg. I didn't include the learning outcome about ethics, because it is directly addresses in the Ethics section.

to review past experience, so as to plan and prepare for future workplace participation at a graduate and professional level.

After reviewing both of my internships, and my university experience as a whole, I think that in the immediate future after graduation, I would like to get a job as a design engineer to experience a different side of my profession. An older civil engineer said to me when I first began my degree was that in his experience, the best design engineers are the ones who had worked in construction beforehand, because they know the practical workings of the job and can apply their experience while designing. So I deliberately went about looking for a job a site engineer for my first and second internships. At university I have enjoyed and found satisfying, the design subjects such as concrete design and steel and timber design, and could honestly see myself pursuing that sort of thing as a career. I would

also like to achieve Chartered Professional Engineering Status to further open up opportunities for my career throughout my life.

to refine and develop your approach to securing employment for professional engineering practice

Since both of my internships were in construction, I hope to eventually get into engineering design, where I can incorporate the practical experience gained from working on site with the designs I am required to complete. As a result I have been looking out for, and focusing my attention to companies which are actively involved in both the design and construction aspects of engineering. I could use my construction experience to get into the company, and then hopefully move on to more of a design role within the company.

to extend your knowledge of workplace cultures and organizational behavior

Working in the construction industry, gave me the opportunity to learn about and be amongst two very different workplace cultures. The difference between the cultures on site and in the office is extravagant. Workplace culture in the office was professional which meant we were required to wear pants and a collared shirt. The atmosphere in the office was serious compared to the site as most of the people I worked with in the office were skilled engineers and project managers. In the same way, this was confirmed by the fact that everyone worked in their own office, quietly without fuss. On site however, there was many practical jokes and a lot of swearing. Work was done to keep on schedule, but there wasn't a major push for completion. Most days were relatively stress-free and for the most part everyone got

along. There was no set time for lunch breaks, and sometimes the opportunity to work through lunch and finish early.

to develop a critical basis for understanding principles of management, and of planning and design

Throughout my work experience I have had much more to do with planning and construction rather than design. I have worked closely alongside a few different construction managers. I have seen and helped with much of the work they do and seen what is required of them to get the job done. Similarly I have been assigned to construction projects from their beginning, and have been involved in the initial planning of a job. My work experience also has been complimented with subjects I have studied at university, such as Construction and Engineering Project Management, whereas subjects like Concrete Design and Steel and Timber Design, have introduced me to the foundational concepts behind design, which I hope will someday come into use in the near future during my career.

to develop and demonstrate effective communication skills appropriate to professional engineering

Communication was one of the essential skills I needed in order to complete my job properly. As explored above, working in the different workplace cultures of site and the office, required me to be able to communicate effectively, with different types of people. Typically, when in the office I would be talking to engineers and Project Managers. As a result, the conversations were generally more technically based often referring to specific design specifications and engineering drawings. On site however,

conversations, if about work, were regarding the practical aspects of the construction such as ‘ getting the grader to trim the road base down 20mm’.

to relate the theoretical knowledge gained in your experience to your studies, so as to be able to apply it in your capstone project

During my internships, I found that a lot of the material and engineering knowledge I had gained at university was reinforced through my practical experience. Subjects such as ‘ Surveying’, ‘ Construction’ and ‘ Engineering Project Management’ provided invaluable preparation for what I was to learn while working on construction sites throughout Sydney. Working on site, however, helped me to see the bigger picture of civil engineering and how each stage of the engineering process ... from initial conception, to design and finally construction of a project, is just as important as each other. Other subjects such as ‘ Steel and Timber Design’ and ‘ Concrete Design’ also introduced me to the other side of engineering, which I am yet to experience in a workplace environment. All of this experience will prove to be a great resource to draw from when completing my Capstone.

to identify opportunities to extend your engineering knowledge

Since I have had all of my experience within the construction aspect of Civil Engineering, I would like to initially pursue a career within a design consulting company so I can broaden my experience. I have enjoyed completing subjects such as steel and timber design, and concrete design and would love the challenge of applying the skills I have learnt in those subjects, as well as getting a more detailed understanding of engineering design within the real world. Also I love the idea of residential design, and

hopefully one day with enough experience, I might be able to design my own house.

