2016年1月28日

上午10時04分恢復聆訊

出席人士： 許偉強大律師及鄭欣琪大律師，為外聘律師，代表食水含鉛超標調查委員會

聶心平大律師，由高露雲律師事務所延聘，代表職業訓練局

殷志明大律師，由羅夏信律師事務所延聘，代表香港房屋委員會

陳樂信大律師及羅頌明大律師，由律政司延聘，代表水務署署長

李頌然大律師，由顧增海律師行延聘，代表有利建築有限公司、明合有限公司及伍克明

許佐賓大律師，由的近律師行延聘，代表保華建築營造有限公司

孖士打律師行陳宇文律師，代表瑞安承建有限公司

孖士打律師行梁樂鋒律師，代表中國建築工程（香港）有限公司

職業訓練局第一證人：盧永康（職業訓練局香港專業教育學院（摩理臣山）建造工程系系主任及首席講師））宣誓繼續作供
許偉強先生繼續盤問

問：盧生，早晨。咁就仲有少少問題嘅啫。

但係我哋尋日就睇完嗰幾個即係錄影喇，咁就首先我哋見到中間嗰個有一位師傅，就即係展示咗點樣做即係唔同類型嘅即係焊接方法。嗰個我就知道應該係即係你哋VTC嗰位梁師傅就做嘅。

答：係。

問：嗰個應該係佢最近做嘅，係咪？

答：冇錯。

問：係嘞。咁我哋嗰個就暫時唔講住喇，因為我都會問番梁生有關佢嗰個工序或者工藝方面嘅問題嘅。

咁我就藉住就係尋日第一同埋最後嗰個錄影喇。第一個，以我所知，喺你嘅證人口供入面都有提及過，就應該係 Housing Society 嗰個影片嚟。

答：冇錯。

問：咁最後嗰個就應該係嗰個 Copper Development Center，...

答：冇錯。

問：...咁嘅影片嚟。我想問一問就係 VTC 就住--我哋講番 Housing Society 嗰個錄像先，幾時開始係用呢一個 video㗎？

答：據我認知就應該係 2010 年之後。

主席：2010？

答：10，係，冇錯。

問：一零/10 年之後？

答：係。

問：係咪？至於另外嗰個 Copper Development Center 嗰個呢，嗰個大概幾時？

答：都一樣係 2010 年之後。

問：都係差唔多同時間錄影嘅，係咪？

答：係嘞，冇錯，係嘞。

問：好。我想問一問你本人，你自己本人，有冇即係喺課堂上面，或者喺即係有關水喉嘅課程入面，你個人自己有親身展示過呢兩個 video，

有冇呀？

答：因為我冇份參與教呢個課程嘅。

問：係，所以就冇？

答：係嘞，所以冇，係嘞。

問：好。我想問一問你，就係喺你嘅證人口供第 46 段嗰度，或者我哋睇一睇。46 段嗰度，一開頭你都係講番--我哋等一等先。係嘞，W1 嘅 21 頁。我哋呢度就見到，就係你都係講番個 TLP。咁就另外都係講番啲 notes of jointing methods，嗰啲咁。咁就後面你有一度咁講嘅，話"Although its contents have not been amended to reflect the availability of lead-free soldering materials in the market at the time, I have confirmed with all the current instructors and teachers that on top of the teaching notes, they, when teaching the topic on soldering, have adopted the videos either developed by the Copper Development Center or the Housing Society to facilitate their teaching in the classroom."

咁我哋見到喇，第一個，即係關於 Housing Society 嘅短片嗰度，咁就應該係有講到話要用即係無鉛嗰個松香膏嘅。

答：冇錯，係。

問：但係就冇話特別去講到嗰個無鉛嗰個焊料嗰方面嘅。

答：明白。

問：但係呢個無鉛焊料嗰方面就喺第二個 video 嗰度...

答：冇錯。

問：...就有說明到喇咁。呢度我就想問一問你，就係你所講就話"have adopted the videos"，你嘅意思係咪即係話喺課堂上面就 show 畀啲同學睇咁呀，係咪？

答：冇錯，係，播出嚟畀同學睇嘅。

問：我想問一問喺展示呢個 video 喇，第一，我想知道嘅就係喺課堂上

面，我哋係講緊邊一個課程呢？例如係三年嗰個課程吖，定係嗰個短期嗰個、係 short course 嗰個課程呢？

答：三年嗰個 craft certificate course。

問：Craft certificate 嗰個，係咪？

答：冇錯，係。

問：咁 craft certificate 嗰個，你自己即係同啲 instructor 查問過，係咪喺有關講解緊例如 soldering 嘅時候就播呢個吖，定係喺個課程係邊一個環節度會播呢一個咁嘅影片呢？

答：Exactly 喺邊一個 topic，我就唔係好清楚，就係應該嗰個單元叫做 pipe work and installation 嗰個單元嗰度。

問：Pipe work installation，係咪？

答：係，冇錯。其中一位導師陳子健陣間都會作供嘅，佢係教呢個單元嘅其中一位導師。

問：係，我都會就住呢個再問番佢嘅。咁最後我想問一問你，就係即係就住你查問過有關嘅 instructors，通常呢兩個咁嘅短片，佢會係一齊播吖，定係佢會係分開，喺課程嘅唔同嘅時段播嘅？

答：Okay。呢個咁仔細，我就冇查問過。

問：好，咁我再問番陳生，或者，係嘞？

答：係嘞。

問：另外我想都係跟進番少少，就係關於嗰個課程嗰個編排。首先我就想同你澄清一下就係就住嗰三年嗰個課程嗰個編排，盧生，你本人有冇參與過嗰個課程嘅制訂㗎？

答：冇。

問：好。咁另外嗰個 5267 嗰個，即係嗰個短期課程嗰個內容嘅編排，你本人有冇即係參與制訂㗎？

答：都冇。

問：都冇嘅？

答：唔。

問：但係我想知道就係喺你哋 VTC 入面，例如參與制訂，咁我相信都應該係 construction department 喇，...

答：冇錯。

問：...即係營造建築嗰個系喇。

答：冇錯。

問：咁例如我睇到三年嘅課程入面，除咗水喉有關嘅課程或者課題以外，都有啲其他一般嘅課程嘅，...

答：冇錯。

問：...例如有啲係講及科學或者係計算嗰方面嘅。我就想問一問。我就想問一問，例如你 VTC，有冇特定一個例如-- construction department 入面，有冇一個特定嘅一個 plumbing 嘅 division，係負責去制訂呢個講義或者呢啲咁嘅教材㗎？

答：係。即係特定一個 division 就冇喇。咁喺個部門裏頭，因為我哋個部門有三個 campuses 嘅，係屯門、青衣同埋摩理臣我都有嘅。其實每一個課程都有一個叫做課程嘅--我哋叫做 course team 喇，即係教相關嘅單元嘅同事會走埋一齊去制訂呢個課程嘅。

問：係。咁即係如果我哋講緊一個三年課程嘅一個 course team 咁喇，係咪都會係有包括係專門即係水喉嗰方面嘅專家嘅？

答：冇錯，係，係。

問：呢個課程更加特別喇，不但只係我哋部門嘅同事會參與喇，你見到我哋作出一啲重大嘅改動，都會諮詢水務局嘅，透過嗰個 liaison part --個 working party meeting 嗰度亦都見到。

答：明白，明白，係。最後有一個可能比較 minor 啲嘅一點喇，我想問番你。喺 183.1 --對唔住，483.1 嗰度。483.1，如果我哋去第 3 嗰個事項，...

問：冇錯。

答：...呢個就係2006年3月8號，都係你哋嘅working party，即係同水務署嗰邊嘅代表，就有傾過一啲事情，咁就其中喺第3項嗰度，我哋見到有個"Complain case of 56767"咁樣。佢呢度就話"Chairman informed members regarding a recent complaint against 56767 in the newspaper. The purpose of this meeting was trying to collect mutual agreement amongst members in regards to admission standard, and better passing rate"咁。咁我即係假設，就可能有啲人就可能對於啲入學嗰個程序或者佢個決定唔係好滿意，或者對嗰個考試唔滿意，咁就有啲complaint喇。

咁下面就有一個咁嘅discussion嘅，就話"After lengthy discussion, various measures/proposals have been discussed. The following proposals were formulated for WSD's consideration"。

咁第一個就係"An extra module of 21 hours Plumbing Practice will be added to the course making up to totaling of 60個鐘頭. At the end of the course, there will be examinations in Theory and Practical Skill as the current situation."

首先我想問一問，呢個話當時個建議話加到去六十個鐘頭，呢樣嘢最後係咪都係冇...

答：冇做到。

問：冇implement到㗎？

答：用咗另一種方法去處理嘅，陣間你會見到㗎嘞。

問：好。下面嗰度，就係"If applicants equipped with the required practical skills ..., [for example] possessing of 53776, 55776"，即係我哋所講266同埋268嗰個course喇，"or Intermediate Trade Test Certificate (Plumbing), they can apply [for] exemption on studying the 21 hours Plumbing Practice. But they still need to pass the relevant examinations ... as now"咁。

呢度似乎就係話即係如果你有讀過266或者268，甚至係有一個Intermediate Trade Test Certificate嘅--首先我問一問

你，就係個 Intermediate Trade Test Certificate，呢個係咪都係即係你哋 VTC 嘅...

答：唔係，...

問：唔係？

答：...呢個就係 CIC 嗰個...

問：呢個係 CIC 嘅？

答：...--係嘞，semi-skilled worker 嗰個註冊。

問：呢個就係中工嗰個...

答：係嘞，中工，係嘞。

問：...--中工嗰個課程嘞，係咪？

答：唔。

問：即係中工嗰個註冊？

主席：咁係咪即係--中工如果註咗冊，就唔使讀呢廿一個鐘？

答：呢個係一個建議嚟嘅，當時，係嘞。

主席：我想問一問，就係中工或者大工嗰陣時候可以透過乜嘢途徑係攞咗 LP 牌呢？

答：暫時應該係冇，都係要靠讀呢三年嘅 craft cert，再考埋嗰個短期課程嘅試。

主席：即係佢哋冇機會㗎嘞，一定要去 VTC㗎嘞？

答：係呀。唔係話冇機會，佢讀呢個課程咪得囉。佢如果係 qualify entry 去讀呢個課程你得㗎嘞。

黎先生：哦，即係意思係完全係...

答：冇 exemption。

黎先生：...--中工嗰啲嘅訓練完全係冇用嘅？

答：唔以話冇用嘅。

黎先生：即係一定要喺 VTC 由頭再讀過嗰個三年嘅 course？

答：係嘞，冇錯，現時嘅做法基本上就係咁做喇。

黎先生：即係冇話一啲嘅 bridging 嘅 course 嘅？

答：或者 exemption 呀，咁樣樣喇。

黎先生：有冇 exemption 呀？

答：冇喇。

黎先生：都冇？

答：都冇嘅。

黎先生：乜都冇？

答：係嘞，暫時冇，係嘞。

黎先生：乜嘢其他 short course 係去...

答：嗄。

黎先生：都冇嘅？

答：都冇嘅，係。

問：即係所以呢度曾經提及過話「喂，如果你攞到中工嗰個資格，又或者你係讀咗 266、268 嘅，咁你就可以喺嗰個短期課程 5267 嘅時候就攞到啲 exemption，...」

答：冇錯。

問：...刪減咗嗰二十一個鐘頭」咁樣。

答：係嘞，冇錯嘞。

問：呢個建議係咪都係最後冇實施到嘅？

答：都係冇實施到嘅。或者我詳細解釋呢件事，究竟發生咩嘢事先喇，等主席或者委員更加明白喇。

問：好呀。

答：當時有 complaint 嘅。其實呢啲 complaint 間唔中都會出現嘅，對呢個課程，因為公眾對呢個課程有好多誤解嘅其實。因為嗰個課程嘅名稱真係叫做「課程」吖嘛。實質上個 nature，大家而家都明白嘞，其實就係一個考試，一個考核嚟嘅，呢三十九個鐘。咁於是乎有一啲人就唔合格，就歸咎 VTC，「點解你搞個課程，唔教識我合格嘅？」你明唔明白？「既然係課程，你有 training 㗎嘛，應該有 training ...（聽不清）教到我合格吖，係咪？啱唔啱呀？」

但係實質上你見到由 1992 年將個課程轉過嚟，個 nature 其實就係一個考牌嘅課程，考牌嘅--唔可以叫做「課程」呀，總之考牌嘅一個...

問：一個過程？

答：...--一個環節喇

問：一個環節？

答：係嘞。就住呢啲 complaint，於是乎我哋都內部作出咗好多嘅討論，究竟點樣解決呢，係咪？咁我哋都要面對呢啲現實嘅。呢個就係其中一個建議嚟嘅。我哋係做咗好多 study 嘅，究竟邊啲人嘅合格率高，邊啲人合格率低。我哋做哋做咗...（聽不清） analysis。其中一班人就係冇讀過 56767 同 53776，即係冇讀過嗰個三年制嘅 craft cert，咁嗰啲 or equivalent 嘅 qualification 嘅人讀--可以考呢個試嘅。而嗰班人因為佢個實務嘅經驗可能相對弱，於是乎實務嗰部分嘅考試，個合格率相當低。於是乎嗰班人--你發覺佢哋個學歷又相當高嘅--琴日都解釋過喇，係咪？咁佢哋係 tend to complain，枝筆寫得好好嘅，complain 嘅時候都。佢哋嘅理據都相當充足添。

黎先生：我想喺度問一問，係咪嗰係可以 exempt 咗嗰啲人，譬如話有個大學學位，...

答：或者嗰個學會...

黎先生：...engineering，有個大學學位，...

答：...--個學會嗰啲會員囉。

黎先生：...咁我可以免咗嗰三年嘞？

答：係嘞，就免咗嗰三年。

黎先生：完全免晒？

答：係，免晒嘅，係嘞。

黎先生：Okay。

答：係嘞。好嘞，咁就解決呢個問題，我哋發覺呢班人就嗰個 practical 相對弱嘅，於是乎我哋就建議喺呢個課程要加多一個單元，就係廿一個鐘頭，就 train up 啲人嘅 practical。所以呢個單元點解會 exempt 呢，廿一個鐘頭？Exempt 就係有讀嗰三年制嘅或者考咗中工牌嘅，因為嗰啲人個實務都相當好嘞，我哋覺得，係咪？於是乎就可以 exempt 呢額外嘅廿一個鐘頭嘅。換句說話講，就係呢廿一個鐘頭係專登設計畀嗰啲 or equivalent 嘅人，去提升番佢嗰個技術水平嘅，嗰個實務嘅技術水平嘅。

但係經過一輪討之後，你明白，個課程嗰個--當年點解唔採納喇，呢個我估計嘅原因喇，呢個就係，跟住落嚟我講嘅就係。我估計嘅原因就係因為唔想改變呢個課程嘅 nature。

咁又點解決咗呢個問題呢？你後面嗰啲 meeting notes 你都見到嘅，就係呢一個廿一個鐘就變成一個額外嘅課程，一個 short course，係 not mandatory 嘅，係任由啲人，如果覺得需要，可以參加嘅。如果覺得你自己個技能 okay 嘅，想考到呢個實務試嘅，你可以參加。於是乎提升你嘅能力，你咪可以將個合格率提升喇，係咪？

好嘞，你見到下一次嘅 meeting minutes，亦都有討論嘅，應該係，就住呢一個做法。

睇下先，去到邊一頁先。花少少時間搵一搵先，唔好意思。

問：得。

答：Okay。係嘞，去到492嗰版。

問：係。

答：就係2009年1月8號嘅meeting。

問：5.2嗰度，係咪？

答：係嘞。就係5.2嗰度，我哋係最褸屘係launch咗呢一個廿一個鐘頭嘅short course嘅，見到呢度，係嘞。

問：即係當係一個...

答：即係"tried to organize a 21-hours short course prior to the practical examinations"嘅。但係...（聽不清）嘅地方就係唔係好多人參與呢個課程。

問：因為要即係--其實係一個附加嘅course，因為要...

答：係嘞，係嘞。

問：即係好一個elective或者係一個...

答：係嘞，係嘞，係。係嘞，係嘞。

問：係，明白。咁所以即係就原本就係想係廿一個鐘頭係當係exemption，就冇做到呢樣嘢，因為驚影響到你個課程嗰個性質？

答：個nature，係嘞。呢個係我嘅個人判斷，呢個係嘞，係。

問：哦，okay。咁跟住就推出咗呢個廿一小時個extra嘅，咁就希望即係嗰啲如果係equivalent qualification嘅人佢哋會報喇，咁樣。

答：冇錯，係。

問：即係令到佢哋即係文武雙全喇，咁樣，但係就唔係好理想，嗰個反應唔係好理想。

答：係嘞，冇錯。需要讀嘅人，又發覺又唔讀喇，係嘞。

問：明白。咁到現時為止，係咪都冇任何嘅制度，就係話即係令到一啲例如攞咗大工牌或者中工牌嘅人有任何話特殊嘅 treatment 嘅？即係例如要去到考呢個二--即係去到讀呢個 5267 嘅時候，都冇任何特殊嘅...

答：冇嘅。

問：...做法？

答：冇錯，冇嘅。

許偉強先生：我冇其他問題。

主席：唔該。

黎先生：我想問一問，盧生，你制訂嗰個課程嗰陣時，有冇參考房委會或者房屋署佢哋嗰個建屋嗰啲 specification，有好多嗰啲規則嘅，即係譬如佢哋--而家我見到，譬如而家好多工程都係關於係公屋嘅工程，房委會佢有好多嘅 specification 訂咗喺度，係喺工程嗰陣時嘅要求，其中好大部分，有一啲部分，係關於係水喉方面嘅，咁喺呢啲嘅嘅，你制訂課程嗰陣時有冇參考房委會佢哋呢啲咁嘅建築嘅規則，嚟到制訂個課程嘅呢？

答：Okay。當時 2001 年、2004 年制訂呢個課程，我...（聽不清）冇參與喇，咁我只係可以一個概括性咁樣去答你呢個問題喇。我哋一般嚟講設計課程嗰陣時候係要參考行業而家做緊啲乜嘢去進行嘅。我相信不但只 Housing 嘅 speci、DSD 嘅 speci，就算私人嗰個 practice，究竟係點做法呢，都會考盧當中，其實係。因為喺制訂嘅過程之中，你發覺一樣，我哋不但只有自己內部嘅同事參與，其實我哋都會邀請一啲行業嘅人去畀意見我哋嘅。

琴日都講過喇，除咗嗰個課程，委員會制訂呢個課程之外，最褸屘個課程 launch 或者推出去畀公眾之前，仲有做個 validation 嘅 process。而呢個 validation 嘅 process 係一個 independent 嘅 panel，係 outside 呢一個制訂課程嘅人去成立

嘅，裏頭亦都有校外嘅人士嘅，咁佢哋會畀到意見我哋，其實喺當中有啲乜嘢地方，係不足嘅地方，會畀啲 recommendation，作出改善。

就算今次嚟講，今次嘅事件，你見到我所 submit 嘅嘢，基本上係講事件之前嘅嘢嚟嘅。其實事件之後，我哋都作出咗檢討嘅。就算房委會最近嘅報告，我哋都作出咗一啲改善嘅。喺今年，新嘅 intake，就算 craft cert 嗰三年制嘅課程咁咁樣樣都好，你見到喺個內容上面都--而家嘅 TLP 上面都更新咗嘅。有兩部分嘅更新。第一部分就係就住房委會嘅建議，就係嗰啲 soldering materials，點去 differentiate 有鉛同冇鉛嗰部分，已經納入咗喺我哋嘅課程內容裏頭嚟嘞。

佢哋亦都建議咗就係話要用一個咁嘅手提嘅 XFR analyser 去分析呢一個金屬物質裏頭有啲咩嘢元素嘅。咁我哋亦都喺度研究當中，如果我哋發覺係可行嘅呢，亦都會引入，成為我哋課程嘅訓練嘅一部分嘅。

不但只呢樣嘢，房委會都提議就係喺我哋嘅訓練裏頭應該要提升學員對呢個水質嗰個認知嘅。咁我哋都做咗嘅。我哋不但只喺個 TLP 嗰度--陣間陳子健亦都會講㗎嘞，亦都將最新--除咗最近嗰九個 circular letter 擠咗落去我哋嘅 TLP 度之外，亦都喺相關嘅地方亦都帶出咗喺世衛同埋其他國家對 heavy metals contamination of water 一啲標準亦都帶入咗裏頭嚟嘅。我哋個目的就係想提升學員不但只係講緊條法例，其實係 general awareness of 呢個 water quality。其實個過程...

黎先生：呢個係有少少係事件發生咗之後你哋做嘅嘢啫啫。

答：係嘞。

黎先生：你講緊你之前有冇咁嘅機制呢？

答：我就係透過頭先講嗰個嘞，就係一個新嘅課程出嘅時候要做 feasibility studies 喇，設計完之後要進行 validations 喇。不但只如此嘅，其實。Validation 完咗之後，就未完嘅，其實；仲有個叫 revalidation 嘅機制嘅。一個新課程出咗之後係有一個 validity period 嘅。喺嗰個 validity period 嗰段時間就要進行檢討，睇下個課程運作嘅時候係咪達至嗰個 QA 嘅 requirements；如果係達至就進行 validation，令到個課程可以繼續運作，咁樣樣嘅。

除此之外，就係每一年，其實每一年個 course team 都要做一個 review 嘅，annual review of 個課程。有個 QA 嘅 system 係確保個課程係接近個市場嘅要求。

主席：得，唔該。

黎先生：Okay，唔該。

許偉強先生：唔好意思，主席，我想跟進番一點嘅。

<u>許先生繼續盤問</u>

問：就係你剛才話即係事件發生之後，咁你哋都即係聽咗行內嘅意見，就亦都去更改咗一啲即係你哋嘅...

答：TLP。

問：...TLP 入面嘅內容嘅。如果我哋睇番個文件夾，790 頁。

答：係。

問：我哋見到嗰個「錫焊接合」嗰度，第 4 點，就好明顯就係--即係我哋知道，呢個喺 2015 年嗰陣時你哋就改咗喇。

答：冇錯，呢個新版本。

問：呢個新版本嚟嘅。咁剛才因為我都聽過你就住黎委員個問題，就係話你哋都要想更改下嗰個課程，等你哋可以 differentiate 到即係一啲唔同嘅物料咁樣嘅。咁你而家都做緊呢個步驟，即係去制訂個課程嘅時候，...

答：冇錯。

問：...或者喺嗰個用個課程嘅時候--教個課程嘅時候，都希望可以即係等啲學生係清楚啲明白，係可能唔同嘅焊料，即係應該係點用，等等嘅。

我想問一問就係就住話點樣去 differentiate 唔同嘅焊料，即

係例如有鉛或者無鉛嘅，即係呢個方面，即係你哋有冇話即係考慮過點解令到嗰個學生佢哋能夠有更多嘅認知呢，關於，「欸，佢用緊嘅究竟係有鉛、無鉛吖，呢樣嘢」，係即係點樣可以令到佢哋係更加清晰地係知道自己用緊一啲合適嘅物料呢咁？

答：Okay。就你見到，現時嚟講，喺行業裏頭就有啲試劑嘅，類似一枝棒咁樣嘅，陣間梁文先生會更加詳細解釋到畀你哋知。咁裏頭有啲藥水，係撳爆咗之後藥水就會摳埋，跟住透過一個海綿就滲出去。如果佢接觸到表面上面係有鉛呢佢會變色嘅。咁呢個係最容易 on site 好快測試到究竟嗰啲物質有冇鉛嘅，呢個係。

你見到我哋其實就住有冇鉛呢個 differentiation，我哋其實喺 2004 年同水務局開會嗰陣時候，我哋都問過呢個問題嘅。其實我哋啲 instructions 都 aware 其實世界上應該有呢樣嘢嘅，但係不幸嘅地方就係當年喺香港嘅市場，個 industry 根本係買唔到，可能未咁 common。但係而家呢件事之後，就發覺好容易買到，大家都。

除此呢個方法之外，其實--一陣間梁文都會解釋嘅，就算就肉眼，你發覺就憑個光澤都可以分辨嘅，其實係。再有啲較為高科技嘅，就係嗰隻 XFR 嘅 analyser。咁呢個不但只係驗出有冇鉛，所有嘅重金屬佢都可以 identify 到。咁呢個我哋係而家係研究當中嘅，睇下需唔需要喺呢個課程上面。

問：係，明白。好，唔該你。

<u>殷先生盤問</u>

問：盧生，我都想跟進一啲啱啱許大律師問咗話，即係教啲學生點樣去分辨嗰啲有鉛、無鉛嘅焊料，當然有好多種方式。

答：冇錯。

問：你用一啲儀器去探測，係一種方式。睇睇個包裝，即係綠色嘅一卷嘅咁，可能或者睇下啲...

答：Label，係喇。

問：...label 咁，係一種喇。咁但係你頭先都提到，其實其中一樣嘢肉眼都到，越係--我哋知道如果含鉛嘅錫料，同埋差不多係即係所謂無

鉛嘅錫料，係唔多 100 個 per cent 係錫嘅，錫嗰啲係靚好多嘅，光身好多嘅，鉛嗰啲係啞色好多嘅，係咪？

答：即係我哋嘅 instructor 解釋畀我知就係咁喇。

問：係喇。同埋我哋聽到之前有啲證人講，其實用起上嚟，如果有經驗嘅水喉師傅或者焊接方面有經驗嘅師傅，根本佢燒起上嚟都知道嗰啲焊料嘅稀杰，或者個槍去到幾熱佢就熔，其實都知嘅，應該；係一種方式，係識辨嘅方式嚟嘅？

答：我未試過，我相信應該係。陣間你可以試下問一問梁生，係。

問：即係有冇考慮係個課程係--即係我哋可唔可以咁講呢，喺 7 月，舊年 7 月鉛水事件發生之前，個課程係冇乜係專注話喺呢一方面去提升嗰個學員對唔同嘅焊料嘅識辨能力，冇向佢嗰啲即係點樣樣嘅實質嘅分別嗰方面嚟睇？

答：就我估計喺呢件事件發生之前就冇咁強調，但係亦都有教嘅。即係嗰個分別嘅方法，完全就咁用光澤去分別，我相信唔係一個可靠嘅方法，因為你有比較先得㗎嘛，啱唔啱？除非你揀住一個有鉛、一個冇鉛去比較嘅啫。

我深信嗰啲 instructors，你見到佢喺堂上面，喺個 minutes 都有講，同水務局嘅官員，最基本、最簡單，個 labelling 已經係一個容易嘅分別，除非個 label 有人作假嘅啫，係咪？咁上面寫住 "leaf-free"嘅一個 label，咁係好清楚係 lead-free 喇；如果嗰個 label 寫住係 50 個 per cent lead 嘅，咁就好明顯係 50 個 per cent lead 喇，係咪？咁一個人有 common sense 嘅都知道鉛係有毒㗎喇，係咪？事實上我哋嘅課程都有講鉛係有毒嘅。

問：係。我唔係話你哋嘅課程有咩嘢短缺或者不足。我係想探討下，即係其實事實上係會唔會話個課程講就講咗話要用無鉛焊料做食水，但係因為個教授畀嗰個學員嘅知識都係比較片面，令到佢哋理解唔到，好多嘢佢哋答唔通。

答：明白。同埋我都講過喇，一個課程裏頭，所有嘅元素、所有要學嘅嘢都相當重要嘅。當然今時今日突然之間有一個 topic 更加重要，咁我哋會更加強調喺個課程嗰度講。事實上喺我哋課程設計嗰陣時候，亦都要反映行業個轉變。咁係而家行業係特別關注呢個課題，我哋係特別關注，亦都係啱嘅。

問：因為我見你個課程入面，其中有一樣嘢叫做"Craft Theory"嘅。

答：冇錯，係。

問：或者有啲係講話 plumbing theories，咁樣嗰啲咁嘅。即係對於唔同焊料，我哋而家唔係淨係講有鉛、無鉛。

答：明白，係，係嘞。

問：包括埋 brazing 盛咁。即係其實唔同嘅焊料嘅性質嘅性能，或者係即係長處、短處比較，用起上嚟有啲咩嘢，容易啲，但係可能有毒，所以可以用某啲嘢，唔可以用某啲嘢，即係呢方面，呢啲咁樣嘅理論嘅知識，係教幾多畀啲學員嘅呢？抑或係呢方面就唔係話太深入咁呢？

答：其實都相當深入嘅。以前就叫做"Craft Theory 1"，新嗰個單元叫做"Pipe Work Installation"。咁你見到 pipe work installation 嘅單元嘅 notes 我都擠咗喺度，係事件發生之前嗰份 notes，擠咗喺度。咁你睇到裏頭係講晒唔同材料嘅特性嘅，包括銅、鉛、不鏽鋼、nickels，各方面。你見到其中有一段亦都講咗鉛係有毒嘅。

咁我哋一哋先。你睇去第 525 頁，教材嘅第 2 段，「材料」。你見到所教嘅材料係相當廣泛嘅，其中就算銅，你發覺佢都講係有毒嘅，喺某啲情況產生化學作用係有毒嘅。你見到 2.2 嘅第(二)，「銅」，銅遇到醋起化學作用，產生呢一個叫做乙酸銅，其實係有毒嘅，呢個都。你見到其實個 notes 個內容係相當詳細嘅，所有嘅材料都包含在內。不同嘅接合嘅方法，不但只係金屬，非金屬都有，你見到後面繼續講嘅就係。

你見到係 527 嗰版，塑膠嘅材料喇，係咪？咁每種材料嘅喉管嘅接駁方法，咁亦都會有講解嘅。咁一路攞落去嘅話，你就會見到㗎嘞。

去到 541 頁，銅管嘅喉管嘅接駁，接駁方法有三種，佢都介紹咗出嚟嘅。跟住就係鑄鐵筒嘅接駁方法，亦都有介紹嘅。

問：我明嘅，盧生。但係我個問題嘅精粹就係，即係譬如我哋知道有鉛焊料同埋無鉛焊料，除咗話鉛係有毒之外，其實有幾個方面都好唔同嘅。一個就係無鉛個焊料所接駁嘅嗰個 joint，個接駁點，其實係嗰個性能，即係 withstand pressure，喺壓力下嘅，受壓嘅程度好過啲無鉛焊料。亦都我哋知道鉛本身，喺個焊料，混合喺一啲鉛、錫

合金嘅焊料入面，鉛係幫助嗰啲焊料去滲透入去嗰啲 capillary joint 嗰度，所以如果用無鉛嘅焊料，又要用番一啲特別嘅 flux 去幫助去帶番啲焊料入去。即係有多呢方面嘅嘢。

咁有冇即係教授畀啲學員，即係從而就話畀佢聽，「喂，係呀，有鉛焊料可能係易用啲，不過你用咗呢，會走晒入啲水喉度，令到人哋食咗有毒」，咁即係會唔會話呢方面提起唔到佢哋嘅關注性咁呢？

答：instructor 喺班房實際上點教，我冇法子答到你。我只係憑我見到嘅 documents 得知嘅啫。你見到考試題目都有講嘅其實，即係加咗鉛之後，嗰個熔點有啲咩嘢改變，你見到佢都有問學生，其實係；咁係降低咗個熔點，係咪？咁某程度上都可能就係即係反映番你頭先所講嗰啲理論喇，係嘞。

咁仲有一樣嘢我都要強調嘅就係呢個係一個 craft certificate course，理論固然重要，但係最重要嘅你見到喺三分之二嘅課程係講緊係要 hands-on 嘅。理論教授咗畀個學生，佢最褸屘出嚟佢一定要 hand-on 識得做嗰件事。就好似學游水一樣，大把嘅理論，最褸屘都係唔識游嘅。我睇咗好多 video，關於呢一個鐃鉛焊，你哋可以即刻去燒喇，我相信係燒燘咗嗰條銅喉囉。

問：仲有一個問題啫，就係關於嗰啲 British Standards。你知道其實水務條例入面就好多關於喉管或者用食水嘅原料，都係話叫你睇番嗰啲英國標準嘅。

答：冇錯，係。

問：當然水務條例，香港法例就又有中文，又有英文㗎喇。但係佢叫你睇話跟呢個英國標準嚟做，啲英國標準基本上就冇中文版嘅，你同意嘛？

答：同意。

問：許大律師琴日問你嘅時候，你都講過話其實即係，我嘅理解，就係除咗入學嘅基本要求話學員要而家要有中三程度，舊陣時小六程度，但係除咗呢個要求之外，基本上係冇嘢係確保嗰啲學員有適當嘅英文水準嘅，同唔同意？

答：可以咁講喇，係。

問：咁因為我--有一度就話，你琴日就話有課程入面，其實你哋唔可以教

晒、講晒話啲英國標準入面有啲咩嘢要求，你都係抽一啲嘢嚟講嘅啫。

答：冇錯，係。

問：其餘都係話畀佢聽，「你要跟英國標準」咁。咁我有一個懷疑就係即係如果--我哋喺呢個研訊所睇過啲英國標準都幾難睇嘅，其實；即係對個語文嘅水準嘅要求都幾高嘅，如果你要明白嗰個英國標準入面講嗰啲嘢。咁你啲學員，中三程度嘅，你叫佢去睇，淨係話咗畀佢聽要跟英國標準，咁係咪有個唔腍合嘅地方？即係佢自己就算係睇，佢都唔--如果佢搵到嗰份嘢，佢都唔識睇喇；你同唔同意？

答：呢個係我哋個基本入學要求喇，咁視乎每一位學員個背景嘅。Craft cert 係一個最基本嘅要求。佢去到考牌之前，佢仍然要過嗰三十九個鐘頭嗰個試。咁嗰個三十九個鐘頭嘅試頭，雖然，冇錯，嗰個課程都仍然係以中文為主，咁我亦都會考啲相關嘅法例嘅要求嘅，同埋可能一啲英國標準嘅要求。咁如果佢合格咗嘅，咁簡單講，佢應該能夠喺佢四年嘅工作生涯裏頭可能都會掌握到一啲相關嘅知識，先至考到嗰個試合格，去成為呢一個註冊水喉匠。

你見到嗰個合格率係好特別嘅，我琴日亦都解釋過，craft cert，冇錯，佢嘅語文能力係差，所以喺考牌嗰部分，theory，所謂理論嘅部分，合格率亦都反映出嚟係差嘅。調番轉嗰個學會，嗰啲會員，佢嘅語文係強，因為英國會嚟㗎嘛。你發覺佢哋嘅理論嘅部分，佢哋合格率係高嘅。所以最褸屘把關嘅就係呢一個三十九個鐘嗰個考試。如果嗰個學員讀完個 craft cert 之後發覺佢嘅語文唔係好掂喎，睇啲 BS，佢應該去進修；如果唔係，就合格唔到嗰個 theory。

嗰四年嘅工作經驗其實係佢個--即係係佢嗰個註冊考牌成為水喉匠嘅其中一個重要嘅元素嚟嘅，除咗嗰三年嘅課程之外。

問：正正就係咁，盧生，因為如果係靠佢嗰四年工作嚟講，就我哋都知道行業入面唔會話做晒市面上有唔同嘅物料或者唔同嘅工種都係做晒嘅，...

答：明白。

問：...通常都係二、三十個 per cent 最頂龍嘅，即係成日常用嗰啲，即係成行成市，人人都用嗰隻嘅，咁就個個都用。即係好似無鉛焊料，咁我哋聽到其實有第二個牌子嘅，不過香港就個個都用呢隻綠色呢隻"FRY"呢隻嘅。咁會唔會造成就係其實佢學到嘅知識都係好片面，變咗如果佢唔理解背後嘅理論，或者唔深入咁理解...

主席：其實，Mr Yin，你呢啲問題放諸四海而皆準。你 PCLL 都係咁係教得好表面嘅啫，啱唔啱？

答：我正想就係咁講，我考工程師牌，我讀咗嗰三年，...

主席：咪係喇。

答：...係咪可以足夠我去考個工程師牌，都係...（聽不清）問嘅。

主席：你 LLB 加個 PCLL，你而家做咗咁耐律師嘞，你覺得佢哋其實係咪教到好深入呀？梗係冇可能嘅。

殷先生：唔係，我帶出一點就係佢叫嗰啲人睇 BS。

主席：我知。

殷先生：就係嗰點嘅啫。

主席：呢個就係講到個問題去到個課程究竟應該教到幾深入，係咪？因為你而家基本上個 craft 係中三讀出嚟之後，佢哋又做咗四年嘢，咁佢哋實務嘅嘢又識嘞，咁 licensed plumber 你都要搵人做㗎，係咪？當然如果有個 PhD 就梗係最好喇，係咪？不過唔會吖嘛，係咪？

殷先生：我唔係 critcise 嗰個...

主席：係。唔係，我明你嘅意思，得㗎嘞。我明㗎嘞。

仲有冇人有問題？冇問題嘅話，唔該晒，盧...

聶先生：主席，我有少少，問即係兩樣好短嘅嘢。

聶先生補問

問：盧生，琴日許大律師就問過你，關於你嘅證人供詞第 annexure 14 嗰度。或者麻煩你揭番去 563 頁。許大律師琴日就問過你，就係話喺呢一頁嗰度，即係講關於焊錫材料嗰度，就冇去好明確去話焊料係一

定要無鉛嘅。咁你嘅答案，我嘅 notes 就話你係講咗話，啊，其實喺個 video 嗰度有講喇。咁其實喺其他地方都有講嘅。

我想請你睇番你嘅證人供詞最屘嗰段，第 26 頁，你嘅證人供詞第 59 段嗰度，其實你都作咗一個好清楚嘅總結。

答：冇錯。

問：你睇到第(1)小段嗰度，你就講咗 video 喇。咁樣其實喺第(2)同埋第(3)小段嗰度亦都提及過喺個課程嘅其他嘅方面都係有提及過有用無鉛嘅焊料嘅，係咪？

答：冇錯。

問：係。

答：我哋集中嗰份 notes 係講其中一個單元嚟嘅啫，其中一個 TLP 嚟嘅啫。咁第一，即係你要明白，即係當年嘅教學，除咗 notes 之外，嗰個 verbal delivery 係相當重要嘅，尤其是早期教育嗰陣時，亦都冇 video，亦都冇 PowerPoint 嗰個年代，個 verbal delivery。事實上教授呢一班學生，craft level 嘅學生，好多時係要手抄 notes 嘅，要等佢更加深深咁明白嗰啲嘢嘅。

好嘞，不但只有 theory。Theory 唔係最重要。最重係嗰個 practical section，實務，對於 craft level 嚟講嘅學生。所以喺實務嗰度，我哋真真正正攞啲無鉛嘅焊料畀大家睇嘅，同埋有鉛焊料之間嘅分別。呢個就係第二嗰個。陣間亦都你可以問問梁文先生，佢教嗰陣時係應該點教法。不但只如此，最褸屘就係頭先所講嘅指關嘞，嗰三十九個鐘頭考試，咁我哋再次提一提醒嗰啲學員，「究竟你作為一個 licensed plumber，你要符合啲咩嘢要求呢？」

問：係。最屘一樣嘢，就係琴日許大律師亦都提過，問過你，喺你作供嗰陣時候，就話嗰啲試卷係有問過嗰啲學生有啲是非題，就係話鉛係咪有毒呀，咁係是或者非喇，咁樣。咁你琴日係講咗有嗰個即係試卷嘅問題，咁一定喺教學材料一定有提喇。咁你其實啱啱早上亦都有提過話喺教學材料有提過呢樣嘢㗎喇。咁其實你頭先都帶咗委員會去睇 525 頁嘅。

答：冇錯。

問：你頭先亦都喺呢度睇過就係話唔同嘅金屬嘅材料嘅特性，咁樣其中第

(三)點就係講關於鉛係有毒，你同唔同意？

答：冇錯，係。你見到 notes 係有講，咁亦都考試亦都有考喇，所以所有嘅學員都應該明白鉛係有毒嘅。

聶先生：我冇其他問題嘞，主席。

主席：好，唔該晒。

唔該晒，盧先生，...

答：得，好。

主席：...可以走得㗎嘞。

答：唔該晒。

主席：唔該晒你。

聶先生：主席，我下一個證人係陳子健。

主席：好呀。

<u>職業訓練局第二證人：陳子健（職業訓練局導師）以本地話宣誓作供</u>

主席：請坐，陳先生，請。

<u>聶先生主問</u>

問：陳先生，請你揭去你嘅證人供詞嘅。

答：係。

問：咁就請你揭去證人供詞第 8 頁嗰度，有一個簽名嘅。

答：係。

問：呢個係你本人嘅簽名嚟？

答：係。

問：第 9 頁都係你嘅本人簽名？

答：係。

問：咁我首先會將你嘅證供詞讀出咗，咁然之後我再問你問題。

答：好。

COMMISSION OF INQUIRY INTO EXCESS LEAD FOUND IN DRINKING WATER

Witness Statement of Chan Tze Kin (陳子健)

1. I, Chan Tze Kin (陳子健), provide this statement in response to the request made by way of a letter dated 18 November 2015 **("the Request")** issued by Messrs. Lo & Lo **("Lo & Lo")**, the solicitors acting for the Commission of Inquiry into Excess Lead Found in Drinking Water **("COI")** to the Department of Construction of the Hong Kong Institute of Vocational Education **("IVE")**, Morrison Hill Campus. The Request requires responses to a total of eleven areas raised by the COI.

Personal Background

2. I completed the Basic Craft Certificate in Plumbing and Pipefitting offered by the then Construction

Industry Training Authority (renamed as the Construction Industry Council in 2007) in 1981. I then went on to study at the University of Central Lancashire and obtained a degree in Building Service Engineering in 2008.

3. I studied the Craft Certificate in Plumbing and Pipefitting offered by the Vocational Training Council **("VTC")** from 1981 to 1983 at Haking Wong Technical Institute (course no.: 0286) and graduated in 1983. I then passed the registration examination offered by the Water Supplies Department **("WSD")** and became a licensed plumber in 1984.

4. I joined the VTC at the VTC Pokfulam Complex in November 2001 and have since been employed as an instructor. I started to teach in the Craft Certificate in Plumbing and Pipefitting course no.:55776 (part-time evening course) since 2006 and 53776 (part-time day course) since 2010 (the **"Course").**

5. I am authorized by the VTC to make this statement in response to the Request of the COI. This statement mainly covers questions 6 to 11 of the Request which are related to my position as an instructor teaching in the Course. I have read a copy of the witness statement of Mr. Lo Wing Hong **("Mr. Lo")** (the head of construction department of IVE (Morrison Hill) dated 23 December 2015 and also a copy of the witness statement of Mr. Leung Man **("Mr. Leung")** (the senior instructor of the construction department of IVE (Morrison Hill) dated 23 December 2015. I believe the contents of the witness statements are correct and true.

Area No. 6 of the Request

6. Area No. 6 of the Request referred to the fact that from the evidence currently available, the use of copper pipes gradually became popular since around 2002, particularly in the context of public housing developments. With extensive use of copper pipes, the method of soldering for the purpose of jointing pipes was also widely adopted. VTC was asked by the COI to describe whether and if so, how the plumbing courses and programmes offered by the VTC have made corresponding changes to cater for the popular use of copper pipes and fittings in the construction and installation of the fresh water plumbing systems.

7. Though I was only engaged to teach the Course in 2006, I have read the relevant 1996 Course Scheme, 2001 Course Scheme, 2004 Course Scheme and Mr. Lo's witness statement describing the changes of the courses during that period, in particular paragraphs 42 to 50 of his witness statement. I agree with the contents of Mr. Lo's witness statement.

Area No. 7 of the Request

8. Area No. 7 of the Request asked the VTC to confirm whether students were/are taught the different components (and the composition thereof) and materials used in the construction and installation of the fresh water plumbing system.

9. The syllabus of the module "Pipe Work Installation" at p.38 of the 2004 Course Scheme (see Annexure 8 of Mr. Lo's witness statement) covers the various materials and components of a plumbing system. I confirm that I have taught the students different materials used in plumbing works, which include the construction and installation of the fresh water plumbing system. The materials taught include metals

(iron, copper, lead, aluminum, tin, zinc, chromium), alloys (brass, bronze, gunmetal, cast iron, wrought iron, mild steel, stainless steel) and thermos-plastics, thermal-setting plastic materials. I enclose copies of the latest version of the relevant teaching and learning packages **("TLP")** distributed to the students during the Course as **Annexure 1** for the ease of reference of the COI I also confirm that I have taught the students different types of pipes and their jointing methods, including the properties, sizes and applications of piping materials for copper pipe, galvanized steel pipe, lined galvanized steel pipe, stainless steel pipe, unplasticized polyvinyl chloride pipe, chlorinated polyvinyl chloride, polyethylene pipe, crossed-linked polyethylene pipe, cross-linked polyethylene/aluminum/cross-linked polyethylene composite pressure pipe, polybutylene pipe and acrylonitrile butadiene styrene pipe. I enclose copies of the relevant TLP distributed to the students on different types of pipes as **Annexure 2** and copies of the relevant TLP on the jointing methods as **Annexure 3** for the ease of reference of the COI.

Area No. 8 of the Request

10. Area No. 8 of the Request asked the VTC to confirm whether soldering and soldering materials used in jointing of pipes for fresh water supply were/are topics covered in the courses run by the VTC during the Material Period (i.e. from 1969 until now) and whether students were/are taught the different types and brand names of solder materials available on the market, including materials which are lead free and those which contain lead, and the differences (in components and functions) between solder wire (錫線) and solder strip (錫條).