to develop strategies for collaborative and life-long learning

I have found that one of the most simple and beneficial practices to undertake for lifelong learning are to asking questions. The field of Civil Engineering is so broad, that it is rare to find an engineer that can be an expert at it all. Hence, during my internships, I needed to ask questions, not only to understand what I needed to do as a site engineer, but also to understand the reasons for doing such things like environmental inspection reports, or for using material such as heavily bound road base, as opposed to crushed sandstone, during the construction of roads.

to develop strategies to secure mentoring and to promote team work

While working for Christie Civil, I was basically assigned to assisting one particular project manager on all of his sites. The Project Manager became sort of a mentor to me, as he would be the first person I would contact if I had any questions or issues. In the same way, I have an uncle and a few friends whom are experienced Civil Engineers, and I have often asked for their advice while unsure about particular assignments while at university. During my career, if the company I work for doesn't assign me to a mentor specifically, I would go about seeking someone within the company who would be happy to sit down with me to answer any questions I might have, also I hopefully would still be able to talk to my uncle and civil engineering friends if they work within the same sector of civil engineering.

to reflect on, and constructively review, your colleagues' practice to help them in their academic, professional and personal development

The main place I have been in a position to constructively review colleagues work is at university. As an intern I certainly wasn't in a position to constructively review my Project Managers work, however, I was required to train up another intern, and in doing so I needed to teach him how, and to review the work he had done. In particular, there was one occasion where he completed a 'Project Review Meeting' but it was not done in enough detail, so I had to review it with him, and highlight the main areas of concern before filing the report. At university however I have worked on plenty of group assignments, where I have been required to constructively review members of my groups work. Recently, I found a mistake in one of the other group members work for a computer modeling and design assignment. I went over and gently pointed out the mistake, but it still took further explanation to convince her that she was wrong.

Career Episode Reports

Career Episode Title: Road Extension, Templar Rd Erskine Park

Dates of Career Episode: 01. 11. 09 to 01. 12. 09

Length of Career Episode: 30 days

Competency Element Claimed

This project involved the extension of Templar Rd, Erskine Park further into an industrial area, to accommodate for the increase in traffic to the area as a result of new major industrial developments in the area. My role as a site

engineer was basically to act as a bridge between the office and this site, maintain and upkeep of the QA Documentation, collaborate with the foreman and laborers and liaise with the project manager.

While I was working here, I was regularly required to manage my own time and processes. I often would move between the office and the site to attend meetings, run errands and deliver items of significance such as inspection reports. To make the most out of each day, I would plan my time and route accordingly to avoid peak hour traffic and determine the most efficient way to complete my tasks.

Often during the day, I would be required to cope with change, both in my own daily schedule or in the final design of the project. Sometimes I would be on site and I would get a call from the company manager asking if I could run an errand for him. On one particular occasion, I was asked to drive back to the company office to pick up some important tender documents and drop them off at the Sydney Water head office. I was required to re-adjust my schedule for that day, and prioritize my tasks and complete them accordingly. Similarly, throughout the project there were several design changes. Initially as part of the project we were required to build a large turning bay towards the end of the road, which was designed so large trucks would have easy access in and out of the surrounding industrial warehouses. Just as we were preparing to begin the excavation for this part of the road, the client changed the design and totally removed the turning bay. I was required to adapt and change a lot of the QA documentation such as Inspection Test Plans (ITP's) and the Lot Plans, in order to accommodate for the design change.

On site, I was required to complete surveying and leveling tasks in a timely manner. Due to the nature of the site, the client, Penrith City Council, would send out a senior engineer to inspect the levels of each layer of the road to ensure that we were building the road to the design levels. I was responsible for ensuring these levels were correct before the senior engineer arrived to inspect. I did this by calculating the design levels from the engineering drawings and then using a laser level to check the actual road level. If the actual level did not match the design level I would ask the grader operator to adjust the actual levels appropriately, all before the arrival of the Penrith City Council's Senior Engineer.