11. The topics on soldering are set out in the syllabi of (i) module entitled "Pipe Work Installation at p.38 and (ii) module entitled "Plumbing Practice I(A)" at p.46 of the 2004 Course Scheme. I confirm that I have taught the students about soldering and soldering materials and enclose copies of the relevant TLP distributed to the students during the Course as **Annexure 4** for the ease of reference of the COI.

12. I wish to draw the COI's attention that the TLP exhibited in Annexure 4 was revised to include reference to the new requirement of the WSD for a supporting document which is to prove the lead free grade soft solder or filler metal used in soldering, brazing and/or welding construction methods and such supporting document has to be submitted to the WSD for approval. I enclose a copy of the WSD Circular Letter No. 1/2015 dated 13 July 2015 as **Annexure 5**.

13. I refer to paragraph 46 of Mr. Lo's witness statement and I confirm that although the TLP prior to July 2015 has not been amended to reflect the availability of various types of soldering materials in the market, I have taught the students to use lead-free solder for fresh water plumbing system during the class since I started teaching the Course. On top of the teaching notes, I have adopted a video produced by the Copper Development Center in my teaching. A copy of the video is attached as Annexure 15 of Mr. Lo's witness statement. It is clearly stated in the video that lead-free solder should be used for potable water system at 5:24 to 5:38 in the video with file name AVSEQ02.DAT. Soldering materials with lead can be used for other purposes such as soldering for electrical wiring or sewage pipes.

14. I have taught students of various types of soldering materials including both lead-free and with-lead and the relevant standards but not mentioning the brand

names of solder materials available on the market so as to avoid being criticized of showing bias to one particular brand as there are many brands of solder materials available on the market.

15. Solder wire (錫線)and solder strip (錫條) should have the same composition. Their function is also the same, i.e. providing solder materials to the jointing area so that the pipe and the pipe fitting (接駁用的配件) could be jointed together. It must be stressed that the solder materials used should all be of lead free, and it does not matter whether it is in the form of solder wire or solder strip.

16. For the information of the COI, the TLP will be updated regularly to keep abreast with the latest development in the industry. Additional teaching materials may sometimes be distributed ad hoc during the Course to the students. Instructors will always supplement the TLP with additional information (either orally or in writing) during the Course.

Area No. 9 of the Request

17. Area No. 9 of the Request asked the VTC to confirm whether I or the VTC was aware of a soldering material (which is in the form of strips) by the brand name of "50 力扁錫條", and provide a sample of such material and describe the composition (particularly the lead content) of such material.

18. I have never heard of a soldering material with the brand name of "50 力扁錫條". Therefore, I am not in the position to provide a sample and describe its composition.

Area No. 10 of the Request

19. Area No. 10 of the Request asked the VTC to confirm whether, during the Material Period, students were/are taught that plumbing materials including solder should be of a lead free category and the risk of using plumbing materials which contain lead.

20. I would like to re-iterate that I have always taught the students to use lead free soldering material during the class since I started teaching the Course. I refer to p.39 of Annexure 4 which states clearly that the soldering materials must be of lead free.

21. I also refer to p.18 of Annexure 2 which states that the respective BS reference for the different materials. The material bearing a BS reference means that the material complies with the relevant British Standard. Materials manufactured according to the respective BS, including BS2871, BS864, BS EN1057 and BS EN1254-1 for plumbing materials, shall be lead free.

Area No. 11 of the Request

22. Area No. 11 of the Request asked the VTC to confirm whether, during the Material Period, students were/are taught the skill of soldering for the purpose of jointing copper pipes, and if so, describe the method of jointing pipes properly by soldering. For the purpose of demonstrating the jointing of pipes by soldering, provide a softcopy of a video as an exhibit to the witness statement.

23. The steps for jointing pipes by soldering are set out at Part 4.3 at p.40 of Annexure 4. The translation

is as follows:-

(1) Clean the areas to be used for jointing properly by using reaming blade, sand paper or abrasive pad.

(2) Apply flux on the joint and avoid using excessive flux.

(3) Apply heat to warm the joint.

(4) Apply heat to the areas to be touched by the solder and the solder using flame with appropriate temperature, the flux will assist in drawing the molten solder to the joint, and the solder would fuse with the metal surface.

(5) Use wet cloth to clean the flux remained at the jointing area.

24. I have watched the three videos which Mr. Leung has produced as Annexure 1 in his witness statement. Mr. Leung, who is responsible for teaching the workshop practice of the Course, showed how jointing copper pipes by soldering (one with solder ring fitting and one fitting without solder) has been taught in the Course. I confirm that the methods mentioned in those videos are correct.

Conclusion

25. To conclude, I trust that the following topics covered in the 2004 Course Scheme and also the relevant TLP distributed to the students during the Course are relevant to the Request of the COI:

(1) All common types of materials and components used in the plumbing industry are covered in the module "Pipe Work Installation" in the 2004 Course Scheme and the relevant TLP produced at Annexure 1 of my witness statement.

(2) The three types of common joint method of copper pipes, including capillary joint, are introduced in Section 3.2.2 of the module "Pipe Work Installation" (see p.17 of Annexure 3 of my witness statement)

(3) A specific topic on soldering is covered in Section 4 of the module "Pipe Work Installation" (see pp.39 to 42 of Annexure 4 of my witness statement).

(4) The effect of lead on heath is covered in Section 1.8 of the module "Potable & Flush Water Supplies" (see pp.8 to 10 of the relevant TLP at **Annexure 6**)

(5) A topic on quality of potable water and its testing method is included in Section 1.11 of the module "Potable & Flush Water Supplies" (see pp.25 to 27 of Annexure 6 of my witness statement).

(6) The recent incident of lead in potable water is adopted as a case study in Section 1.15 of the module "Potable & Flush Water Supplies" (see pp.34 to 37 of Annexure 6 of my witness statement).

問：陳生，我頭先講完你嗰個證人供詞。我想你睇番頭先我啱啱讀咗第7頁嗰度，25段嗰度，由最屘數上嚟第三行嗰度，第(4)個分段嗰度，"The effect of lead on "，我諗應該係"health"，即係「健康」？

答：係，係。

問：除咗呢樣之外，你確認你嘅證人供詞裏面講嘅嘢係準確或者真確？

答：係。

問：你願唔願意採納呢份證人供詞作為你呢個聆訊嘅證供？

答：願意。

聶先生：主席，我冇其他問題。

主席：唔該。

<u>許偉強先生盤問</u>

問：陳生。

答：係。

問：早晨，係。我就想就你個履歷嗰度，就先問一問你有啲問題。

答：係。

問：喺你嘅證人口供第2段開始，就有提及你嘅履歷。咁就你都講出咗喺1981到1983年，當時喺黃克競，就讀過呢個即係Craft Certificate in Plumbing嘅？

答：係。

問：我想知一知，就係你講嗰個課程，都係我哋知道嘅286嗰個課程。

答：係。

問：當時係咪一個三年嘅課程嚟㗎？

答：係。

問：三年嘅課程。咁就以當時嗰個制度嚟講，就讀完三年課程之後，就冇

嗰個 5267 嗰個短期課程，係咪，當時？

答：冇。

問：冇。所以就如果你要去水務署申請做持牌水喉匠，就要考水務署本身嗰個試嘅，係咪？

答：係。

問：我想了解一下，就係當時考水務署嗰個試係有啲咩嘢內容㗎？

答：當其時個內容，佢都係維繫住個水務嗰個法例，同埋你有冇--係咪真係做嗰行咁樣。當其時個考試就係有兩部分，第一部分就係筆試；第二部分就係面試，即係同啲水務署官員就係面試咁樣。

問：係。筆試嗰方面，係咪都包括要即係畫圖嗰啲？

答：係。

問：除咗畫圖之外，有冇啲選擇題嗰啲咁樣嘅題目？

答：我記得就冇。

問：冇嘅。有冇就住話做嗰個水喉燒焊嗰個工序，有任何--即係考試嘅內容有冇涵蓋、概括呢樣嘢？

答：佢內容概括嗰度，就因為佢其實包含晒所有其實嗰個水務條例嗰啲嘅。

問：唔。

答：咁其實...

主席：包括晒所有咩嘢話？

答：水務條例。

主席：係。

問：係。

答：即係話其實你如果--佢水務條例有個要求，應該都係要包含。

問：唔。你就你記得你當時考試嗰陣時，即係需唔需要話特別因應嗰個水喉接駁，即係焊接嗰個問題，就有任何即係需要答嘅問題，或者係展示個工藝等等？

答：當時就應該冇。

問：冇嘅，好。我想問一問就係，你就成為持牌水喉匠一個...

主席：我想知道多少少當時考試嘅嘢。

許偉強先生：係。

主席：因為我哋而家今次呢件案件裏面有幾位水喉匠，都係八十年代嘅時候考到佢哋嘅水喉匠資格。

答：係。

主席：我就想知道吓，頭先許大律師就問咗你筆試，同埋面試，係咪你講？

答：係，面試。

主席：即係口試？

答：係，口試，係。係，口試，係，okay。

主席：口試係考乜嘢嘢嘅呢，口試？

答：其實口試就佢個範圍都好廣。

主席：唔。

答：其實即係亦都--我哋所知，佢就亦都係問關於水務嘅嘢。會有問你入表，點樣申請水錶，同埋可能有啲工程上嘅嘢都會有問。當然可能個個都唔同喇。

主席：係。

答：佢就住可能又同你好似傾偈咁樣，傾落去，就咁樣一路問。

主席：得。當然嗰陣時個水務條例同而家個水務條例有可能會有少少唔同。

答：係。

主席：我哋知道而家個水務條例裏面，就有好多--有啲條例都講--無論條例又好、規例又好，都有講到水喉--用水喉，邊啲准用，邊啲唔准用。

答：係。

主席：係咪？

答：係。

主席：有譬如銅喉，或者 GI pipe，GI lined pipe，或者你個課程裏面都有講到唔同。

答：係。

主席：我想問下，因為你就話其實筆試都--口試講到水務條例吖，水務條例裏面又有講到呢啲咁樣樣嘅喉管嘅物料，而呢啲喉管嘅物料亦都有 British Standard--而家嗰個條例有 British Standard 寫晒喺度。

答：係，係。

主席：我想問下，嗰陣時嗰個水務條例有冇都涵蓋到呢個 British Standard 呢啲嘢？

答：以我記得，因為都...

主席：都好耐喇。

答：...--我考到牌都成三十幾年。

主席：係呀，係呀。

答：因為當其時其實都係同而家個法例當然會有唔同。

主席：係。

答：但係其實個精神呀盛都係差唔多。

主席：啱。

答：以我記得，應該都係有參考番英國標準。

主席：得，好。我哋知道--當然我哋知道銅喉嘅英國標準嗰陣時候，就係呢個一九八--864 好似係 1983 年嘅。

答：係。

主席：係咪？你就係 1984 年，即係啱啱新鮮熱辣出爐，864。864 British Standard，即係如果一九--如果嗰陣時個水務條例有講到，就應該會係講呢一個 864？

答：864 嚟講，應該嚟講佢主要就講啲配件，啲銅配件，攢栓，同埋走錫嗰啲配件嗰個標準。

主席：啱嘞。864 嘅--因為 864 裏面就已經有講到焊料呢一樣嘢。

答：係。

主席：啱吖，係咪？

答：有，有。

主席：當然 864 係一路--我嘅理解，一路有--一路有 amendment，一路有修改。

答：係。

主席：去到最後我哋知道嗰個所謂 Table 17，就係好似去到一九八--我唔記得咗八幾年，即係唔係一出嚟就有。你等我一陣。應該 1987 年。

答：係。

主席：1987 年就有呢一個所謂 Table 17 出現。你--唔係，你唔記得個囉呵，呢啲嘢？

答：詇...

主席：唔係，我淨係想知道就係咁樣樣嘅啫，其實。因為 864 裏面嘅 5.2，就有講 solder，我唔知喺邊度搵到。

可以喺邊一度搵到呀？

許偉強先生：應該係C12。

殷先生：我唔知可唔可以協助呢？

主席：可以。

殷先生：係。據我嘅理解，英國嗰個Water Byelaws係87年嘅時候改動過，係87年先至正式話唔准用含鉛焊料。

主席：我知，我而家講緊BS，我唔係講緊英國個Water Byelaws。

我哋喺審訊嘅過程裏面就曾經接觸過864嘅，864原本個版本，同埋864後期嘅版本係有少少唔同，咁所以--或者我哋搵番出嚟畀你睇，因為我哋唔係考記性。

許偉強先生：應該19.1嘅tab 121同埋122。

主席：十九點幾話？對唔住。

許偉強先生：19.1。

答：C19.1。

許偉強先生：C19.1。

主席：第幾頁呀？對唔住。

許偉強先生：係，tab 122，應該係10427。

主席：呢個就係10427，正確。呢個係水務署畀我哋㗎嘛，係咪？

許偉強先生：係。

主席：得。呢個就係我相信係 1983 年頒佈呀？

許偉強先生：呢個係 1983 嘅。

主席：係。

許偉強先生：嗄。

主席：我哋揭去 10428。

答：10428，係。

主席：10428 下面嗰度就有寫住"Amendments issued since publication"。

答：係。

主席：跟住下低有一個 "Amd No. 5651, April 1987"。我相--因為我而家--我曾經追查過，究竟 Table 17 係幾時出呢？因為 Table 17，就係如果你揭去 10444，就係 Table 17。

答：係。

主席：Table 17，就好 specific 就講到明 Tin/Copper，即係我哋講嘅 99C。

答：係。

主席:裏面嗰個 lead 嘅 composition 嘅 maximum 就係 0.1per cent，你睇到第四個 columns 呵？

答：係。

主席：係，第四個 columns。但是就呢個 Table 17，就係去到--即係好 specifically 講到話究竟個 maximum composition 係幾多呢，就係要去到 1987 年先至講。Where is between 1983 至 1987 年係曾經有過唔同嘅版本，嗰啲版本裏面，我相信都有講到話要用--唔准用 lead-free--即係要用 lead-free 嘅 solder，不過就冇寫

到明嗰個 solder 個 lead 個 maximum composition 究竟係幾多。因為我哋而家知道其實個所謂 lead-free 都有一個 maximum composition，即係畀你有--我相信係有啲雜質--有啲 lead 嘅雜質喺裏面。

答：係。

主席：你明我嘅意思嘛？

答：明，明。

主席：所以我就想問，當你喺 1983 年或 84 年，考呢一個 licensed plumber 嘅時候，如果你嗰個口試係要涉及你所講嘅水務條例，呢一個 BS--因為呢個 BS864，我哋知道一路用，用，用，用到而家水務署都冇改，畀人哋質疑佢點解唔 update。所以嗰陣時，係咪已經你哋考--當然你永遠唔知道個考官會考乜嘢嘢㗎。

答：係。

主席：啱唔啱先？但係當時係咪已經係喺個水務條例裏面，而你哋亦都係要 assort。可能你唔需要涉獵好多，不過你都要知道有呢樣嘢嘅存在喇？

答：當其時其實我哋--因為由我入行開始，其實當其時就當然冇而家咁強調嗰個焊料嗰個要求。

主席：係。

答：但係其實喺我哋個認知都知嘅。其實由我初初接觸嗰陣時，就係最主要--學嗰陣時，根本就學啲金屬嗰個特性，譬如金、銀、銅、鐵、錫，諸如此類。

主席：你講學嘅時候，係 1981 年你入學嘅時候？

答：係。

主席：唔。

答：當其時喺啲筆記入面應該都有講鉛係有毒性嘅。

主席：係。

答：因為做水喉，其實都會接觸鉛嘅，舉例，我哋條排水筒呢，即係俗稱叫堵接縫接駁方法。

主席：堵……

答：堵接縫接駁方法。

主席：係。

答：出面有啲人叫做黑鉛灌注法，即係堵黑鉛，打生鐵筒，其實嗰啲就係真係鉛嚟。所以當其時亦都係--喺八十年代，我哋其實都會意到鉛係對身體係有害。

主席：即係你一開始讀書，就已經知道鉛係有害？

答：係。

主席：咁你就知道有害，我返番去嗰個問題，即係換句話嚟講，你去到84年考個licensed plumber個試嘅時候，其實你都知道係如果係食水...

答：係。

主席：...--即係講緊食水供應系統裏面，就唔應該有含鉛嘅物料喺度，係咪咁嘅意思？

答：應該係。

主席：唔。好，你一開始讀書就知，你84年考過licensed plumber，跟住你係咪有曾經出過去出面做實務嘅嘢，即係？

答：有。

主席：有。咁好嘞，你做事嘅時候，真係落手落腳做嗰陣時候，當時候嘅工人又知唔知道呢一個咁樣樣嘅情況嘅？即係話做食水供應系統，就唔應該用啲含鉛嘅水喉又好、部件又好呢？

答：因為我係--其實我喺出面做實務嗰陣時，其實都覺得其實有啲工人就係會疏忽咗嘅。

主席：係。

答：嗄。

主席：即係有啲知，有啲就唔知？

答：係。

主席：唔，得，好，唔緊要。但係 licensed plumber 有冇話唔知呢？

答：應該嚟講，如果譬如你 licensed plumber，應該嚟講，對個水務嗰個知識，同埋水務嘅條例應該都有一定嘅認識。

主席：係。

答：本身我自己嚟講，我就有認識嘅。

主席：係。

答：嗄，咁都--都...

主席：啱嘞。

答：係。

主席：因為你就經過嗰三年喺工專，工業學院裏面嘅正式訓練，我哋知道有一啲 licensed plumber 就係冇經過呢一啲--你知唔知有一啲...

答：明白，知。

主席：...冇經過呢啲正統嘅訓練？即係學師一路咁樣樣上嚟，跟師傅咁樣樣？

答：知。

主席：即係你嘅認知，嗰一批嘅 licensed plumber，佢哋又對食水系統裏面唔可以含鉛呢一個咁嘅概念，又清唔清晰，或者知唔知道？

答：因為其實一般嚟講，如果身為一個即係專業嘅水喉匠咁計，應該嚟講，喺我嚟講，我覺得--即係我自己本身我都係認知，係知道嘅。

主席：要有認知。

答：因為其實你係應該係全面咁樣係做個水務工程。

主席：咁...

答：但係當其時可能會有啲人士都會有，會有疏忽，或者可能嗰個知識係都會有唔足夠。

主席：唔，得。

問：我想問一問，就係你口供嗰度講，1984 年開始，你就正式成為持牌水喉匠。

答：係。

問：你剛才都答主席嘅問題嗰陣時，都話你有做過實務工作。

答：係。

問：我想問下，你所講嘅實務工作，係咪即係話你喺啲工程入面，就真係擔任作為一個持牌水喉匠嘅角色？

答：唔係持牌水喉匠角色，實務嘅工作，係我真係做過技工。

問：技工？

答：係。

問：唔。即係真係自己落手落腳做，係咪？

答：落手落腳做。

主席：即係你考到個 licensed plumber 之後，就未正式開始做 licensed plumber 嘅工作，就係喺地盤或者係--我唔知喇，就做技工嘅，係咪咁嘅意思呀？

答：係，因為其實我考到 licensed plumber 之後，其實我都係同一啲嘅判頭啲公司，係做過水喉技工。

問：明白。

答：嗄。

問：水喉技工嗰個工作範圍，有冇包括話嗰啲水喉焊接嘅工程？

答：有。

問：都有嘅？

答：有。

問：咁你當年，就係如果你 1984 年嚟入行，當時做緊啲水喉焊接工程，可唔可以介紹一下係邊類型嘅水喉焊接工程？

答：水喉焊接工程，當其時因為就比較流行都係入面有錫嘅。

問：唔。

答：即係有錫 ring 喺度，我哋加熱，跟住等佢係焊接。

問：即係內置咗有錫嘅？

答：內置嘅。

問：即係嗰啲錫曲咁樣，係咪呀？

答：嗄，嗄，嗰啲曲嗰啲。

主席：即係 84 年開始已經有用銅喉嘅經驗？

答：有㗎嘞。

主席：唔。

答：唔。

問：當時你做嗰啲工程項目，係一啲私人工程項目，定係即係有關政府工程項目？

答：當其時應該嚟講會有啲係私人，有啲就係好似以前啟德機場啲

canteen 咁嗰啲。

問：明白。你作為技工做咗幾耐嘅？

答：大概都係做咗兩、三年嘅。

問：兩、三年嘅？

答：嗄。

問：唔。做技工嘅時候，有冇話接觸過係需要用呢啲焊料去到接駁銅喉嘅工作？

答：有。

問：即係唔係話內置焊料，即係我哋講緊用啲錫料。

答：要--即係冇錫 ring？

問：係，冇錯。

答：當其時就少嘅，當其時少嘅。

問：少嘅，但係都有做過？

答：我就冇做過。

問：但係你--例如你參與嘅工程入面，有冇見過啲工人做過呢樣嘢？

答：都冇。

問：都冇。

主席：嗰陣時你哋用內置嗰啲。

答：係。

主席：做完之後，有冇話需要喺外面--因為譬如測試嘅時候唔得，又或者漏水，要喺外面再補一層錫料？

答：其實當其時雖然內置咗錫圈嗰啲配件係好流行，但係因為好多師傅，

其實我哋都睇到，因為其實個技術，其實你燒--走錫嚟講，個技術係好緊要。即係話你如果技術係做得好嚟講，原則上就係唔需要外置錫畀佢，因為就睇下你個技術。但係如果係技術唔好，你可能會漏水，或者諸如此類，佢可能就會係補啲錫落去，會有咁嘅情形。

問：當年你做嗰個內置錫料，嗰啲錫曲，有冇話係即係嗰個成份要用無鉛，定係有鉛，呢方面你當時知唔知？

答：因為當其時我都知道--佢好多時嚟啲配件，好多時都係跟譬如 BS864 咁樣。其實好多時喺我讀書，同埋我接觸到水喉嗰陣時，其實佢入面好多時你見到啲包裝啲盛，好多時都註明話跟咩嘢標準。譬如舉例我哋嘅鍍鋅管，佢會喺喉上高打明係跟 BS1387 咁樣，咁樣。

問：即係你當年例如做緊嘅時候，如果用緊內置嗰啲錫曲，即係你都會見到包裝入面即係有註明...

答：有。

問：...係符合英國標準咁樣嘅，係咪？

答：有。

問：我想問下你就係做呢個技工兩、三年之後，有冇話正式喺啲工程項目入面擔任即係持牌水喉匠嘅工作？

答：冇。

問：都冇。

主席：即係換句話嚟講，如果係陳生你咁講嘅話，即係其實喺八十年代，如果你係有做水喉安裝接駁工程嘅話，就算你讀書冇讀過 864，但係當你做呢啲咁嘅焊接，呢啲咁樣樣嘅配件嘅時候，你都會有機會係接觸到呢個譬如你頭先講嗰啲配件，已經寫晒 864㗎嘞。

答：係。

主席：咁你都會知道嗰啲係已經係有晒錫料喺度，而嗰啲錫料又係安全嘅錫料嚟個囉喎？

答：應該就係，因為好多時你--當其時都係靠睇個包裝，同埋睇佢嗰個label咁樣。

主席：唔。

問：即係主要睇個包裝，即係如果有講及過英國標準嘅，當時你哋嘅認知就覺得應該都係符合即係水務署個標準咁樣？

答：係，即係買嗰陣時信佢--因為要信個供應商。

問：明白。

主席：呢個就係個工人，如果係個 licensed plumber，就應該更加知道，因為佢理論上就比工人嘅學識更高一級㗎嘛。

答：係，應該佢認識會更加清楚。

主席：唔。

問：就住話我哋一路講嗰啲焊料，即係唔係話內置，...

答：係。

問：...即係真係要喺做嗰個焊接工程嗰陣時，係加焊料落去嗰啲焊料，我哋就聽過有唔同嘅叫法，有錫線、錫條等等。

答：係。

問：我想問下你，呢啲咁樣嘅焊料，我哋先講，即係唔好理佢咩嘢名稱先。

答：係。

問：呢一種嘅焊料，就唔係話內置嘅，你幾時開始第一次接觸？

答：應該一般嚟講，如果我記得，應該係87年咁上下。

問：87年咁上下？

答：嗄，嗄，嗄，嗄。

問：當時你都係做緊技工嘅，定係...

答：當其實我都係做緊技工。我當其時係喺香港電燈公司入面做技工。

問：明白。

答：係。

問：係咪喺即係你參與嘅工程入面，即係接觸過呢方面嘅焊料？

答：當其時我係主要係負責南丫島發電廠入面物業嗰個維修，當其時係有接觸過。

問：係。即係...

主席：物業嘅維修，係食水嗰方面抑或係所有嘅嘢？

答：食水。

主席：淨係食水啫？

答：食水同埋排水，供排水。

主席：食水同埋排水？

答：即係水喉技工嗰啲嘅工作。

主席：得。

黎先生：需唔需要你嗰個專業資格，係持牌水喉匠㗎，份工作？

答：當年我考入去嗰陣時，佢就要求㗎。

黎先生：要求嘅。即係要求你係...

答：要求我有持牌水喉匠嘅資格先至請我。

主席：唔。

黎先生：哦，即係雖然你自己本身未做過持牌水喉匠，但係你個持牌水喉匠嗰個資歷呢，就係作為嗰份電燈公司嘅工作係需要嘅？

答：係。

黎先生：Okay。

問：即係你當時就係嗰個公司嘅僱員嚟，係咪？

答：係。

問：唔。咁就你喺嗰個--即係你接觸嗰個工程，即係你講嗰個維修嗰方面，就有冇自己話用過呢啲咁樣嘅焊料？

答：有。

問：都有嘅。你當時接觸嗰個，係咪--有冇見過係咪呢一隻？

答：諗...

主席：無鉛都未必係...

問：諗六...

主席：...呢隻牌子嘅，係咪？

答：未必係呢隻，但係當其時我哋買就係無鉛嘅。

問：買係無鉛嘅？

答：嗄，你話係咪呢一隻，應該就--嗄。

問：明白。

主席：未必係嘅，因為呢間公司都轉過好多次手。

答：係呀，係呀。

主席：唔。

問：但係就知道買番嚟係即係無鉛嘅？

答：係。

問：你從何得知買番嚟嗰啲係無鉛㗎，當時？

答：因為佢好似你呢隻咁嘅錫線，佢會有 label，同埋好多時喺我哋買嘢嗰陣時，出單嗰陣時，我哋係註咗㗎嘛。

問：唔。當時你接觸過嘅呢啲你所講嘅無鉛焊料，係一卷卷定一條條㗎？

答：當其時我接觸嘅無鉛焊料就係一卷卷。

問：一卷卷嘅都係？

答：係。

問：唔。

主席：有冇接觸過一條條嘅呢，其實？唔好計有啲工人將佢剪咗出嚟嗰啲先，唔好計，呢啲其實都係沿住一卷卷嘅，有冇啲係無鉛焊料，一嚟就已經係一條條嘅？

答：一條條嘅焊料其實我有接觸過，但係你話佢係咪無鉛，好多時我哋都要睇番佢嘅包裝。但係其實我哋呢就係--因為錫條嚟講，好多時就係

--以前就係未有咁流行嘅錫線，就會用錫條，錫條嚟講，因為比較--個工序會多少少。因為你要燒溶佢嚟倒番出嚟，齊薄啲咁嚟用。

主席：問清楚啲先，就係你嘅意思即係以前--就未有呢個一卷卷之前，都已經有一啲無鉛嘅錫條一條條係咪咁嘅意思呀？唔係？

答：當其時我就唔敢肯定有冇，因為當其時我哋用嘅最主要都係內置錫曲。

主席：係，得。即係當你用無鉛嘅焊料嘅時候，就已經係一條條--一卷卷，係咪咁嘅意思？

答：一卷卷，係，係。

主席：冇錯。

問：剛才你都有提及過，你都有見過啲一條條嘅。

答：係。

問：即係都有嗰啲包裝，係咪？

答：有。

問：我想問你，你話都要睇包裝先知道佢嘅成分係點。

答：係。

問：當時你接觸一條條嗰啲，我哋叫錫條先喇，嗰陣時個包裝入面，有冇話--即係寫住係有冇鉛㗎，個...

答：當其時我見到有啲師傅都係會用嘅，但係有啲入面係會有鉛嘅成分其實。

問：有鉛嘅？

答：嗄。

問：即係如果你見到一條條嗰啲，以你嘅記憶嚟講，即係嗰啲嚟嘅焊料，一條條嘅，就係有鉛嘅？

答：有啲係有，我相信有啲可能都會冇。

問：有啲有，有啲冇。你話你相信有啲係冇，係你見過有啲包裝嘅錫條係寫住「無鉛」，定係即係你聽番人哋講話可能有啲錫條係無鉛咁呀？

答：因為嚟講，錫嚟講，其實有冇鉛呢，其實好多時就係視乎佢質量嘅啫。其實我哋買錫線，或者買錫條，其實返嚟有機會都係有鉛或者無鉛。

問：係。

答：其實係要--因為個形狀其實係唔會影響個質量。

問：明白。

答：當然你話你買嗰陣時，「我要無鉛嘅」，當然你就需要個標準就係無鉛。

問：當時你話你有接觸過錫條，亦都知道係即係錫條有啲包裝完都--即係你知道係有啲係有鉛嘅嗰啲，咁你有冇接觸過，例如話錫條就用咗喺啲即係供食水喉嘅工程入面？

答：我就冇接觸過。

問：冇接觸過？

答：冇接觸過。

問：唔。

主席：即係你講有鉛嘅錫條，係咪？

許偉強先生：有鉛嘅錫條，係。

問：因為你自己所...

主席：我想問一問，因為你--即係你其實喺你呢個 course work 都有提到，就係話銅管其實就唔單只係愛嚟做水喉用，亦都可以暖氣，同埋做輸氣，你呢度有咁講。

答：係，係。

主席：熱水喇，同埋。咁暖氣，我明白喇。另外輸送氣體係咩嘢？即係煤氣、石油氣嗰啲，就係用銅管去輸送，係咪咁嘅意思？

答：如果喺香港嚟講，有機會你煤氣、石油氣，有陣時你駁爐具嗰陣時佢都會用。同埋有陣時我哋有啲儀器，譬如我哋前一排實驗室入面有啲儀器，我要駁啲氣體畀佢，有機會都係要用銅喉。

主席：或者譬如氧氣、氫氣嗰啲咁嘅樣？

答：係。

主席：或者嗰啲乙炔嗰啲咁嘅樣嗰啲，...

答：係。

主席：...即係喺個實驗室裏面？

答：係。

主席：咁個...

答：因為佢有啲儀器可能要用啲氣體供應佢，...

主席：係，係，係，唔。

答：...愛嚟做實驗咁樣。

主席：係。咁嗰啲，你就用銅管，不過就可以用有鉛嘅焊料去做焊接，因為唔牽涉到食水，係咪咁嘅意思呀？

答：係。因為譬如好似冷氣咁嗰啲--譬如冷氣，或者譬如我哋 radiant heat，一啲地熱嗰啲，即係暖氣咁樣。

主席：擺喺地下嗰啲暖管？

答：嗄，即係好似外國，佢咪有啲暖氣咪行地下，...

主席：係，係。

答：...跟住散發上嚟。

主席：係。

答：因為嗰啲應該嚟講，你唔會愛嚟飲用㗎喇，其實嗰啲就應該係你用有鉛嘅，其實都冇問題嘅。

主席：唔。

問：當時例如你講緊用一卷卷嘅，即係我哋叫錫線。

答：係。

問：你當時個用法，有冇話即係將佢喺個卷嗰度剪一條條出嚟用，定係就咁成卷咁用？

答：我自己？

問：係。

答：我自己嘅慣性，我通常就成卷嘅，成卷咁用。

問：唔，係。但係呢個話--因為我哋聽過有啲工人嘅講法，就話都普--有啲幾普遍嘅做法，就係將一卷剪成一條條咁樣用嘅，呢個你有冇睇過人哋係咁樣用？

答：其實我嘅理解，你一卷剪到一條條，就可能佢覺得係方便。因為你覺得嗰卷錫呢，如果成卷嚟講都幾重下。

問：係。

答：如果佢成日咁拎住，可能覺得就會冇咁方便。剪開嚟講，其實就會輕身啲。

問：即係以你所知，呢個都係一個即係水喉工人即係一啲比較普遍嘅做法㗎嘅，係咪，剪成一條條？

答：都會有人咁樣做嘅。

問：好。

許偉強先生：主席，係。

主席：或者我哋朝頭早休息二十分鐘先。

答：好。

主席：二十分鐘之後我哋再繼續，陳先生，唔該晒。

上午 11 時 33 分聆訊押後

上午 11 時 54 分恢復聆訊

出席人士如前。

職業訓練局第二證人：陳子健（職業訓練局導師）宣誓繼續作供
許偉強先生繼續盤問

問：陳生。

答：係。

問：咁我哋繼續討論一下，就係就住你作為一個持牌水喉匠咁講。

答：係。

問：咁我想問一問，你自己本人，我知道你就話冇喺啲工程項目嗰度，就真係正式擔任過持牌水喉匠呢一個職務。

答：係。

問：我想問一問你，有冇接觸過係即係持牌水喉匠佢需要負責簽嗰啲我哋所謂水紙？即係 WW46 嗰啲 form，你自己有冇即係接觸過、處理過？

答：我冇處理過，...

問：你冇處理過。

答：...但係我哋即係會有個認知。

問：明白。

答：當其時會有認知，但係我冇接觸過。

問：咁我想問一問你，都係就住你作為持牌水喉匠。咁我哋睇法例，就我哋見到現行嘅水務條例，咁都係講持牌水喉匠嗰個工作範圍、性質。

答：係。

問：或者我哋睇一睇，就其中一個就喺 G1 嘅 229 頁。

答：係，睇到。

問：條例嗰度就係咁講，就係話如果我哋睇番呢個第 15 條嘅(1)嗰度。

答：係。

問：咁佢講「任何人不得建造、安裝、保養、更改、修理或移動任何消防供水系統或內部供水系統，但持牌水喉匠或者係水務監督授權的公職人員，就可以則屬例外」咁。咁呢度就似乎就係講緊即係話持牌水喉匠，就即係佢係可以有權就係做呢方面嘅工作咁。第二就係咁講「水務監督認為是性質輕微的消防供水系統或內部供水系統的更改或修理工作，或者係水龍頭嘅更換墊圈嘅工作，可由不屬持牌水喉匠的人或不屬水務監督授權的公職人員的人進行」咁樣。咁就如果任何人違反，都係屬犯法嘅咁。

答：係。

問：呢個你都即係應該有認識，對於呢方面嗰個工--即係持牌水喉匠，即係佢哋可以做啲咩嘢工作咁樣，...

答：有認識。

問：...呢方面你有認識？

答：有認識。

問：或者我哋再睇一睇多一個文件，我先至向你跟進下一啲問題。如果你睇下我哋 C3，C3 2422。如果你唔係話太過熟悉呢個文件，我可以先同你簡單介紹下呢個文件先。就呢個就係水務署發出嘅一個

circular，咁就係90年9月4號。

咁我想睇一睇個內容，咁就佢呢度就係講話：

"There have been instance where licensed plumbers withdraw from the plumbing work of a project and ask other person to take over the work without notifying the Water Authority."

即係佢話有啲情況就係，啲持牌水喉匠就即係自己冇直接去參與，咁就即係叫人去參與一啲嘅水喉工程，亦都冇通知到水務署。

"I like to remind you that you should not hand over the plumbing work for which you have signed Waterworks Form 'G' to any other person so as deem to transfer the responsibility for supervising the work unless the person to take over is himself a licensed plumber and has obtained the approval of the Water Authority through submission of a fresh Waterworks Form 'G'."

跟住就"So long as you remain to be the licensed plumber of a particular job for which you have signed Waterworks Form 'G', you may employ workers who are not necessarily licensed plumbers to assist you in carrying out the work. But under no circumstances should you use your licence to enable non-licensed persons to undertake plumbing work without involving yourself in the supervision of the work."咁。

即係呢度基本上都係提醒番啲持牌水喉匠，就話就住工程方面，你可以就係請其他人做，不過你仍然係需要做一個--即係確保一個監督嘅工作咁樣。

答：係。

問：咁我想問一問你，就係即係以你作為持牌水喉匠嘅認識，就係其實持牌水喉匠佢個工作嗰個範圍，其實佢真係要自己落手落腳去做啲我哋所謂major。即係除咗啲minor喺嗰個條例入面講啲性質比較輕微嘅工作，持牌水喉匠要自己落手落腳去做，定係話即係你哋個工作範圍，係最主要係監督啲工人去做有關嘅水喉工程？

答：其實持牌水喉匠就可以係自己落手落腳做。

問：係。

答：亦都係可以有啲公司係請啲持牌水喉匠就負責幫佢去跟一啲嘅工程咁樣。

問：明白。

答：即係話佢可能要負責管理、監督諸如此類。咁但係有啲細嘅工程，可能就個老細就係持牌水喉匠，但係佢接工程返嚟，通常都係自己做番。

問：係。即係兩種都會有嘅，係咪？

答：都有。

問：唔。咁就住嗰個你自己嘅認識，對於持牌水喉匠嗰個工作，咁就係如果係作為一個水喉工程嘅監督嘅時候，通常持牌水喉匠佢哋需要係即係做啲咩嘢工作，最主要喺個日常地盤嗰方面？

答：其實如果一單工程入面，如果身為一個持牌水喉匠咁樣，咁如果佢係譬如細單嘅，咁佢本身根本就係自己負責晒，咁即係話佢所有嘢，譬如入紙水務署、訂料同埋做嘢，同埋監管佢啲工人咁，全部都要佢自己做。

問：明白。

答：咁但係如果有啲大嘅公司，就係可能就請啲持牌水喉匠返嚟，就負責管理個工程，咁可能佢就未必落手落腳做。咁但係佢應該嚟講，佢都要監管住下低個進度，同埋我幾時入表、幾時報完工、幾時驗水咁樣，呢啲全部佢都要跟進番。其實物料、所有嘢應該嚟講，因為佢身為一個持牌水喉匠，佢其實就係要負責嗰單工程，所以應該嚟講--簡單啲講，佢應該喺嗰單工程入面嘅水喉嘅項目，佢應該係熟悉。

問：明白。我哋睇一睇番你證人口供裏面講嘅內容而家。咁就其中我想問一問你，就澄清有幾點嘅啫，喺你嘅證人口供，即係W1嘅第773頁第9段。第9段呢...

答：等一陣，未搵到。

問：係嘞，唔好意思。

答：773？

問：係嘞，7--對唔住，737頁。

答：係。

問：係嘞，第9段。

答：係。

問：咁你都介紹咗有即係一啲唔同嘅講義。

答：係。

問：咁其中有Annexure 1、Annexure 2、Annexure 3咁。

答：係。

問：我就想睇一睇嗰啲講義嗰個--即係個年份，我想搞清楚先。如果我哋睇下你所講Annexure 1，就係有講有關即係啲唔同嘅金屬，alloys等等嗰啲plastic materials，我哋睇下745頁。

答：係。

問：咁就呢度就係你所講，應該係就住2004年嗰個課程嘅講義嚟，係咪？

答：而家呢份有啲就係2004，其實呢份--而家我個證人供詞附上嗰個附件，其實嗰啲筆記已經係更新過，已經係最近。

問：已經全部都係更新咗？

答：但係有一部分係--即係有部分係更新咗。

問：有部分係更新咗，係咪呀？

答：係嘞。譬如舉例，我哋嘅焊接呀--等我睇睇。舉例。問：係，

答：詼要...

問：如果你焊接嗰度，就喺790頁。

答：係嘞，790頁。

問：係。

答：咁嗰度你見到我哋已經係更新咗，係跟--因為水務署就喺2015年就出咗都好多通函，咁我哋去到1至9咁，其實我哋都緊貼住佢就其實都更新咗，咁你見到就係同之前嘅筆記係有分別嘅。

問：係。我哋睇一睇，就另外你有個 Annexure 2，Annexure 2 就係750頁開始。

答：係。

問：咁就亦都係講"relevant teaching notes on different types of pipes"咁。

答：係。

問：咁我嘅理解，呢一個講義，亦都係2015年更新咗嘅，係咪？因為似乎如果我哋睇番喺758頁開始，講及嗰啲英國標準嘅時候，就如果我哋睇下例如760頁。

答：係。

問：就引用一啲英國標準，個年份係2015年。

答：係。

問：所以我嘅理解，就係應該呢一份都係即係你哋最近更新嘅？

答：係，呢份最近更新。即係所以而家其實我哋夾附喺度嘅所有嘅筆記，即係呢幾份嘅筆記，都係喺最近更新過。

問：冇錯。咁你之前嘅筆記，以我所知，就係應該冇一個咁嘅列表就係列晒嗰啲英國標準出嚟，係咪？

答：當其時係冇。

問：係嘞。

答：舊嗰份係冇。

問：唔，好。咁就如果我哋睇番你證人口供嘅第 11 同埋第 12 段先，喺738頁。

答：係。

問：咁呢度講就話第 11 段"topics on soldering (are) set out in the syllabi of (i) module 'Pipe Work Installation at p.38 and (ii) module entitled 'Plumbing Practice I(A)' (at) p.46 of 2004 Course Scheme."

答：係。

問："I confirm I have taught the students about soldering and soldering materials and enclose copies of the relevant TLP distributed to the students during the Course as **Annexure 4** for the ease of reference of the COI."

如果我哋睇番你所講嘅 Annexure 4，就係 789 頁。

答：係。

問：咁就呢個就係你講緊，就係話你個 distribution，就係 2015 年更新咗之後嘅課程嘅 distribution。

答：係。

問：咁我咁樣理解啱唔啱，就係--因為我尋日都問過盧先生，就係如果我哋睇番，如果我哋由一九--對唔住，2015 年更新咗嗰個課程之前嘅課程。

答：係。

問：如果我哋講番之前嘅 266 同埋 268 嘅課程，咁都係冇特別就住焊料需要用無鉛呢樣嘢，係即係作一個好清楚嘅介紹，咁呢方面你同意嘛？

答：266、268 就係應該嚟講，佢焊料就冇好強調咁講，咁但係就其實你見到好多時就水喉工程嚟講，你見到一入門嚟講，佢就會教金屬嘅。其實金、銀、銅、鐵、錫，又會講咗係譬如常用嘅銅同埋錫。因為喺銅同埋錫嚟講，喺水喉行嚟講，係用得係好多，鉛都係會用得好多。

問：明白。

答：咁所以佢就會介紹佢嘅特性。

問：係介紹金屬嘅特性？

答：係。

問：同埋亦都有介紹即係焊料可能有唔同嘅種類咁樣，係咪？

答，係，有，有講。

問：但係就即係冇特別好似畫公仔畫出腸咁樣，就直接去講話要用無鉛焊料，即係呢個就係之前課程，如果我哋睇文件上就似乎係咁樣？

答：因為當其時如果你講 0286、0288 嗰啲，就當其時好多時上堂，好多時就老師就係派筆記。即係因為其實我哋呢套 TLP，都係 2001 年開始係有，咁之前嗰啲好多時老師授課都喺堂上，可能抄黑板，可能派啲筆記咁樣，咁同埋口述。因為當其時嗰個技術，教學嘅技術就係咁樣。

問：明白。咁我...

主席：即係你嘅意思即係當時都已經有教，係咪咁樣樣嘅意思？

答：當其時--你話焊料嗰度，應該都會有講，咁你話佢有冇好強調咁樣講，我就--因為都成三十幾年，我就唔係好記得。

主席：九...

答：咁但係佢又有講，就係嗰啲金屬嚟講係有毒。即係鉛嚟講係有毒，咁既然係咁，如果我哋用嘅焊料，咁如果含鉛，就即係話唔可以用落食水。

問：唔。

主席：即係冇好似而家咁樣樣畫公仔畫出腸，就寫咗喺個(TLP)嗰度，不過嗰陣時嗰啲都有講？

答：啲老師即係上堂就會...

主席：有教？

答：...有講。

問：好。或者我哋睇一睇你嘅第13段嗰度所講，...

主席：或者我想睇下你，其實第4段，你就已經講，你就話你2001年就join呢個VTC。

答：係。

主席：咁就做instructor。

答：係。

主席：就係喺啲工場嗰度教啲學生落手落腳做？

答：係。

主席：係咪呀？

答：係。

主席：就係做水喉？

答：當其時就會--如果2001年嗰陣時，其實我哋都會有--我本身教就會有教。因為其實我當其時嗰個部門就係屋宇裝備，Building Service。

主席：係呀。

答：其實我會有教白鐵同埋水喉，同埋消防咁樣。

主席：係，樣樣都有教？

答：嗄，嗄，即係屋宇裝備嗰啲。

主席：咁教水喉嗰陣時，已經有教點駁水喉嗰啲，有冇教？

答：有。

主席：咁嗰陣時係用各種唔同嘅方式去接駁水喉都有教？

答：有。

主席：其中一樣就係走錫？

答：走錫，係。

主席：咁走錫嗰陣時，你做 instructor 嗰陣時候，咁個 syllabus 可能唔係好似頭先許大律師咁講，冇好明言。

答：係。

主席：咁你做 in--我哋聽到就話「啊，practical 就一定有教㗎嘞，instructor」。

答：係。

主席：咁你有冇教，請問？

答：有。

主席：就有話--有教佢哋乜嘢？

答：有教佢哋，譬如啲焊料，咁我哋應該係點樣選擇。因為當其時我哋已經知道係用喺食水系統入面嘅焊料或者物料或者喉管，都應該係唔含鉛。

主席：係，即係嗰陣時已經有教嘞？1991 年開始已經有教嘞--唔係，對唔住，2001 年。

答：二零零...