C3. 1: Manages Self

C3. 1a

C3. 1e

C3. 1c

Signature of Candidate:

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Candidate's Verifier/s Name:

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Verifier Engineering Qualifications:

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I verify that the above narrative is a true account of the candidate's own work

<https://assignbuster.com/engineering-practice-review-report/>

Verifier Signature:

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Career Episode Title: Hillsborough Rd Upgrade, Warner's Bay (part 1)

Dates of Career Episode: 05. 07. 09 to 20. 08. 09

Length of Career Episode: 45 days

Competency Element Claimed

This project involved the upgrade of Hillsborough Rd, Warner's Bay to coincide and accommodate for the construction of a new shopping complex which serviced the Warner's Bay and greater Newcastle area. As a site engineer on this site I was required to travel up to Newcastle and spend several days a week supervising, and maintaining all the QA Documentation, whilst collaborating with the client to ensure that the road was constructed according to the design.

My role in particular required a lot of communication. I was constantly asking questions, writing emails, sending reports and confirming meetings with my Project Manager, the client and the site foreman. This in itself required me to change the way I communicate, depending on whom I was talking to. For example, there is a very different workplace culture on site with the foreman and laborers on site, compared to the office with the Project Managers and Engineers. I would have to change my approach to communication and language I would use, depending on the context. When talking to my project manager, or the client, I generally would talk with technical terminology, talking about specific aspects of testing such as the ' RTA approved NAASRA

Road Roughness Test’ or I would make reference to specific reports such as ‘ ITP’s (Inspection Test Plan) or ‘ Hold Points’ which were required by the client at the end of the job.

On one particular occasion, I was required to prepare all the site documentation for an external audit conducted by a company called SAI Global. It took about a week to get everything in order, and I was quite nervous because the auditor was basically going to be rating the organization and completeness of the site documentation and hence, my performance as a site engineer. At the end of the audit, the SAI Global representative highlighted only 2 minor areas which could be improved. My Project Manager turned around and shook my hand and said ‘ good job’ and that he was not really concerned about the minor issues. This event helped me to develop and maintain the trust of and confidence of my project manager and the other staff involved, that I was capable of performing to the required standard.

As an Intern working on this site, I came across many new and different materials and processes used to build this road, compared to what I had encountered before. As an RTA road, the material was generally to be of higher quality, with better materials used and significantly more rigorous testing done during construction. As a result I consistently needed to seek answers from internal (my project manager), and the external (the client representative) sources. I asked questions about the benefits of using particular materials (such as Heavily Bound Base, a road base with fly ash and other cement-like properties.)

C3. 2: Works Effectively with People

Signature of Candidate:

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Candidate's Verifier/s Name:

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Verifier Engineering Qualifications:

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I verify that the above narrative is a true account of the candidate's own work

Verifier Signature:

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Career Episode Title: Hillsborough Rd Upgrade, Warner's Bay (part 2)

Dates of Career Episode: 21. 08. 09 to 15. 10. 09

Length of Career Episode: 60 days

Competency Element Claimed

This project involved the upgrade of Hillsborough Rd, Warner's Bay to coincide and accommodate for the construction of a new shopping complex which serviced the Warner's Bay and greater Newcastle area. For the second half of this project I continued working as a site engineer, however as the job neared its conclusion, I was required to focus more on finalizing the official documentation to be submitted to and signed off by the RTA representative.

In order to understand what exactly was required by the RTA, I need to read through, understand and constantly refer to the RTA Road Construction specifications. Whenever I found the specifications to be ambiguous, I contacted the RTA Rep for clarification as to what he actually required, hence I identified the client's needs. These specifications required me to regularly complete and submit ' Hold Point' and ' Witness Point' Forms to the RTA Representative at critical stages of the construction process. On one occasion the ' hold points' were sent back before being signed off because they did not contain enough detail. For example, A hold point form was required to be submitted before the construction of each new layer of the road. On this particular instant I submitted the hold point form outlining that the previously completed layer (e. g. the crushed sandstone) had passed all the geotechnical tests and asking for permission to continue with the next layer. The RTA rep then sent the hold point form back and outlined that I needed to be more specific about the chainages where the crushed sandstone had been tested and passed.