許偉強先生：2001。

答：係，有。

主席：得，得。

問：我想問一問就係2001年開始，你就話即係開始有教即係有關水喉方面嘅課程。

主席：佢呀，佢呀，佢。

問：係咁，你，你自己，係有教喇。

答：係。

問：咁就但係至於你話嗰兩個相關嗰個三年嘅課程，266、268，你就應該係2006年開始先至教嘅？

答：應該零二--六六零二八六嗰陣時應該就唔係八六嘅--唔係06嘅。06年嗰陣時已經係55776。

問：係嘞，即係55776同埋53776喇。

答：係嘞。

問：即係前身就係266、268喇。

答：係嘞，前身就係266、268。

問：好。咁我想問一問，首先就係你2001年開始做instructor嘅時候，你教例如話用啲咩嘢焊料做水喉接駁工程物料咁，你本人有冇示範去做一個例如銅喉嘅接駁工程㗎，喺個教成個課程入面？

答：有。

問：都有嘅？

答：有。

問：你做示範嘅時候--我哋唔好講睇 video 住，淨係講你自己親身做示範嘅時候，係就係用邊一類型嘅銅喉㗎？

答：銅喉？

問：即係我哋講緊接駁係用例如攢杭吖，定係用即係錫焊...

主席：樣樣都要教吖嘛。

許先生：係嘞。

答：兩樣都有。

問：兩樣都有嘅？

答：係。

問：咁你嘅示範呢，你嘅示範係兩樣都有示範嘅？

答：兩樣都有。

問：係咪？咁你當時做例如用錫焊嗰啲咁嘅--個 demonstration，即係示範，係用啲乜嘢焊料㗎？

答：當其時做 demo 嗰陣時，因為當其時我哋都係用緊內置錫圈嗰啲配件嘅。咁但係喺示範之前，咁我哋因為其實--其實有鉛嘅錫線係好容易買到嘅。因為你見到好似電器，咁好多啲焊，電子零件，其實你去啲電子舖就好容易買到嘅，所以亦都係無鉛錫線嚟講，我哋亦都係都係買到，但係就冇有鉛錫線，即係電器用嗰啲，咁容易買，咁所以好多時我都會係畀兩卷佢睇，「嗱，呢卷係冇鉛嘅，呢卷有鉛嘅。」咁我跟住就詳細話畀佢聽嗰個--即係我哋做 demo 之前，我哋都會同佢講一輪，譬如嗰個認知，要注意嘅嘢咁樣，會同佢哋講嘅；咁講完，跟住就同佢哋做。

問：唔好意思，停一停，我想搞清楚啲細節嘅啫。

答：係。

問：就係你做 demo，係做緊啲內置有錫料嘅 demo，就係點樣去即係焊喇。

答：係。

問：咁就喺做呢一個咁樣嘅示範，即係用內置嘅錫曲做示範嘅時候，係咪已經展示過嗰啲咁樣嘅即係唔同類型嘅焊料畀學生睇㗎，當時？

答：係。

問：當時你話一隻係有鉛、一隻係無鉛，兩隻都係卷狀嘅，定係係唔同形狀㗎？

答：兩隻都係卷狀。

問：兩隻都係卷狀嘅。喺嗰個物件嘅外表，有冇話用顏色或者係用牌子分得出係邊一隻你所顯示示嘅，邊一隻有鉛，邊一隻係無鉛㗎？

答：因為牌子，我哋一般嚟講，教學嚟講，我哋就唔會提牌子嘅，因為避免同佢宣傳。咁一般嚟講我哋都係最主要教佢睇個色澤，睇個色澤。

問：首先，你講嘅色澤就係直情講緊嗰個錫料色澤嘞？

答：係，即係不含鉛嗰個錫料嘅色澤同埋含鉛錫料嘅色澤。

問：我哋暫時未講到錫料嘅色澤之前，如果你揸住嗰兩卷嘢，從嗰個外觀上，即係佢個包裝，一卷卷，佢會唔會都有顏色嘅分別㗎，當時？

答：包裝顏色，我哋一般嚟講就好少話去睇個包裝顏色，因為可能間間嘅供應商同埋牌子嘅顏色都可能有佢特性嘅。咁我哋最主要就睇個 label，即係話佢好--每一卷錫上高會有個 label 貼喺度咁樣。

問：係。咁你有冇同學生講解過 label 入面嘅內容呀？

答：有。

問：當時你攞住呢兩種咁嘅焊料，你點樣稱呼佢哋㗎？

答：都係--因為我哋最主要強調要佢知道有啲錫料就係用喺水喉度嘅，有啲就可能用喺電器或者其他嘅，咁亦都話入面成分係講咗係無鉛嘅。因為亦都同佢哋講番，因為我哋--雖然當其時我淨係教工場，但係都會有啲理論同佢哋講，就話鉛對身體係有害嘅。咁唔單只係喺供水系統上面，咁我哋會舉例，譬如屋企鬆鐵閘，咁可能用啲底油。咁底油其實有啲都係含鉛個喎。咁我哋都會提醒佢嘅。提醒佢，「譬如你摸完之後，你要洗手，因為如果唔係，你可能跟住食嘢，可能你都會有鉛嘅毒素係滲到畀佢。」咁我哋都廣泛咁樣同佢哋講一講，即係加深佢認識囉。

問：咁我想問下就係即係你當時講解話呢啲料嘅不同之處，即係亦都有佢嘅危險。

答：係。

問：咁你作為導師，係咪都覺得即係呢一個咁嘅課題都係重要嘅課題嚟嘅，即係需要同學生詳細去講解嘅？

答：重要，當然重要喇。

問：咁你哋除咗口講，示範嘅時候口講之餘，有冇話再畀啲例如附加嘅一啲講義畀佢哋，去介紹啲唔同嘅物料，等佢哋再詳細啲有個認知呢？

答：附加物料，我哋就冇畀佢。咁但係好多時我哋都係跟番--就有啲同學可能個認--即係嗰個尋求知識會認真啲嘅，咁我哋就會都--舉例，畀啲英國標準佢去參考下。

問：明白。

答：或者叫佢去啲學會，咁聽下啲講座咁樣。即係我哋都會提番佢哋應該要都增值自己。

問：明白。英國標準嚟講，就即係我知道你哋冇話當時做一個列表出嚟話即係唔同嘅部件係點喇。

答：係。

問：咁所以就會即係可能係期望學生即係自己去做都係少少研究，即係睇下英國標，「喂，究竟係要符合啲乜嘢規格嘅」咁樣，係咪？

答：係。

問：你剛才講到話嗰兩種物料，睇個色澤就可以分到即係邊啲有鉛，邊啲無鉛。

答：係。

問：可唔可以講一講畀我哋聽，即係你當時同學生介紹嗰個色澤上面嘅分別係點樣呀？

答：一般嚟講，我哋做開工程嘅都睇到，如果一般嚟講係不含鉛嘅錫線，佢嘅光澤係比較光啲嘅。咁但係如果含鉛嚟講，佢嘅光澤係啞色啲。

問：不如我哋就睇一睇實物先喇，如果我哋--或者我攞畀你睇一睇...（聽不清）咁如果--可唔可以話一話畀我哋聽，點樣去到分辨嗰個光澤上面嘅不同？

答：當然，你而家兩條嚟講，亦都係含鉛嚟講，佢有個成分，可能有啲係含鉛重啲嘅。

問：係含鉛咩嘢呀？

答：含鉛嘅成分會重嘅

問：重啲，係。

答：咁但係有啲可能輕啲嘅。咁如果重啲嗰啲，咁我哋容易睇啲嘅。咁但係如果你，好似而家咁喇，就係難睇啲囉。咁當其時我哋教學，好多時就搵電器嗰啲，含鉛成分重啲嘅，即係畀佢容易啲識別。

問：你揸喺手，你右手嗰個錫條，就含鉛成分，我哋而家知道係50個per cent嘅。咁以你嚟講，咁算係重，定係算輕呀，50個per cent含鉛嘅話？

答：呢個呀？

問：唔係，你右手嗰個。

答：含鉛成份，如果50%，含鉛成分重㗎嘞。

問：重㗎嘞，係咪？

答：係。

問：咁如果含鉛成分重嘅諗，你從嗰個色澤上面個分野，點樣可以睇得出例如有鉛同埋冇鉛呀？

答：因為如果你攞耐咗少少，佢因為有鉛嚟講，佢氧化得係快啲嘅。

問：有鉛，氧化快啲嘅？

答：係嘞，咁佢就會啞色啲。當然你話好新嘅，，咁可能就難睇啲囉。

問：明白。咁所以即係如果就咁以色澤嚟講，都唔係咁易學生可以做一個判斷，從色澤上面去睇邊啲係有鉛，邊啲係無鉛嘅？

答：可以咁講。

問：係咪？

答：可以咁講。

問：咁除咗色澤之外，仲有啲乜嘢可以令學生第時做工程嗰陣時分辨到即係邊啲係有鉛，邊啲係無鉛呢？

答：當其時因為就--好似--當其時我講--當其時就惟有就係好多時我哋都係信個 label，同埋信個包裝入面打咗嗰個料資。咁但係而家你見到，我哋亦都係好多時我哋喺--自從鉛水事件之後，你發覺亦都係出咗好多嘅試劑，同埋嗰個試驗方法，咁而家就會準好多嘞。

問：明白。即係所以當時嚟講，就除咗你話有色澤嘅介紹之外，睇色澤就唔係話好準確喇，...

答：係呀。

問：...咁就亦都同佢哋講解一下個 label 上面嘅內容嘅，咁樣？

答：係。

問：係咪？咁我想問一問個年份嗰度，我想搞清楚，就係你剛才講嗰個，你嘅--做示範喇，就係 2001 年你正式加入呢個 VTC，咁就作為一個 instructor，咁你有做呢方面嘅示範嘅。

答：係。

問：咁你跟住 2006 年開始就有就嗰兩個三年嘅課程都有做 instructor，係咪？

答：係。

問：係咪？咁就我想問一問，就係就住嗰三年嘅課程，你做 instructor 嘅時候，又有冇喺呢一方面，即係講緊焊接水喉，銅喉，呢方面嘅工程有再作任何示範呀？

答：如果係 06 年陣時，其實我都係負責 55776，即係夜晚嗰個水喉全科班嗰個工場嘅，咁我都會有示範。

問：都有示範嘅。

答：咁喺 2010 年我就負責教 53776 嗰個理論，咁嗰度就冇示範嘞。

問：係。即係話你喺嗰個即係夜間嘅課程嗰陣時都有做類似嘅示範嘅？

答：有。

問：當時嗰個示範係咪話內置錫曲同埋話係即係燒焊，直情係咁樣加啲焊料落去做燒焊嘅，兩樣都有做嘅？

答：係。

問：都有做嘅？

答：有。

問：亦都係同樣嘅課程，即係介紹嘅時候，有冇咩嘢唔同呀，同 2001 年嘅時候？

答：因為其實個工藝都係咁樣示範畀佢哋睇喇，都係示範畀佢哋睇。

問：喺介紹有鉛、無鉛物料嘅時候，有冇啲咩嘢唔同呀，同 2001 年嘅時候？

答：都係相同嘅。

問：你確唔確認你 2006 年喺夜間課程，即係話做呢個講解或者做示範嘅時候，係有特別就住有鉛同埋無鉛係作一個即係特別嘅講解㗎？

答：有。

問：都有嘅，係嘞。亦都有攞兩種物物料出嚟畀同學睇嘅？

答：有。

問：咁我都想問一問嘅就係喺你哋夜間課程，咁我都睇過啲課程嗰啲大綱，嗰啲講義，咁一般嚟講，你做呢一個示範，係咪就係話你哋去到喺一啲即係水喉嘅課程，因為都有好多個環節嘅，就係尤其是講緊 soldering 嘅時候就會做呢方面嘅示範？

答：係呀，因為水喉嚟講，好多時喺--有一個學期嚟講，即係話 practical 1B 嗰度就主要都係教銅喉嘅接駁，咁我哋就會有示範攢杭，有示範走錫，咁樣。

問：呢個係嗰三年入面第幾年做？

答：第一年。

問：第一年嘅？

答：係。

問：你呢度，就喺你嘅證人口供W1，738頁。呢度你就話"I refer to paragraph 46 of Mr. Lo's witness statement and I confirm that although the TLP prior to July 2015 has not been amended to reflect the availability of various types of soldering materials in the market, I have taught the students to use lead-free solder for fresh water plumbing system during the class since I started teaching the Course. On top of the teaching notes, I have adopted a video produced by the Copper Development Center in my teaching."

呢度咁跟住就講嘞，"A copy of the video is attached... It is clearly stated in the video that lead-free solder should be used for potable water system"，咁喺邊一段時段，我哋尋日都睇咗㗎嘞，"Soldering materials with lead can be used for other purposes such as soldering for electrical wiring or sewage pipes."

呢度我想都同你跟進一下，就係你呢度講嘅就唔係你親身嘅示範嘅。你就係講緊就係播一啲嘅影片就畀啲學員睇。

答：係。

問：我想知嘅就係話如果我哋講緊你當時，如果係2006開始有教嗰個夜間課程，咁呢啲咁嘅展示呢一個咁樣嘅影片，咁會係同你嘅示範差唔多時間做吖，定係係即係隔開一段時間，係唔同㗎？

答：當其時06年嗰陣時都未用到套片嘅。咁用到套片嗰陣時應該嚟講就係2010年開始。

問：2010年開始？

答：係。

問：係。咁 2010 年嘅時候，你仲有冇就住即係點樣去接駁銅喉嗰方面，你自己做一啲親身嘅示範嘅？

答：如果係夜間嗰度，我就親身示範，就夜間有嘅。

問：有嘅？

答：因為夜間主要就係工場嚟㗎嘛，咁個導師就一定要做一次畀啲學生睇。

問：明白。

答：咁但係如果日頭，53776 嗰啲，咁我就會播套片，跟住從中就將個經驗同佢分享。

問：明白。咁所以即係夜間就係有示範，...

答：係。

問：...就冇片，就唔需要播片嘞？

答：06 年到到 09 年就係示範，但係冇片。

問：零六...

答：但係 10 年到現在，如果夜間，就係有片同埋有示範，咁日間就係有片加埋我嘅講解。

問：即係 10 年之後嗰個唯一嘅分別就係夜間就係有示範，亦都有片？

答：係。

問：咁就日間就係冇示範，不過有片，亦都有講解咁樣，係咪？

答：有講解，係。因為日間嚟講係喺課室，課室就唔係咁方便攞支噴燈喺度示範嘅。

問：明白。咁即係如果我哋講夜間咁嚟講，咁一定就係例如你播片同埋你示範係喺唔同時間做㗎喇？

答：播片同埋--一般嚟講，播片我就會第一堂--因為我哋好多時如果夜間嚟講，第一堂就會同佢講安全先嘅，因為樣樣最緊要就係安全。咁譬如你揸噴燈嚟講，諸如此類，咁你就要講晒嗰個安全。咁喺講安全嗰

陣時，我就播咗套片畀佢睇先嘅，咁即係話我哋跟住嗰個課堂就會教呢啲。因為喺工場嚟講，因為第一堂我就會同佢哋入一入我哋工場入面有個類似課室咁嘅，即係可以播片咁樣嘅，咁跟住同佢講晒之後，咁我哋出工場就開始就會--亦都係喇，咁我哋再會介紹啲嘢，同埋我會親身示範畀佢睇喇。

問：明白。即係通常嚟講，就係如果夜間課程，就係播咗片先嘅？

答：係。

問：然後你先至會親身做示範嘅咁樣？

答：係。

問：就未必喺同一日嘅？

答：有機會同一日，因為播完片之後可能個時間係有少少時間，咁我哋就唔會話停咗㗎嘞，跟住--因為你一定要示範咗，示範完會後，就先至叫佢哋自己落手落腳做嘅。

問：明白，明白。咁例如你播片嘅時候，我想知道就係你播完片畀佢哋睇，咁就你話都會同佢哋講解一下個片段入面，可能同佢做個撮要咁，係咪？

答：直頭係應該係好廣泛咁講嘅。

問：好廣泛咁講嘅？

答：係，係。

問：咁你播完嗰個短片之後，有冇話特別就住例如焊料需要用邊一隻，需要用無鉛，再同佢哋作講解㗎？

答：因為套片本身都有講咗話如果係用喺食水方面係無鉛嘅。咁但係因為有陣時你知啲學生有陣時會即係唔留心，諸如此類，播片，一路播，咁就可能會有陣時會疏忽咗，咁所以我哋明白嘅，咁所以我哋會重申再三一路咁強調講，甚至乎做做吓，有陣時覺得需要都會喺工場都重新講嘅。

問：所以你講嗰個一路強調講嗰樣嘢就係喺你嘅示範嗰陣時就再講嘞？

答：示範會強調講。

問：你示範嗰陣時話展示無鉛同埋有鉛畀學生睇，咁有冇特別話即係當時講解嘅時候有提及過英國標準嗰樣嘢㗎？

答：有㗎，如果我哋會--喺工場嚟講就都有講，咁但係課室嚟講就會講得會比較詳細啲。

問：明白。你有冇話聽過就係話一啲比較直徑粗啲嘅銅喉係即係要用呢個即係比較上多啲係用無鉛錫線，而呢個嗰個直徑幼啲嘅銅喉就會用多啲呢個錫條嘅，你有冇聽過呢一種咁嘅做法？

答：冇聽過。

主席：唔好用「錫條」，「有鉛嘅」，「有鉛嘅」。

許偉強先生：有鉛嘅，有鉛嘅嘅焊料。

答：即係話大口徑嘅喉就要用無鉛，...

問：冇錯。

答：...細口徑就要用有鉛咁呀？

問：係，有冇聽過呢樣嘢？

答：冇聽過。

問：冇聽過？

答：冇聽過。

問：以你所知，有鉛同埋無鉛，佢哋嗰個熔點會有啲咩嘢唔同？

答：如果無鉛嚟講，佢個熔點大概就係232度喎。咁有鉛嗰啲，咁有啲個熔點係低啲嘅。。

問：有鉛嗰個熔點係低啲嘅，係咪？

答：係嘞，就係視乎佢入面個含鉛嗰個成分係幾多。

問：因為我哋之前就聽過即係 CIC 有啲師傅就講，就話如果有鉛嗰啲，就燒出嚟係會即係杰啲嘅；而嗰個無鉛嘅話，就燒出嚟就稀啲嘅。你同唔月意呢個講法？

答：我唔同意。因為燒落去，其實你喺咁高溫嚟講，其實杰啲同埋稀啲嘅定義就其實眼燈擺埋去，你個火力猛啲，同埋冇咁猛--我唔知佢點樣杰啲，點樣稀啲。就一般嚟講，其實你嗰個焊料，佢係熔--即係嗰個情況--我唔知佢點意思喇，即係話如果譬如火力猛啲，佢會液態係緊要啲嘅，因為你火力猛吖嘛。咁但係如果火力唔夠，佢可能就會即係熔得唔夠，就可能會走嗰陣時冇咁流暢。

問：有咁暢順，係咪？

答：因為佢嘅火力係影響嗰個焊料嗰個焊接嗰陣時嗰個情況係好緊要嘅。

問：明白。我想問多你一點，就係剛才講緊熔點嘅時候，我想問一問你，如果你睇一睇呢個文件夾嘅 563 頁。

答：係，唔好意思，聽唔到。

問：563 頁。

答：係，536。係。

問：因為剛才你都同我哋解釋過，就係嗰個無鉛嗰個焊料，個熔點就應該會高啲嘅；有鉛嗰個焊料，熔點會低啲嘅。

主席：有鉛嘅焊料個熔點，睇下嗰個含鉛量幾多，先至可以決定到個熔點係幾高，所以唔可以一概而論。

許偉強先生：係。

問：即係如果我哋睇下，即係如果含鉛嘅焊料，即係我想知一知個含鉛嘅焊料嚟講，係咪如果係含鉛嘅，我哋呢度睇 563 頁，如果係含鉛低啲嘅，咁反而我哋呢度睇到嗰個熔點就係低啲嘅。

主席：係吖，係吖。即係你一定要蘋果同蘋果比，...

答：係呀。

主席：...橙同橙比，就唔好蘋果同橙比。因為我哋聽嗰啲證供，啲人就係基本上就係蘋果同橙比，有陣時。

許偉強先生：係，係，明白。

問：即係一明白嚟講，如果我哋講即係有鉛嘅物料，一般嚟講都係含鉛量越高，個熔點係越高嘅？

答：等如--頭先咁講，因為好多時你嗰個焊料入面其實有陣時未必淨係含鉛嘅，仲有其他。你要睇番個成分係點樣，先至可以決定到佢個熔點嘅。

問：明白。

主席：如果我哋講--應該咁講，如果我哋講個焊料裏面嘅主要成分係鉛同埋錫，咁就係含鉛量越高，就熔點就越高？

答：係。

問：越高？

答：係。

問：越高。

主席：鉛同埋錫。我哋唔講第二啲，因為焊料其實可以唔用錫，又可以有第二啲㗎嘛。

答：係呀，係呀，可以。

主席：係呀。

問：明白。你有冇聽過嗰個無鉛嗰隻焊料係叫做「高溫錫線」，有冇聽過呢樣嘢？

答：「高溫錫線」冇聽過。

問：冇聽過。

主席：或者「高溫錫條」都冇聽過，無鉛嗰隻？

答：我所認知，如果你係無鉛錫線，或者錫條都好，你其實如果係嗰種金屬，佢嘅熔點係咁多就咁多，我就冇聽過點樣高溫、低溫。

許偉強先生：我冇其他問題嘞，唔該。

主席：唔該。

<u>殷先生盤問</u>

問：陳生，我有幾個問題想問一問你添嘅。你個人應該對用焊料嚟接焊物料呢一個技術都有啲認知嘅，可唔可以咁講？

答：有。

問：首先佢個基本嘅原理就係用一隻叫做 filler metal 嘅嘢，係熔點係低過嗰啲 base metal 嘅，即係佢用焊料，個焊料本身嗰個熔點係低過要接駁嗰啲物料？

答：當然喇。

問：係咪？

答：係。

問：咁就將嗰兩件金屬接連起一齊？

答：係。

問：呢一個技術或者個原理，我哋知道有好多焊料都可以做到嘅。

答：係。

問：咁但係習慣上就用呢個攝氏 450 度嚟做一個分水嶺。低過 450 度熔點嗰啲焊料，習慣叫做 soft solder，係咪？

答：係。

問：高過嘅呢，就有陣時叫做 brazing，有陣時叫做 hard solder，係咪？

答：而 brazing，即係高熔點嗰隻焊料，基本有 silver brazing，但係亦都有 copper brazing 或者其他唔同嘅物料嘅？

問：係？

答：咁但係無論點都好，唔理你用邊隻焊料，如果你用同一隻焊料嚟講，一般嚟講係咪如果講話接駁銅喉咁先至算，個銅嘅直徑越大，嗰個 joint withstand pressure 嗰個能力係越低嘅？

主席：再講多次。

問：個銅喉個直徑越大，如果你用同一隻焊料，個直徑越大，嗰個 joint 嗰個抵受壓力嘅能力係越低？

答：一般嚟講，其實你同埋一隻物料，你用喺大嘅喉管同埋細嘅喉管，其實佢可以--因為佢主要都係焊接咗，其實佢受嘅壓力都係差唔多嘅。

問：因為我點解咁問呢，我外行人嚟嘅，不過我就見過一個，或者你可以睇睇一個 British Standards 嘅，而家就其實係 European Standard㗎喎，就 BS EN 1254，咁喺 B15.4 文件盒嘅 40193 都有喺處嘅，有個 Table 6。即係呢個 BS EN，據我了解，其實即係頭先講嗰個 British Standards 864，不過就更新咗。

答：未睇，係，唔好意思。係。

問：因為我哋知道 BS 864，後來英國因為加入歐盟，就變咗做呢個 BS EN 1254 嘅。

答：係。

問：咁呢度有個表，佢列出基本上有講就係唔同嘅焊料喺唔同嘅 working temperature，即係嗰個溫度下低係唔同口徑嘅銅喉抵受壓力嘅能力嘅。

我同你睇睇吖。佢第一類就係講含鉛個焊料，有啲係 50、50 或者 60、40 嘅。

答：係。

問：咁嗰度佢哋話畀我哋聽，如果 30 度水溫就 6 mm 至到 34 mm 口徑嘅喉就可以去到 16 bar pressure 嘅。

答：係。

問:咁佢又話畀我哋聽34 mm到54 mm都可以承受16個bar,但係54 mm以上到 108 mm 佢就可以抵受得 10 bar 嘅壓力啫。

答：係。

問：咁呢度 30 喇。咁佢跟住講 65 水溫個話，6 mm 口徑到 34 mm 口徑就只可以抵受 10 個 bar，34 口徑至 54 都可以抵受 10 個 bar，但係去到 54 口徑以上就跌到得 6 個 bar 啫；見到嘛？

答：見到。

問：咁再高溫啲，110 度，就仲差啲添，6 徑至到 34 同埋 34 至到 54 mm 口徑都係得 6 個 bar，而 54 口徑以上就得 4 個 bar 啫；見到嘛？

答：係，見到。

問：咁下面佢就跟住就講兩類嘅嘢，羅馬數字 II 同 III 嗰度，佢擺埋一齊嘅，有啲係"Tin/silver"，有啲係"Tin/copper"嘅焊料。

答：係。

問：即係錫同埋銀或者錫同埋銅嘅合金嘅焊料。

答：係。

問：咁我哋見到佢 30 度水溫，抵受到壓力就話 6 mm 至到 34 mm 或者 34 mm 到 54 mm 口徑都係 25 bar 嘅，去到；見到嘛？

答：見到。

問：但係到到 54 mm 口徑以上得 16 啫。咁而我哋再睇下一啲，去到 65 度水溫，6 mm 口徑至到 34 mm 就都可以抵受 25 bar，但係 34 mm 口徑以上嗰啲到 54 mm 就得 16 bar；見到嘛？

答：見到。

問：咁就再高啲，去 54 mm 到 108，都係 16 bar。跟佢再高溫啲，110 度水溫個話，就 6 mm 到 34 mm 就可以 16 bar，但係 34 mm 以上就得 10 bar；見到嘛？

答：見到。

問：咁再下面佢就講 brazing 嘞。Brazing 佢講幾種唔同嘅焊料嘅。

答：係。

問：咁有 silver brazing、silver/copper、silver with cadmium，有啲係 copper and phosphorus 咁。咁佢講嗰度基本上都係講番啲唔同嘅 working temperature 同埋嗰個承受壓力嘅能力。咁基本上你見到係同第二類，即係頭先講嗰啲無鉛嘅低溫焊料，無鉛嘅錫料係一樣嘅，冇分別嘅，你睇睇嗰個表。

答：點樣--噢，...

問：30 度，又係去 6 mm 至 34 mm 嗰啲喉就 25 bar。

答：係。

問：即係頭先我哋睇過，無鉛嘅錫料又係咁。咁 30 度水溫，去到 34 mm 口徑，至到呢個 54 mm 口徑，又係 25 bar；54 口徑以上係 16 bar；睇到嘛？

答：係，睇到。

問：65 度又係，如此類推。咁你睇睇睇嗰啲數字，基本上無鉛錫料同埋 brazing 係冇分別嘅？

答：係。咁但係一般嚟講，喺呢個表佢列出嚟，佢當然有佢嘅理據，咁但係一般嚟講，如果喺喺水喉工程嚟講，好多時我哋都係嘅，其實嗰個壓力同埋個溫度係直接影響到你個焊料，用咩嘢焊料去接駁嘅。因為譬如出面我哋如果係壓力係比較低啲，溫度比較--即係譬如唔係中央系統嗰啲，即係一般住宅嗰啲，好多時我哋都係用錫料，即係走錫嘞。咁但係如果好似中央嘅，譬如壓力承受大啲嘅，可能溫度又高啲嘅，中央系統，酒店、醫院嗰啲，好多時你用錫嚟講，因為本身嚟講，如果中央嚟講，嗰個喉管嘅直徑應該會大啲嘅，同埋喉管都多啲，接駁口多啲嘅，咁所以好多時個水喉工程嚟講都會燒銀焊或者銅焊。

問：咁但係我咁講啱唔啱呢，其實溫度，即係佢入面走嗰啲物料，即係水喇吓，如果我用水，當然可能係唔係水喇，係其他嘅物料都唔定，水溫同埋嗰個口喉徑，嗰個喉管，被接駁嘅喉管嘅口徑，都會影響佢受壓嘅能力。基本嚟講就算你用同樣嘅焊料，越高溫，就嗰啲水越高溫，同埋個喉管越粗，佢承受壓力嘅能力越低嘅？

答：高溫就肯定係嘅，因為你高溫嚟講，你見到個熔點本身係唔同喇。你錫嚟講個熔點同埋你銀焊嘅熔點都係唔同嘅，咁所以亦都溫度係影響好大。壓力亦都係嘅。咁但係如果你淨係條喉嘅直徑嚟講，就應該睇個表都係有嗰個影響。

問：因為我哋見到，如果淨睇呢個表咁，用無鉛嘅錫嚟做焊料，如果我哋而家講緊 108 mm 以下嘅喉管，因為呢個表淨係講 108 mm 以下，即係有啲粗啲嘅，我哋至到 108 mm，即係 4 吋嘅。

答：180 點...

問：108。

答：108 係 4 吋喱，係。

問：4 吋喱啫。4 吋喉啫，有粗啲嘅。

答：係，有，有，有。

問：即係 4 吋以下嘅喉似乎如果用有鉛嘅焊料嚟比較起 silver brazing...

主席：有鉛定無鉛？

殷先生：有鉛。

問：...就爭咁一大橛，即係有鉛嗰啲焊料嚟接駁，嗰個承壓力差過 silver brazing 好多，我就見--睇番個表。

答：有...

主席：唔係，我想問一問先，你哋房署個 specifications，大口徑嘅都要用銀焊喎。

殷先生：係。

主席：啱唔啱呀？

殷先生：啱。

主席：得。

殷先生：係。

主席：咁點解房署嘅 specification，大口徑唔用呢個無鉛嘅鉛焊？

殷先生：因為大口徑就無鉛個錫焊，都會個 performance 係低啲。

主席：得，唔。

殷先生：但係細口徑嘅，就基本上係--如果水--如果係水嚟講，去到熱水 110 度，都冇分別。

主席：水唔會去到 110 度嘅。

殷先生：嗄，所以水去到 100 度嘅啫。所以咁個表話 110 度都冇分別，就即係冇分別㗎嘞用水就。我想帶出呢一點啫，問一問證人。

主席：唔係，其實好簡單，其實佢講嚟講去都係講一樣嘢，即係佢就想--即係因為我哋聽到，就話出面嘅私人發展商，...

答：係。

主席：...就算係嗰個水喉，...

黎先生：細直徑。

主席：...個直徑係細，...

黎先生：都用銀焊。

主席：...都係用銀焊。

答：係。

主席：咁樣樣就我哋聽到嘅證據，就係話銀焊因為燒完之後係實淨好多。

答：係。

主席：係咪？殷大狀嘅意思就即係--因為佢哋房署基本上就列咗三種出嚟，就任啲承建商就選擇用邊一樣嘢，佢哋就冇指定話「啊，你一定要用呢個銀焊嘅。」咁...

殷先生：大口徑就有，大口徑有。

主席：大口徑就有。咁即係個意思就即係，佢就想話畀你聽，「啊，其實睇呢個表呢，喂，冇分別個喎，如果細口徑嚟講？用銀焊又好，用無鉛嘅好，點解」--即係喺房署嘅立場，因為冇分別，所以任你哋用喇咁樣樣。但係我哋知道私人嘅屋邨就全部用銀焊--唔係全部，好多用銀焊，咁就係因為佢哋話啲工人上嚟，就話「啊，因為--係，可能睇個表，真係可能冇分別，不過實際上就係銀焊就實淨咗好多嘅。」你嘅經驗又係點樣樣呢？

答：實際上，即係我都分享下我經驗，其實你走錫同埋銀焊或者銅焊，其實你發覺佢第一，個熔點係唔同；同埋我喺一般嚟講，你見到可承受壓力都係唔同。

主席：咩嘢程度？可靠性都唔同？

答：唔係，承受個壓力。

主席：承受壓力唔同嘅？

答：嗄。因為譬如你喉管，一般嚟講，住宅嚟講，可能個承受壓力，住宅唔會好高壓。

問：3 bar 嘅嘅啫，最多。

答：嗄，所以你見到好多時住宅嚟講，就算喺私人樓，都會有用走錫。但係如果你用銀焊嚟講，當然佢穩固性係比較好啲。但係相對地，你發覺用銀焊嚟講，亦都係你個操作上，同埋你成本上都係有唔同。

主席：貴啲。

答：貴啲。

主席：唔。

答：同埋你起碼你燒嗰陣時，你噴燈，係做唔到，咁你要用風煤，係咪？即係係有唔同。當然你話「哦，我個質量--我個物業嘅質量係靚啲嘅。」甚至乎你見到出面有啲龍頭都係鍍金龍頭。即係視乎睇你嗰個要求係點樣，但係一般嚟講，如果我哋係--所以身為一個水喉匠嚟講，應該你要衡量到，咩嘢情況之下係用走錫。當然你係滿足到嗰個系統嗰個要求。

問：咁...

主席：其實有冇分別呢？我當然--如果純粹係睇表吓。

答：係。

主席：呢個就係喺個喉管裏面嗰啲嘅水又好、氣又好製造出嚟嘅壓力，呢度純粹睇呢個就係。

答：係。

主席：但是你私人屋苑，就因為--因為房署就全部外露。

答：係。

主席：但是你私人屋苑，就全部內藏。

答：係。

主席：你整好晒之後，就落石屎，本身你落石屎嗰陣時，我哋聽到，第一，就會本身有重量，亦都有壓力即係，喺出面呀。

答：係。

主席：第二，就係我哋聽到話，可能你落咗石屎之後，你要震嘅，因為你要等佢冇空氣喺裏面，即係將啲 void--盡量 minimize 咗啲 void，所以就會震，咁呢度又會有壓力，係咪因為咁嘅原因？

答：其實最主要就係--佢要承受就係喉管本身你個系統個壓力。

主席：裏面出嚟嗰個壓力？

答：係，因為你譬如呢啲石屎，譬如諸如此類外面嘅嘢，你固定咗之後，佢就係穩定咗個壓力。但係你喉管入面嘅壓力，你個系統係用咩嘢呢？唔同嘅。即係等如頭先我講，住宅嚟講，你屋企唔會用到好高磅嘅。但係你酒店、或者醫院、或者係特殊用途嗰啲，咁你可能個壓力係高啲。當然，有啲水喉匠就擔心，如果壓力低，你用錫同埋用銀焊，個問題唔係太大。但係如果當你壓力大嗰陣時，如果你用錫，有機會佢係嗰個穩固性唔係咁...

主席：即係會爆水喉？

答：係。

主席：漏水？

答：係，係。

主席：唔。

殷先生：我問多一條問題，應該係即係希望幫助委員會。

問：就係你頭先都講過，就話其實作為一個水喉匠，你自己應該可以衡量到乜嘢嘅情況係要用乜嘢焊料。因為你對個焊料喺乜嘢嘅溫度，承受幾多壓力係有認知嘅，啱唔啱？

答：係。

問：同埋亦都係個喉管幾粗，係對嗰個承受壓力嘅能力影響都會知嘅，啱唔啱？

答：應該都有一般嘅認知。

問：我問番條問題，其實跟進許大律師問過你。因為出面我哋聽過，喺呢個委員會度作供，有啲水喉匠就話，佢哋就幼嗰啲喉，就用啲無鉛--用啲有鉛個焊料；粗啲嗰啲喉，就曉得用啲無鉛嘅焊料。我哋而家睇番呢個表，我哋見到啲有鉛嘅焊料，當你用啲粗啲嘅喉嘅時候，就唔係幾受得壓力㗎嘞。

主席：即係更加唔合邏輯，係咪？你嘅意思，係咪？

殷先生：唔係，合邏輯，佢識得分。佢識得分粗啲喉嘅時候，就因為抵受唔到壓力，就要用啲無鉛錫線。

主席：哦，明白，唔。

問：會唔會係咁？其實個水喉匠自己知道有鉛嗰啲焊料，就唔頂得壓力嘅，如果啲喉一粗，所以佢識得去話，幼嘅喉，可以用啲有鉛嘅焊料。

但係粗啲喉嘅時候，就要用無鉛，因為佢頂受--如果用有鉛嗰隻，就抵受唔到個壓力，會唔會係咁？

答：我相信就唔係呢個。因為好多時喺出面，如果行頭嚟講，好多時啲師傅就選擇走錫，一定係--銀焊就要視乎--即係喺一般嚟講，我嘅認知，就應該佢就唔會話咁仔細就話含鉛、唔含鉛嗰個即係可受壓力。但係應該嚟講，佢哋應該係知道，就係走錫同埋銀焊、銅焊承受嘅壓力係可以唔同。

殷先生：冇問題。

主席：仲有冇人有問題？好，冇問題。

好，唔該晒你，陳先生，...

答：好，唔該晒。

主席：...好多謝你今次出席。

許偉強先生：唔好意思，主席。唔好意思，主席。

主席：哦，仲...

許偉強先生：我想跟進番一點，可能我自己唔係好理解，不過我想再問多佢一次。

<u>許偉強先生進一步盤問</u>

問：就係如果我哋睇番嗰個 W1 嘅 563 頁，就住我剛才有問過你關於嗰個熔點嗰樣嘢，我想再理多少少。

答：係。

問：就係我哋呢度睇，就有三種唔同嘅焊料，就分 A、B、C。剛才我問嘅

時候，因為我同你討論過，就係話--因為呢度就咁睇，A，含鉛就 34；B，含鉛就 48；C，含鉛就 68。如果我哋就咁睇呢三種物料嚟睇，就含鉛越高，咁個熔點就越高，係咪？

答：係，係。

問：而就咁睇，如果我哋睇個錫嗰個含量，就係嗰個錫越低，含鉛量就越低--唔好意思，錫越低，嗰個熔點就越高？

答：因為你見到鉛，其實個熔點係比錫係高嘅。

問：係。

答：所以佢混合咗落去，同埋合金好多時，你睇到佢仲有銻。

問：係。

答：可能仲有其他嘅物質喺入面。

問：明白。

答：所以如果睇呢度嚟講，你話--即係如果呢三個嚟比，錫係 30%同埋 65%，個溫度如果喺呢個嘅情況之下，30%嘅錫喺呢個物料嚟講，就係溫度高啲。

問：明白。

答：如果喺 65，就係低啲。

問：我明白。但係因為我哋想你睇一睇，就係如果我哋講番呢隻無鉛焊料。

答：係。

問：我哋如果睇一睇 B15.1，37823 頁。

答：唔好意思，未得。

問：唔好意思，慢慢。呢個就係就住嗰個無鉛焊料嗰個組成，就係一個 test report 嚟嘅。

答：係。

問：咁呢隻無鉛焊料，我哋睇到，如果我哋講錫嘅成分，就係 99.15。

答：係。

問：個銅嘅成分，就係 0.85，咁就係無鉛嘅呢一隻。

答：係。

問：我想理解一下，就係話--因為我哋知道呢一隻嗰個熔點就係超過嗰三隻，即係 563 頁嗰三隻，係大概有二百二十幾度以上嘅，個熔點係。

主席：二百三十幾。

問：係，大概 230 嘅。

答：係。

問：我想問下，就係話就住熔點嚟講，呢樣嘢同嗰個鉛嘅成分有幾多，係咪有一個直接嘅關係啫？

主席：同個鉛嘅成分有幾多。

答：因為喺呢度嚟睇，你見到佢含錫嗰個成分就去到 99.15，好高嘅。

問：係，係。

答：同埋銅嚟講，亦都佢係滲入咗入面係其中一種物質。

問：係。

答：可能仲有其他嘢，不過佢就無鉛咁解啫。所以喺咁嘅情形之下，其實每種嘢合埋之後，頭先--我就睇唔到佢嗰個熔點喺呢度話二百三十幾。

問：係。

答：一般嚟講，我哋錫嚟講，純錫嚟講，都係 232 度喎。

問：明白。因...

答：所以個銅，我亦都係，其實你其他嘅物質落去，係會影響佢個溫度，但係視乎你係落咗幾多落去。

問：明白。因為我最後想問你就係，如果我哋純粹睇啱啱嗰個563頁。

答：係。

主席：錫嘅熔點係幾多話？對唔住，你頭先講係幾多？

問：錫。

答：錫嘅熔點係232度，大概。

主席：鉛嘅熔點呢？

答：吓？

主席：鉛嘅熔點呢？

答：鉛嘅應該就係420度咁上下。

主席：唔該。

問：如果我哋睇番啱啱W1嗰個563頁，...

主席：唔同㗎，MR KHAW。

許偉強先生：係，係。

主席：如果加咗一個銅落去，就可能已經完全唔同晒㗎嘞。

答：係，你銅個溫度更加高。

主席：係，你唔可以蘋果同...

答：係。

問：明白。即係加咗銅之後，可能就...

答：唔係，好難，因為你如果咁樣，好...

主席：你唔可以咁樣比嘅，係呀。

答：即係你話你加咗落去，你根本就唔同物料喇，個溫度根本會變，同埋你個成分多定少，同埋有冇其他雜質，...

主席：都話蘋果同橙囉，係囉。

答：...係好直接影響到佢個溫度同埋個成分。

問：明白，明白。好，唔該。

答：Okay。

主席：好，唔該晒你，陳先生。

答：好，唔該晒。

主席：Thank you。

我哋而家午膳，晏晝再繼續，唔該。

上午 12 時 59 分聆訊押後

下午 2 時 31 分恢復聆訊

出席人士如前。

聶先生：主席，我傳召梁文先生。

主席：好呀。

職業訓練局第三證人：梁文（職業訓練局高級導師）以本地話宣誓作供
聶先生主問

問：梁先生，請你翻開你嘅證人供詞，你會睇到第 6 頁嗰度有個簽名，嗰個係你本人嘅簽名？

答：啱。

問：第 7 頁嗰度都係？

答：啱。

問：我首先就將你證人供詞讀出。

答：好。

食水令鉛超標調查委員會

梁文證人陳述書(LEUNG MAN)

1. 本人，**梁文(LEUNG MAN)**，就食水含鉛超標調查委員會("**委員會**")於2015年11月18日致香港專業教育學院("IVE")建造工程系的信函（"**該信函**"）內的請求，提供比證人陳述書。此份陳述書將回應該信函內第6至11點的請求。

2. 職業訓練局("VTC")授權本人就委員會的請求當中的第6至11點作出相關的回應。

背景

3. IVE是VTC的機構成員。

4. 本人於1973年入讀VTC前身的摩理臣山工業學院，並於1977年通過水務署考試成為二級持牌水喉匠。於1992年通過「香港水務設施課程證書」考試「課程編號：5267」成為一級持牌水侯匠。

5. 本人於1987年加入VTC，當時的職位是二級工場導師。本人於2009升任為高級導師。本人的職責，主要是提供IVE建造工程系的水喉工場實習訓練，包括有關水喉接駁的實習訓練。

6. 本人是IVE所提供的兩個水喉工程課程，即「水喉全科技工證書」課程(Craft Certificate in Plumbing and Pipefitting)(課程編號:53776/55776)及「香港水務設施課程證書」(Certificate in Plumbing services (Hong Kong))（課程編號：56767）的導師，負責課程中工場實習訓練和技能考核，包括水喉接駁相關的部份。故此，本人對於水喉匠的訓練和考核有相當的了解及認識。如若本人在此份陳述書有資料並非屬於本人直接認知的範疇，本人會標明有關資料的來源及出處。

7. 本人知道盧永康先生（即IVE摩理巨山分校建造工程系的系主任）及陳子健（即VTC薄扶林分校的導師）均有就委員會的請求以證人陳述書的形式作出回應，本人亦已經閱讀了該兩份於2015年12月23日所簽署的證人陳述害。本人相信當中的內容是正確的。

問題6

8. 問題6的內容如下：-

根據現有證據顯示，銅喉的使用由2002年左右開始普及，尤其是用於公共屋邨。因應銅喉被廣泛使用，利用錫焊(Soldering)的方法接駁銅喉管亦成為一個普遍的做法。請描述VTC所提供的水喉課程有否因應銅喉及銅製配件被普遍使用在建造及安裝食水水喉系統而作出相應的改動，並描述所作出的改動。

9. 根據本人所知，「水喉全科技工證書」課程是一個為期三年的兼讀課程。根據VTC的網頁介紹，這課程的入學資格是中三畢業或同等學歷，無需具備與水喉工程的相關工作經驗（如在職水喉行業者會作優先取錄）。課程的內容是向學生提供有關水喉全料之工藝理論及實習訓練，內容包括水喉實習、水喉繪圖、食水及沖廁供水、消防及氣體裝置、房屋建築、熱水供水、水喉工料量度、資訊科技初階、水喉科學、水喉數學、排水系統、建造繪圖及喉管安裝等。由1987年本人加入VTC開始，本人已經在這課程中負責教授工場實習所需技術。這包括接駁食水喉管的方法。

10. 至於「香港水務設施課程證書」該課程是一個為期39小時的短期兼讀證書課程，為合資格的在職水喉匠重溫所需知識及技能測試，以符合持牌水喉匠的申請資格。在這課程中，本人並不會教授水務設施相關的知識，亦不會教授水喉接駁的技能，只是直接進行技能測試。而在1999至2004年期間（即2002年前後）的技能考試均有包括錫焊喉管接駁的測試。正確來說自2001年起至今，技能考試均已包括錫焊喉管接駁的測試。