One of the major set of documents I was required to submit to the RTA was the ITP's or Inspection Test Plans. These were Christie Civil Documents that detailed the methods of construction and testing of each construction process throughout the entire job, e. g., Heavily bound base, Storm water, Asphalt etc. It also required the site engineer and client to sign off after each process had been completed. For example, the ITP for the Heavily Bound Base stated the specific type of material to be used, the level of compaction which was to be achieved and the methods of testing among other things. As the job went on, it was my role to sign off on each of the ITP processes once

they had been completed. I then regularly submitted these reports to the client to document the company's progress, before finally submitting the entire completed set of ITP's, along with all of the Hold points and Witness Points, and other required documents, as one complete record of the job.

C3. 5: Maintains customer focus and relationships with clients

Signature of Candidate:

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Candidate's Verifier/s Name:

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Verifier Engineering Qualifications:

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I verify that the above narrative is a true account of the candidate's own work

Verifier Signature:

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Social Responsibility

Social Responsibility has become one of, if not the forefront issue in engineering in the last twenty years. A civil engineer is responsible and accountable to rest of society for designing, engineering and constructing in a way which will not harm or have dire consequences for the surrounding environment and its occupants. During my internships I found that the two

major ways in which Christie Civil work towards a sustainable future is firstly through the prevention of pollution, and secondly through recycling.

On almost every site I went on, there were different measures taken to prevent the pollution of the surrounding areas. While I worked in Cronulla, we temporarily installed a silt boom in the section of the lake nearest to the site. This was to prevent dust and silt and any other form of pollution from the site, from leaking into the natural environment. Similarly, on the Holsworthy site, we temporarily installed small silt filters above all the stormwater drains in the area for the same reason. The use of a water cart to keep the ground moist was a common tool to prevent the spread of dust, whereas every truck (including its wheels) needed to be relatively clean before leaving site, so that any mud or other material on the truck would not get accidentally dropped in public.

In the same way, on the Warners Bay and Erskine Park sites I worked on silt fences were installed around all the storm water drains in the area, so as to prevent dirt and dust and other materials from entering the drain and being spread into the environment. On these sites in particular, Christie Civil hired a bobcat with a sweeper extension to continually sweep the existing road of any debris and excess material carried off by delivery vehicles, to prevent the material being spread into the natural environment.

During my experience, I found that engineers also generally prefer to recycle materials, not only for sustainable reasons, but because it saves money. For example, on the Holsworthy site we were required to construct roads. This involved the detailed excavation, laying and compaction of road base and

then finally the laying and compaction of asphalt. In this instance, on another one of the company's sites, they were getting rid of tonnes of sandstone. Fortunately for us, the sandstone complied with the Australian Standards for a road base. Consequently, the project manager at Holsworthy recycled the sandstone from another site, by re-using it as road base.

Ethical Practice

Ethics is basically the moral code or set of standards to which someone has been shaped as a result of their culture, religion or society. As a result, ethics is a totally subjective concept, in that something that I might consider wrong or inappropriate might be ok for someone else. Nevertheless the seriousness of ethics cannot be underestimated. I believe that ethics is an especially important topic for the civil engineer, as what they do has a direct impact on society as a whole. Thus, the consequences of bad decisions could possibly have huge ramifications. For me personally, my ethical framework has been predominantly shaped by my Christian faith.

One of the major ethical issue I faced while on my internship, involved the project manager and project foreman asking everyone to sign a Safe Work Method Statement which they had changed but dated it as if it was months earlier. The incident arose after an excavator nearly hit some overhead power lines. Upon realizing that this issue had not been highlighted in the Safe Work Method Statement (which should be signed upon induction), the project manager edited the document, including the new issue and re-printed it. He then asked all the laborers and other people involved to sign the SWMS as if it were months earlier, when they signed the original document. In my integrity, I couldn't sign the document and lie about the

date on which it had been signed. Fortunately since the document outlined the process for bulk and detailed excavation, it wasn't too important that I didn't sign it, as I had little to do with the physical work in this area.

On a similar occasion, while I was working on the Hillsborough Rd, Warners Bay site, one of the young laborers was caught by the police, driving a work truck without a licence on a small public ro