11. 自本人於1987年加入VTC開始，本人在教授「水喉全科技工證書」課程中，學員均會學習如何使用錫焊(soldering)的方法接駁各種不同種類喉管的接駁技能，當中包括使用鋼喉及銅製配件。有關水喉課程的轉變及改動，詳情請見盧永康證人陳述書的第43至52段。

<u>問題7</u>

12. 問題7的內容如下：-

確認學生有否學習在建造和安裝食水水喉系統時所需用的不同組件（以及其中的成份）及物料。

13. 本人確認本人是根據盧永康證人陳述書當中所提及的課程大綱(Course Schemes)的內容進行教學。在「水喉全科技工證書」課程中，學員在理論課堂上會學習建造和安裝食水水喉系統時所需用的

不同物料。這些物料包括金屬、合金及塑膠等。學員亦會在理論課堂上學習建造和安裝食水水喉系統時所需用的不同組件及它們的原材料。這些組件包括不同的喉管（如鋼管、銅管、塑料管等）及其他配件。

14. 本人在實習訓練當中，會引用學員在理論課堂上已經學習的錫焊知識，包括錫焊所需的組件及物料等等，再附上實物說明，這可以使學員就課程有更深入的理解。

問題 8

15. 問題 8 的內容如下：-

確認在有關時間（即由 1969 年起至今）（"**有關時間**"）內，由職業訓練局所開辦的課程，有否教授接駁食水水喉喉管所使用的錫料和焊接物料，而學生有否在課程中學習在市場上不同種類和品牌的焊接物料，包括那些物料是無鉛，而那些物料是含鉛，以及錫線(solder wire)和錫條(solder strip)的分別（包括物料上和功能上的分別）。

16. 自本人於 1987 年加入 VTC 開始，本人在教授「水喉全科技工證書」課程中，會教授學員使用錫焊(soldering)的方式接駁食水喉管。錫焊所需用的物料包括接駁的銅喉管、助焊劑(flux)、接駁用的配件及錫線。本人在教授過程中只會利用錫線作為教材，而不會選用錫條，因為在焊接過程中需要燒溶錫料，錫線相比起錫條較容易控制及掌握。不過，錫線和錫條在功能上是一樣的，即是提供接駁時守所需用的錫料放進所需接合的位置。

17. 本人在教授錫焊過程前會先介紹一款含鉛錫線及一款不含鉛錫線，並說明兩者的用途（如：含鉛錫綠多用於電線或線路板中，而用於食水銅喉接駁必須使用<u>不含鉛</u>錫線），但不會提到所用錫線的牌子，以避免被指協助宣傳某一品牌的產品。

18. 本人在教授過程中會提醒學員，錫焊的所有物料必定<u>不可</u>含鉛。

19. 由於本人在教授過程不會使用錫條，所以本人不會提到有關錫條的使用事宜。

問題 9

20. 問題 9 的內容如下：

確認你或職業訓練局是否知悉有一種焊接物料（是錫條形狀）的品牌名為"50 力扁錫條"，並提供有關物料的樣本及交代有關物料的成份（特別是其鉛含量）。

21. 本人未有聽聞過一種焊接物料的品牌名為"50 力扁錫條"，在教學過程中亦從未有採用。故此，本人未能提供此物料的樣版及/或交代其成份。

問題 10

22. 問題 10 的內容如下：

確認在有關時間內，學生在課程當中有否學習水喉物料，包括錫料，是需要無鈴，以及使用含鉛的水喉物料的風險。

23. 如以上第 18 段所述，本人在教授過程中會提醒學員，錫焊的所有物料必須不可含鉛，這包括錫焊用的水喉物料及配件、錫料、接著劑及錫線均不可以含鉛，因為鉛是對人體有害的。

問題 11

24. 問題 11 的內容如下：

確認在有關時間內，學生在課程當中有否學習接駁銅喉的焊接技巧，如有，請交代如何用正確以焊接方式接駁喉管。請以證人陳述書的附件形式，提供一段錄像的副本，以介紹以焊接方式接駁喉管的方法。

25. 如以上第 16 段所述，本人在「水喉全科技工證書」課程中會教授用錫焊(soldering)的方式接駁食水銅製喉管，即銅喉焊接，方法以下：-

(A) 含錫配件（即配件內有一個節環，裏面含有錫料）

(1) 首先將需要焊接的喉管套進配件，然後拿出，從而得知焊接須用

的面積，並用砂紙清潔喉管表面及配件，因為水喉表面和配件有可能會被氧化，因而影響接駁。

(2) 繼而在喉管表面（焊接須用的面積）和配件內壁塗上助焊劑，以清理侯管表面和配件內壁，及防止喉管表面及配件氧化。

(3) 將喉管套入配件，然後用石油氣火槍將配件有錫料的部份暖熱加溫。

(4) 然後將火力移至接合處。

(5) 當接合處見到有銀色的錫料（即錫料已被溶化）滲出，即是已經成功接合，火槍便需要移開。

(6) 如果錫料並未能均勻分佈在接合處，可以用火槍再加多點熱力，令錫料熔化。

(7) 由於喉管表面是有助焊劑，所以需要用毛巾清潔。整個喉管接駁方告完成。

(B) 走錫配件（即配件沒有節環及錫料）

(1) 首先將需要焊接的喉管套進配件，然後拿出，從而得知焊接須用的面積，並用砂紙清潔喉管表面及配件，因為水喉表面和配件有可能會被氧化，因而影響接駁。

(2) 繼而在喉管表面（焊接須用的面積）和配件內壁塗上助焊劑，以清理喉管表面和配件內壁，及防止喉管表面及配件氧化。

(3) 將喉管套入配件。

(4) 因為配件當中並沒有錫料，所以需要外加錫料到接合處，而這需要用到無鉛的錫線。

(5) 然後用石油氣火槍將喉管和配件暖熱加溫，繼而將錫線放在喉管上。只要喉管的溫度足夠，錫線就會熔化成為錫料。

(6) 當錫料熔化後，可以再加熱接合處，直至整個接合處均有錫料（銀色物料），就是成功接合，可以移開火槍。

(7) 如果錫料並未足夠，可以再加放錫料到接合處加熱。

（8）最後是使用毛巾清走喉面的助焊劑。整個喉管接駁方告完成。

26. 應委員會的要求，本人亦已拍攝了三段教學影片，列為<u>附件一</u>，以供委員會作參考之用。

問：梁先生，我讀完你份證人供詞，裏面所講嘅嘢係真確？

答：真。

問：你願唔願意採納證人供詞裏面講嘅嘢作為你呢個嘅證供？

答：採納，採納。

聶先生：主席，我冇其他問題。

主席：唔該。Mr Khaw。

<u>許偉強先生盤問</u>

問：梁生，你好。

答：你好。

問：首先有少少背景資料就想同你確實一下嘅。

答：好。

問：我見到你個證人陳述書嗰度都講及你嗰個履歷，我都想問一問番你嘅，就係喺你第 4 段嗰度就講話 73 年就入讀 VTC 前身，即係摩理臣山工業學院。

答：係。

問：係咪嗰陣時，我想問一問就係你就係 1977 年就通過水務署嗰個考試就成為二級嗰個水喉匠嘅？

答：啱。

問：我呢度就咁睇，以嗰個時間嚟睇，你 73 年入讀 VTC 嘅時候，係咪都係當時讀嗰個水喉技工嗰個證書？

答：潔具及水喉喉管裝配。

問：喉管裝配？

答：係。

問：都係一個--嗰陣時係咪都係三年嘅課程嚟㗎？

答：三年。

問：三年課程嚟嘅。讀完呢個課程之後，你就去考水務署嗰個試，係咪呀？

答：係，冇錯。

問：我想問一問，就係當時考水務署嘅試之前，即係你讀完嗰個課程，又考水務署嘅試，考試之前，水務署有冇一套例如啲簡介畀你話考試要考啲咩嘢課題咁樣嘅嘢？

答：冇。

問：冇嘅，係咪呀？

答：實冇嘅。

問：亦都冇話特別有啲咩嘢水務署所出嘅講義或者水務署出嘅一啲資料，就有關考試考乜嘅？

答：冇嘅，冇。

問：冇嘅。你當時例如你哋要去應付呢個考試之前，你哋點知係要點樣準備？

答：我哋係靠--即係我哋有啲師兄弟，佢本身都係曾經考過，...

問：明白。

答：...喺呢啲情況，我哋會係大家係商討下喺裏面有啲乜嘢係需要係會去問到。

問：即係要問下啲師兄咁樣？

答：係喇。

問：好，我想問一問你就係因為我哋今日之前問陳先生嘅時候，因為佢都考過嗰個水務署嘅試嘅。

答：水喉匠。

問：佢都同我哋有講過就係話有筆試，亦都有面試嘅，係咪呀？

答：唔。

問：你當時係咪都係咁嘅情況？

答：係。

問：我想問下你就住筆試嚟講，有冇話特別話考你哋對於呢啲水務規則嘅認識？

答：冇，冇。

問：冇嘅？

答：係要畫一個叫做係 line diagram，即係供水系統。

問：供水系統，即係畫圖嘅，係咪呀？

答：畫圖嘅。

問：有冇話特別考你哋有關例如做供水系統嗰啲咁樣嘅部件、物料要符合啲咩嘢規格、要求，嗰方面有冇考？

答：呢個係面試嗰陣時會問到。

問：面試嗰陣時問到嘅，係咪呀？

答：係。

問：就呢一方面嘅知識，即係你面試嗰陣時佢問到你有關水喉部件、物料嘅知識，你係點樣學番嚟㗎？

答：係喺堂上，同埋喺一啲--因為我哋本身係喺一個叫做係學徒訓練嘅，我嗰陣時就喺公司嗰度就有一啲先生係 training 我哋嘅，咁喺裏面學到返嚟。

問：等等先，你講嗰啲先生 train 你哋...

答：即係喺公司裏面有啲係訓練先生。

主席：等一陣先。即係你當時就入咗一間公司就做學徒？

答：係，冇錯。

主席：公司就送你去摩理臣山就讀呢啲書？

答：摩理臣山讀夜校，係喇。

主席：得。

問：即係讀呢個課程之前，你做學徒嘅時候就已經有啲人同你講解下呢方面嘅知識嘅？

答：係喇。

問：喺個課程嗰度亦都有...

答：有。

問：...討論過相關一啲即係有關部件、物料需要符合啲咩嘢規格嗰啲？

答：有嘅。

問：嗰啲有嘅？

答：堂上先生係有講嘅。

問：因為都好耐之前，可能細節未必一定話記得好清楚喇。

答：係呀，唔。

問：但係想問下你，例如講緊我哋呢一排都係講緊呢個做食水銅喉嘅配件，例如焊料嘅嗰啲，需要符合啲咩嘢標準呀咩嘢，呢方面有冇特別話即係你有認識㗎當時？

答：有。

問：都有嘅。講下你嘅認識係乜嘢？

答：譬如我哋通常就喺我哋年代裏面，我哋基本就係用係行頭叫做攢栿，即係壓接式接駁方法，同埋就會係利用得啲係走錫曲去接駁，基本嗰啲係外置錫料落去嘅話，係好少嘅，當時。

問：明白，即係當時就係攢栿同埋內置錫料就普遍嘅，係咪呀？

答：係喇，內置錫料焊接，係喇。

問：即係所以當時如果你講緊你考呢個水務署嗰個二級持牌水喉匠嘅時候，就對於呢個外置，即係話走錫呢一種咁嘅工序就唔係話太了解嘅？

答：唔係，係了解嘅。

問：都了解嘅？

答：因為我哋公司係 training 我哋係要做呢樣嘢嘅。

問：但係就對於嗰個話特別佢哋用嗰啲物料呀乜嘢，有冇認識㗎？即係走錫嗰方面。

答：有，因為喺理論上面係有學到嘅。

主席：請問你嗰陣時服務嘅公司係咩嘢公司？

答：煤氣公司。

主席：煤氣公司。

問：煤氣公司，好，唔該。你第一次聽到人哋講話走錫係要用無鉛嘅焊料咁嘅，係幾時？

答：應該係--我唔 sure 得，基本應該就喺課堂上面係有老師講過畀我聽。

問：課堂。

答：除此之外，喺公司裏面亦有啲先生係話畀我哋聽係需要用呢隻無鉛嘅錫線嘅。

問：公司就喺課堂之前，即係公司講嗰啲就...

答：唔係，唔係，喺 training 裏面。

主席：唔係，同一時間。

答：呢個時間裏面。

問：哦，同一時間，係。我想問下你，當時考嗰個水務署嗰個考試，成為二級持牌水喉匠，因為當時就有分一級同埋二級嘅。

答：冇錯。

問：我想問下你，係考試嗰陣時你去選擇話一級或者二級吖，定係話佢根據你考試嗰個成績個分數嚟到即係...

答：唔係跟...

問：...編排你係一級定二級？

答：唔係跟分數嘅，係根據你自己選擇係一級或二級。

問：自己選擇嘅？

答：係，冇錯。

問：好。你 77 年就通過咗嗰個二級持牌水喉匠嗰個考試，我知道你 92 年就亦都係通過咗嗰個 5267 嗰個課程，正式成為持牌水喉匠？

答：係，水喉匠。

問：我想知道就係 77 年到 92 年呢段期間，你做過啲咩嘢工作㗎？

答：我係喺番煤氣公司裏面做一啲 adviser，即係話嗰啲喉管嘅接駁。

問：喉管接駁？

答：係。因為當時嘅社會，多數都係用厚瓦，即係係製瓦嘅過程裏面接駁多嘅，除咗係一啲係爐具方面係有啲銅喉係接駁。譬如冷水嗰類嘢。

問：一路都係喺煤氣公司嘅？

答：係，嗰段時間。

主席：即係煤氣公司熱水爐，冷熱水嗰啲...

答：冷熱水喉。

主席：...接駁就用銅喉？

答：銅喉嘅，係呀。

主席：煤氣管就...

答：用鐵喉，GI。

主席：用鐵喉，得。

問：好，就一路喺煤氣公司就做，做到你92年去讀嗰個526...

答：唔係，唔係，唔係做到92年。

問：跟...

黎先生：87。

答：唔係做到92年，87年。

問：跟住...

答：87年我入VTC。

問：哦，係，87年入VTC，冇錯。跟住就87年入咗呢個VTC，我想問一問，就係你中間有冇曾經正式擔任過呢個--即係做任何呢個建築項目持牌水喉匠嘅工作？

答：未。

問：未有試過？

答：未試過。

問：好，我想問一問你，就係你87年加入咗VTC，我見到你個介紹嗰度就講你都負責兩個課程嘅？

答：係。

問：一個就係嗰個craft certificate，即係嗰個技工證書，另外你都有負責嗰個5267嗰個課程嘅？

答：係。

問：即係後嚟改咗個編號叫做 56767 嗰個課程，個分別就在於就係喺嗰個技工課程你就係有負責教授嘅？

答：教授。

問：喺嗰個56767嗰個短期課程，你最主要就係負責睇嗰個技能測試嘅，係咪呀？

答：係，冇錯。

問：我先同你講一講，就係有關嗰個技工課程入面你教嗰個範圍，如果你睇一睇就係你個證人口供嘅第11段，呢度你就話你87年加入VTC開始，就「本人在教授『水喉全科技工證書』課程中，學員均會學習如何使用錫焊(soldering)的方法接駁各種不同種類喉管的接駁技能，當中包括使用鋼喉及銅製配件。」有關水喉課程嘅轉變同埋改動，你就話睇番盧先生個證人口供。

呢度我想問一問你嘅，就係如果我哋睇番較早時候有關呢一個技工證書課程嘅講義，入面都有特別提到就有關一啲焊接嘅問題嘅，或者我畀你睇一睇一個1996年-- 64頁，呢個就係1996年嗰個課程嗰個綱要嚟嘅。我想問一問，首先就係你當時教授呢個課程，就你呢度就講話有關焊料嘅或者係水喉接駁嗰個方法，係有教到嘅。我見到

呢個課程嗰啲講義、綱要就用英文嘅，我想問下你當時教授嘅時候，有冇自己另外一套嘅一啲嘅教材㗎？

答：通常我都會係口述。

問：口述？

答：睇咗之後，用口述話畀學生聽我自己理解嘅。

問：你自己當時例如去理解呢個課程嘅內容嘅時候，你係咪睇番呢份英文嘅課程？

答：係，啱，啱。

問：好，如果我哋睇番呢個課程嘅內容，我哋見到第67頁，如果你睇67頁B嗰度有個"SOLDERING","Understands the procedures of soldering"，即係講解呢啲焊接嘅程序等等。如果我哋再睇一下82頁，1.9嗰度見到"Compares the advantages and disadvantages of different pipe materials stated in 1.8."咁樣。我想問一問就係當時，即係你教授嘅時候，如果我哋講緊例如接駁喉管，我哋都知道有幾種方法，我尋日就睇到個短片入面即係你所做嘅示範，都有包括係內置嘅...

答：錫料。

問：...錫料同埋有走錫嗰個情況，我想都問下你，就住唔同方式嘅接駁方法，當時有冇話特別就住呢樣嘢講解好處、唔好處咁樣？

答：有嘅，有嘅。

問：當時係就住邊幾種方式去--即係你講嘅攢杭，係咪呀？

答：係。

問：另外仲有呢？

答：另外就譬如我哋用嘅係受熱水，或者佢嘅環境，即係譬如用喺氣體裏面，我哋要點樣去係用呢啲物料。

問：亦都有講到就係即係如果係錫焊嘅形式，都有講嘅，係咪呀？

答：有，一定有，係。

問：你哋當時，即係師傅嗰個界別，你哋講例如攢杭或者係我哋講緊而家走錫呢種，你哋當時嘅認知或者你介紹畀學生嘅嗰啲好處、唔好處都會講？

答：都會，都會。

問：就你嘅認知，例如呢兩種方法，你自己個人認為嘅好處、唔好處喺邊度呢？

答：就攢杭方面嘅話，因為佢本身係靠個杭心嚟承受壓力或者係供水，嗰個走錫方面就係亦係同一樣，但係如果係以一個係譬如藏喺牆身，因為當時嘅物料多數都係攢杭，用喺外牆多嘅，如果你用錫料嘅話，因為藏牆嘅位置都會係慳啲或者少啲，其次就話本身我哋如果係走錫係好嘅話，好嘅話，基本就同我哋攢杭嘅形式都係一樣，冇乜分別嘅。

問：即係如果你講話受壓或者係有冇咁容易漏水嘅話，以你自己個人嚟講，攢杭同埋呢一個...

答：走錫。

問：...走錫，有冇邊一種話你自己認為係邊一種好啲？

答：冇分別嘅，兩者一樣。

問：好。我哋睇下你證人口供嘅第16段，即係859頁，呢度你都講話係1987年就開始你喺教授呢一個技工證書個課程，就會教授啲學員使用錫焊嘅方法接駁食水喉管，錫焊所需用嘅物料就包括接駁個銅喉、助焊劑，即係我哋所講嗰啲松香膏。

答：松香膏。

問：就係接駁用嘅配件同埋錫線，「本人在教授過程中只會利用錫線作為教材」，就唔會選用錫條嘅，因為在焊接嘅過程中係需要燒熔錫料，錫線相對嚟講，就係較容易控制同埋掌握嘅。我首先想問一問你，就係你教授呢個課程，即係呢一個水喉全科技工嗰個證書嘅課程，你教授到呢一個錫焊，就首先你會做講解，係咪呀？

答：唔。

問：亦都會展示嗰啲物料喇？

答：唔。

問：然後你都會示範即係大概係點樣做嘅，我想問下，即係例如你講解同埋示範通常都係同一日進行嘅，係咪呀？

答：啱。

問：一般嚟講，喺你三年課程入面係邊一年去做呢樣嘢㗎？

答：我基本就係喺第二年嗰陣時，我哋會接觸到啲學生，第一年嘅話，可能係有另外一啲先生去接觸嘅。

問：即係你主要都係第二年嘅學生？

答：係，冇錯。

問：另外我想問一問你，就係就住呢個三年嘅課程，你除咗講解有關例如--你剛才講過，例如水喉有邊幾種、用啲物料係點，同埋呢一個錫焊嘅呢一個示範同埋講解，就住嗰三年課程，你其他嘅課題，你有冇都教導，即係有教授？

答：有，有，有，有。

問：其他包括啲咩嘢課題？

答：課題，即係嗰啲班級嗰啲？

問：係喇。

答：譬如好似我哋嘅以前嗰啲係 high dip.，嗰啲學生都會係用得到。

問：唔好意思，我係講緊話就住呢一個課程，即係呢個三年嘅課程，你個口供入面就講話就就住例如錫焊嗰個過程，你會講解同埋示範？

答：係。

問：另外你都會講下例如唔同水喉嘅接駁技能、唔同嘅喉管物料嘅？

答：係，啱。

問：除咗呢啲咁嘅議題，即係呢啲咁嘅題目之外，仲有冇啲乜嘢你會同學生做講解，喺成個課程入面？

答：就會譬如有啲喉管可以由一個係 GI --即係鍍鋅鋼管轉為做銅管，或

者係我哋走錫嘅有其他嘅方面可以用得到嘅，因為銅喉方面，未必係用喺一種環境或者供水嘅，可能會係用喺一啲氣體嗰類嘢，或者係啲冷氣，或者可以打啡鈴，打啤把嗰啲嘢都得。

問：明白，明白。如果係你個人負責，即係你自己負責去教授嘅有關呢個錫焊嗰個方法，你就有講解、有示範，你自己會唔會例如播啲咩嘢影片畀啲同學睇？

答：基本我就唔會播影片㗎喇。

問：你就唔會嘅？

答：我係示範嘅啫。

問：你係自己親自示範？

答：係實戰嘅。

問：好，呢度你就話你做教材，你就攞嗰個錫線出嚟嘅咁樣，係咪呀？

答：唔。

問：我想知道係咪都係一卷卷嘅錫線，係咪呀？

答：係，冇錯。

問：如果我哋而家睇到嘅都係呢啲，係咪都係類似呢一種形狀，綠色一卷卷㗎？

答：呢隻。

問：係呢隻？

答：但係之前就唔係呢隻嚟嘅。

問：之前就唔係呢...

答：但係都係叫無鉛錫線。

問：哦，明白，即係都係呢個形狀嘅？

答：係，冇錯。

問：但係就可能呢啲咁嘅包裝上面...

答：Label，係喇。

問：...就唔係綠...

答：個 brand，未必係呢個 brand。

問：就唔係呢啲咁樣嘅...

答：係喇。

問：唔係呢個牌子添，可能係，係咪呀？

答：係，冇錯，係喇。

問：你就話喺教授嘅期間就除咗攞呢一個錫線之外，都會攞啲錫條同啲學生講解有兩種唔同嘅焊料嘅咁樣，我想問一問，就係你個人嚟講，如果我哋講走錫所用嘅焊料，你一般會稱呼佢為做乜嘢？

答：錫料。

問：錫料，如果你係講緊呢啲一卷卷嘅，你會係稱呼佢為...

答：無鉛錫線。

問：錫線。

答：錫線。

問：無鉛錫線，係咪呀？

答：係喇，即係你而家手揸嗰隻。

問：如果呢個，呢啲呢？

答：呢個我未--我當時未見過呢隻。

問：未見過？

答：我見嗰啲係一條 bar 咁樣嘅，好粗身嘅。

問：明白。呢度你話喺嗰個課程呢個--教授呢個課程前，會先介紹一款含

鉛嘅錫線，另外有一款不含鉛嘅錫線？

答：係。

問：含鉛錫線，我哋知道係一卷卷呢啲，不過就可能唔同牌子，唔同顏色咁，當時？

答：係，係。

問：如果含鉛嘅，當時係點嘅形狀㗎？

答：佢都係一綑綑嘅。

問：都係一綑綑？

答：都係一綑綑嘅，佢裏面係個錫料係含有鉛質嘅。

問：係咩嘢話？

答：含有鉛質嘅。

問：含有鉛質嘅。我想問下佢啲成分，嗰個含鉛同埋不含鉛嘅，係咪都會寫喺個 label 度㗎，係咪呀？

答：冇錯，係喇。

問：係咪同一隻牌子㗎，當時，你記唔記得？

答：唔同一個牌子。

問：唔同牌子嘅？

答：係喇。

問：就住例如呢一啲咁樣一條條嘅，你自己有冇見過，當時教授？

答：我冇用過。

問：冇嘅？

答：冇見過。

問：即係你一路以嚟，有鉛、無鉛都係講緊啲錫線都係一卷卷嘅？

答：係。

問：係咪呀？

答：但係我亦見過一啲係粗身嘅，嗰啲係錫 bar。

問：粗...

答：即係好粗，好粗身嘅。

問：粗身嘅？

答：我要熔解咗，所以我供詞裏面話「因為在焊接過程中需要燒溶錫料」，喺 16 嗰度，錫線，相比起錫線較為容易控制，因為佢較為粗身，所以用嘅溫度可能高，所以我需要係拉啲--鍍一啲係幼身嘅錫線出嚟畀佢哋用，所以後期我就唔用呢啲，就用呢一綑綑嗰啲係無鉛錫線。

問：明白。即係話如果你喺呢一度，你 16 段入面講話錫線相比起錫條較容易控制，你講嘅錫條就係講緊你所講粗身嗰啲錫 bar，係咪呀？

答：粗身嗰隻，係，係，冇錯，係。

問：大概有幾粗嘅呀嗰啲？

答：差唔多一隻手指，一隻手指屘咁粗。

問：手指屘咁粗嘅？

答：係。

問：嗰啲一般係攞嚟做咩嘢用途㗎？

答：嗰啲通常我哋就以往--譬如有啲係做白鐵嘅方面，我哋都會係用得到嘅。

主席：白鐵英文即係乜嘢？

答：即係 sheet metal，唔係，即係嗰啲鋅鐵皮，鋅鐵皮。

問：明白。所以就以你個人嚟講，就唔會用嗰啲錫 bar 攞嚟做銅喉嗰啲...

答：唔會，唔會。

問：...焊接嘅工程，係咪呀？

答：唔會，唔會。

問：講番呢啲咁嘅錫線，即係逢親係咪你同同學講解話用嚟做錫焊嘅，就要用無鉛錫線？

答：啱。

問：即係你永遠都係有「無鉛」兩個字？

答：係。

問：即係...

答：Lead-free。

問：攞埋一齊嘅，係咪呀？

答：唔。

問：好喇，我想問一問，就係因為我哋就尋日睇到你嗰個介紹，即係你嗰個短片，都好清楚介紹咗嗰個工序，我想問一問就係你本人嚟講，如果你做呢啲咁嘅燒焊嘅工程，如果你用緊呢啲一卷卷無鉛嘅錫線嘅時候，係咪你都係揸住一卷咁嚟燒，係咪呀？

答：會。

問：你會唔會例如將呢一卷切到一橛橛短啲嘅嚟到做？

答：會有機會。

問：喺咩嘢情況你會決定係揸住一卷卷嚟做吖，定係切成一條條嚟做？

答：譬如我哋用個 joint 口燒嘅範圍比較大嘅話，我就唔會切成一段段，因為到到係一段咁短，後期嗰陣時可能會剩咗一部分喺度，但係可能會係焗手，變咗有機會你又要剪過另外一段去用，變咗喺物料裏面係較為啱啲嘅，所以我就用一卷，變咗用幾多就用幾多，但係如果喺教

學方面，我就會係剪成一段一段畀學生用，因為一餅裏面，學生係用唔晒嘅。

問：即係佢哋如果例如話喺度做緊實習嘅過程，即係練習嘅過程，你就會剪開一段段畀佢哋用咁樣？

答：一段一段，係喇。

問：好，想問一問，就係你都一路講，就係話你都會展示有鉛同埋無鉛嘅錫線畀學生睇喇？

答：唔。

問：即係兩種？

答：係。

問：我想問一問，就係你有冇教導啲學生點樣去分「一隻無鉛，一隻有鉛，你哋第二時做嘢嗰陣時點樣去分。」你有冇講解呢方面？

答：有。

問：係點樣--即係你點樣教？

答：呢個就基--我哋以往啲師傅都教我哋，就話如果你呢啲係錫料係純錫嘅話，佢嗰個物質係會「靚」身啲嘅，如果係含有鉛嘅話，佢會係因為氧化而暗色咗嘅，咁就利用呢一個方法去分別佢本身究竟呢隻係純錫吖，還是係含有鉛嘅錫料。

問：因為今朝我哋聽到陳生嘅口供，佢都有係講過話可以用嗰個物料嘅色澤嚟到作一個分野嘅，但係佢就話由於可能時間耐咗或者氧化咩嘢，可能就嗰個色澤上面嗰個分別，有鉛、無鉛，並非咁大嘅咋喎，你同唔同意咁嘅講法？

答：如果時間耐嘅話，應該含鉛嗰隻錫料會氧化得係快啲嘅應該。

問：含鉛嗰隻氧化得會快啲？

答：係喇。

問：你當時你展示嗰個有鉛嗰隻物料畀啲學生聽嘅時候，或者我諗睇嘅時候，嗰個含鉛係幾多，你記唔記得？

答：好似係六比四嘅。

問：即係...

答：即係 6.3 至 7.7 咁上下--唔係，3.7 咁上下。

問：六...

答：6.3 至 3.7。

問：即係六比四左右？

答：係喇。

問：即係含鉛就係六十...

答：唔係，唔係。

問：...-- 40 per cent 含鉛？

答：六成嗰個係錫料。

問：六成係錫料？

答：係喇，四成就係鉛。

問：四成係鉛。出產地，兩隻係咪都係一樣㗎？

答：唔一樣，唔一樣。

問：嗰隻有鉛嗰隻喺邊度出產？

答：有鉛嗰隻邊度出產呀？

問：係。

答：哎吔，考起。

問：記唔記得？

答：唔記得喇。

問：都係外國嘅？

答：唔記得喇。吓？

問：係咪外國㗎都係？

答：都係外國嘅。

問：除咗你話睇嗰個焊料嗰個表面嘅色澤，可能可以分話嗰個有鉛、無鉛之外，你仲會唔會同學習講解下有冇其他方法佢哋可以去分別到嗰個有鉛、無鉛嗰兩種物料？

答：譬如喺我哋嗰個錫線上面，佢一綑綑嗰隻嘅話，通常佢都有 label 喺度㗎嘛，咁就用嗰啲 label 嚟去分別。

問：但係嗰啲 label 就用英文㗎喎？

答：吓？

問：Label 係英文寫㗎喎，係咪呀？

答：係呀，係呀，係呀。

問：你就會點樣講番畀啲同學？

答：即係佢上面有囉。

問：因為同學可能英文水準大家有參差嘅。

答：冇，即係話譬如好似你話 99C 咁樣，可能係 99 係錫料，C 係代表嗰個 copper 嗰個物料，即係話喺裏面係解釋畀佢哋聽。

問：明白。即係當時你用嗰隻無鉛個錫線，都有寫住"99C"嘅？

答：有。

問：係咪呀？

答：有，有，有。

問：你呢一隻你自己都用過喇？

答：用過。

問：你幾時開始用呢一隻？

答：呢隻呀？我喺大概係10年嗰陣時已經開始用㗎喇。

問：10年開始？

答：10年已經開始用㗎喇。

問：明白。有冇同學生話特別講到有關英國標準呢樣嘢？

答：有。

問：講解啲乜嘢，關於英國標準，同學生？

答：就係譬如好似我哋啲配件裏面含有錫料嘅，要符合番佢嗰個BS嘅標準，例如個BS標準當時係幾多，我哋就係話--通常嗰啲catalogue都話咗畀我哋聽㗎喇，係864 part 1或者part 2、part 3咁樣。

問：明白。你有冇聽過話抹錫瓜呢一個咁嘅程序？

答：有，我哋嘅年代有。

問：你哋年代有嘅？

答：係。

問：嗰個都係走錫嘅嗰個工序...

答：唔係。

問：...其中一個步驟嚟嘅，係咪呀？

答：佢唔係走錫，佢抹錫瓜係將一啲錫料--呢個係含有少少鉛質嘅物料嚟嘅，當熔解咗之後，就潑上去一個接駁口，呢個接駁口一路一路加大佢之後，就利用一個抹瓜布，將佢抹成一個好似瓜狀嘅嘢，咁就造成一個接駁。

問：好，呢個喺你嗰個短片嗰度就冇特別介紹，我哋之前喺另外一啲短片嗰度就睇過呢一個咁嘅程序嘅，你個人嚟講，呢個抹錫瓜呢一個咁嘅工序，同埋我哋如果用一啲外置嘅錫料嚟到做呢一個焊接嘅水喉嘅工程，係點樣去分幾時用邊一種嘅過程？

答：呢兩樣嘢嚟㗎喎。

主席：我哋唔需要知。

許偉強先生：好，好。

問：你有冇聽過一個話如果大啲嘅直徑嘅銅喉，就係要用呢一個無鉛錫線，如果係細啲嘅直徑嘅銅喉，就要用呢個有鉛嘅錫線呢個咁嘅講法？

答：冇，冇。

問：冇。另外我想問下嗰個工人嗰個做--例如我哋講緊做外置焊料呢一種咁嘅工序，工人做嘅時候嗰個工藝都好緊要，即係佢擺幾多錫料、焊料落去嘅，呢方面，你喺嗰個講解或者喺你嘅示範嗰度，有冇特別同啲學員去強調呢一點？

答：都有。

問：嗰個可唔可以講一講你點樣同佢哋講解呢方面？

答：通常我哋嘅錫料係落落去個 joint 口，如果基本係有鉛嘅物料--sorry，有錫嘅物料，個錫 ring 裏面都係圍住一個圈，基本呢個圈嘅物料已經足夠我哋用，即係話如果呢條錫線走一圈嗰個銅喉嘅 size 已經足夠個 joint 口㗎喇，有時我哋都接觸到呢啲廠家，佢就話呢啲錫料係我哋係用唔晒嘅，有部分可能都流咗出嚟，其實用大概係八成嘅已經足夠。

問：明白，即係有同同學講過，就唔好話過多...

答：冇錯。

問：...去到落嗰個焊料嘅？

答：係，係。

許偉強先生：我冇其他問題。

主席：我想問一問，梁生，返番去你煤氣公司嘅年代，我想問就係譬如你食水，我哋知道就用無鉛，譬如而家--我哋而家純粹講公屋，好多時譬如公屋我哋見到有食水入嘅--即係要用水嘅地方就係廚房同埋廁所嘅啫，基本上喺一個公屋單位裏面就係呢樣，係咪？

答：唔，唔。

主席：廚房食水喉去，我都明，譬如好似廁所咁樣樣，佢可能啲水入去係去個熱水爐嗰度嘅，如果用熱水爐嘅，嗰條喉，嗰條水喉入去個熱水爐同埋出嚟熱水爐嗰個用嘅料有冇唔同呢？

答：有，基本我哋氣體用--即係煤氣爐嗰類嘢，我哋都係用攢栿式嘅接駁嘅，壓接式接駁嘅，走錫方面就係好少用得到嘅。

主席：好少，即係嗰條凍水入熱水爐就攢栿？

答：都攢栿，熱水出嚟嗰度都係攢栿嘅。

主席：熱水出嚟都係攢栿嘅？

答：都係攢栿，係。

主席：就完全唔用呢個...

答：走錫嘅。

主席：唔用錫嘅？

答：係喇，唔用錫嘅。

主席：有冇咩嘢特別嘅原因？

答：應該冇原因，最主要係當時嗰個物料，攢栿係比較盛行，或者...

主席：唔係--哦，得，得，你嗰陣時--即係你做煤氣公司嗰陣時？

答：係喇。

主席：好喇，而家我哋唔講嗰陣時，而家今時今日有冇分別呢？

答：基本就冇分別。

主席：即係...

答：如果你係用走錫嘅話，但係就要小心，因為點解呢？就算個熱水爐嘅水都係同我哋食水係相連到嘅，所以嗰啲物料應該都係無鉛錫料嚟。

主席：得，即係換句話嚟講，無論係廁所或者廚房，基本上成個供水系統都會係要用無鉛嘅焊料？

答：冇錯。

主席：即是換句話嚟講，現在譬如一間公屋個單位裏面其實係冇嘢--其實係冇一個裝置係需要用一啲有鉛嘅錫料去做焊接嘅，係咪咁講？可唔可以咁講？冷氣機--唔係，等陣先。

答：唔係。

主席：對唔住，煤氣，係，煤氣用乜嘢焊料去焊接，煤氣管？

答：煤氣，基本我哋係製瓦嘅。即係「攪」瓦嚟接駁嘅。

主席：就係唔係用...

答：唔係用銅喉，除咗--譬如有啲係 build in 嘅，...（聽不清）嗰類嘢，即係嗰啲櫃面爐，佢都係用攢杭或者係用軟喉嘅上杭嘅方法係接駁。

主席：即係煤氣係有機會用銅喉嘅？

答：都有，都有。

主席：而家係咪用銅喉嘅，而家其實？

答：有，有，有。

主席：因為我唔識。得，即係煤氣有機會用銅喉嘅？

答：係。

主席：不過就個接駁就唔會係焊--唔會走錫，啱吖嘛？

答：係。

主席：即是換句話嚟講，喺一個現在建築嘅公屋裏面基本上係唔會用到有

鉛嘅焊料嘅？係咪咁樣樣？

答：可以咁講。

黎先生：啲去水都唔係銅喉？

主席：去水唔係，個膠喉嚟嘅之嘛，係咪？係咪？

答：去水係膠喉嚟嘅，啱。

主席：冷氣機，房署冇咁好，畀埋冷氣機，係咪呀？房署有冇咁好畀埋冷氣機，Mr --房署有冇人喺度呀？冇吖，應該，係咪呀？房署有冇...

MR DOWNEY：I will take instructions, Mr Chairman.

主席：房署唔會畀埋冷氣機㗎應該？應該冇嘅，係，我都諗唔到會有咁著數嘅嘢出現嘅。

即是換句話嚟講，其實而家一個公屋--起公屋嘅地盤，基本上--都唔係嘅，因為你話有地方係可以用有鉛嘅，譬如有啲停車場，畀人哋洗車，嗰啲基本上唔係食水㗎嘛--係食水，不過...

答：係食水，不...

主席：不過唔係愛嚟食嘅，愛嚟淋花嗰啲，嗰啲理論上可以用有鉛嘅焊料？

答：呢個我就唔敢講，呢樣嘢。

主席：唔知，唔緊要。

答：唔敢講。

主席：唔緊要，得。你嗰陣時考二級水喉匠嗰陣時，1977，需唔需要考呢個水務條例？

答：唔需要，因為二級裏面係唔需要考呢個條例嘅，除咗係一級啫。

主席：一級就要？

答：係喇，係喇，係喇。

主席：哦，即係去到92年先至要？

答：因為二級牌係做一啲係簡單嘅維修，即係過咗水錶後嘅維修嘅啫，但係如果係一級嘅話，就要申請水錶，又要入紙，要入一啲圖嗰類嘢，就要一級去做。

主席：得，所以喺1977年你考嗰陣時候就完全唔需要知道BS864 part 2係講咩嘢？

答：都知，都知。

主席：都知㗎喇已經？

答：都知，因為喺讀書過程裏面學到㗎嘛。

主席：1977年864就好似...

答：因為喺煤氣公司嗰度，我哋接觸嗰啲銅喉嗰類嘢嘅，佢裏面有啲先生都會講畀我哋聽嘅，但係你話sure唔sure係真係喺嗰段時間講呢，我就即係好難係咪...

主席:因為864就好似係1983年先至出嘅,之前可能有另外一個British Standard，我唔知喇。

答：好細嘅嗰本嘢係。

主席：得。

黎先生：你喺92年考一級水喉匠嗰陣時，你已經做緊二級導師㗎喇？

答：啱，冇錯。

黎先生：你使唔使上堂，你考試嗰陣時？使唔使...

答：考試嗰陣時，唔需要上堂。

黎先生：你冇上堂，唔需要？

答：嗰陣時我冇，自修嘅。

黎先生：冇嘅？

答：冇。

黎先生：即係嗰陣時未有嗰個 course，有未呀？5676？

答:因為 92 年之前,嗰個 5267 係唔需要係做嗰個實習嗰樣嘢嘅,淨係...

主席：1992 年你就上咗 5267 吖嘛？

答：係，因為我張證書都係 1991 年發咗畀我嘅，係月尾嘅喇，大概係唔知 11 月定 12 月嘅畀我嘅，所以我就 count 為 1992，就係咁解。

主席：得，即係你有上過個堂嘅？

答：有。

主席：上完堂之後有冇考試？

答：有，梗要考試。

主席：有，有，即係考筆試同埋考口試？

答：筆試，冇口試，淨係筆試啫，因為嗰陣時就係畀咗係 VTC 嗰面去係進行嘅，水務署，所以淨係有啲水務官嚟教...

主席：哦，得，得，得，明白，明白，明白，明白。因為你唔係之前嗰啲嚟嘅，得。你話喺煤氣公司嗰度嗰陣時教你用銅喉，即係講緊一九七幾年嘅時候？

答：係。

主席：已經教你唔可以用有鉛嘅焊料？

答：係。

主席：點解煤氣公司嗰陣時候會教你哋要用無鉛嘅焊料？即係有啲乜嘢原

因佢要咁教你呢？

答：因為我哋頭先都講過，就係因為我哋要喺爐具接駁冷熱水都好，係同我哋嘅供水有關㗎嘛，所以佢好強調就係話講呢樣嘢。

主席：得。好，請問有冇其他人有問題？冇。

好，唔該晒你，梁先生，好多謝你嚟畀證供，可以離開，唔該晒。

答：唔該晒。

主席：有冇證人，今日仲？

許偉強先生：跟住就--今日就冇，因為關於嗰個水喉及潔具商會，就應該係聽日佢哋嘅證人會嚟嘅。

主席：好。

許偉強先生：聽日我哋會完成咗佢哋嗰邊嘅證供之後，就下個禮拜一開始就係水務署嗰邊嘅證人。

主席：好呀。我哋今日嘅審訊就去到呢一度，好，我哋聽朝早 10 點鐘再見，唔該。

2016年1月28日

下午3時27分聆訊押後

Thursday, 28 January 2016

(10.04 am)

(Transcript of simultaneous interpretation
except where otherwise specified)

MR LO WING HONG (on former affirmation)

Cross-examination by MR KHAW (continued)

MR KHAW: Good morning, Mr Lo. I have some more questions for you.

Yesterday, we viewed the video clips. First of all, we saw that there was an instructor demonstrating the different ways of jointing pipes.

We understand that he is Mr Leung, an instructor of VTC.

A. Right.

Q. Let's put that aside because I will be asking Mr Leung questions on the procedure.

Just focus on the first and the last video clips shown yesterday. As I understand, in your witness statement, the first clip is the Housing Society's clip; for the last one, it's the Copper Development Centre's video.

Let's talk about the Housing Society's video clip. When did the VTC start to use that video clip?

A. As I understand, it was after the year 2010.

Q. After 2010. What about the other one, Copper

Development Centre's clip?

A. The same, after 2010.

Q. Around the same time?

A. Yes.

Q. So, as far as you are concerned, have you ever, in your class or any plumbing course, shown these video clips?

A. No, I did not take part in teaching these courses, so I did not.

Q. Let's turn to paragraph 46 of your statement. Let's pause here. W1, page 21.

We see here that you refer to the TLP and notes of jointing methods. Then, further down, you said:

"(In English) Although its contents have not been amended to reflect the availability of lead-free soldering materials in the market at the time, I have confirmed with all the current instructors and teachers that on top of the teaching notes, they, when teaching the topic on soldering, have adopted the videos either developed by the Copper Development Centre or the Housing Society to facilitate their teaching in the classroom."

So we can see that for the first clip related to the Housing Society, it's mentioned that lead-free soldering Powerflow Flux should be used, but lead-free soldering materials isn't mentioned. However, in the second video

clip, it was mentioned. So when you said "(In English) have adopted the videos" here, do you mean that in class, when the videos were shown to students, the videos were adopted?

A. Right.

Q. So, when these videos were shown, which course are you referring to? Is it the three-year course or is it the short course?

A. The three-year craft course.

Q. Craft certificate course?

A. Right.

Q. For craft certificate, you asked the instructors, and was it the case that the videos would be shown when talking about soldering, or on what occasion would it be shown?

A. I don't know exactly which topic, but I suppose it's pipework and installation. And Mr Chan Tze Kin, one of the instructors who will be giving evidence later, has taught this topic before.

Q. Yes. I will ask him in a moment.

So, in relation to these two video clips, would they be shown together or would they be shown at different times throughout the course?

A. Well, I didn't ask the details so I will ask Mr Chan later.

Q. Another point on the course arrangement -- on the three-year course, did you, Mr Lo, take part in the course syllabus arrangement?

A. No.

Q. As for the other one, the short course, did you take part in it personally?

A. No.

Q. In setting the syllabus, I believe it should be the construction department which is responsible.

A. Right.

Q. Let's say for the three-year course, apart from topics related to plumbing, there are some general topics such as science, calculations, et cetera. I want to know whether there is a specific plumbing division in the VTC in the construction department, responsible for preparing the teaching materials.

A. No, not a specific division, but we have three campuses, Tuen Mun, Tsing Yi and Morrison Hill, under the construction department, and the course team would be responsible for each course, and the colleagues responsible for teaching the relevant topics would put their heads together in preparing the syllabus.

Q. For the three-year course, would the course team comprise plumbing experts?

A. Yes. Apart from participation from colleagues of our

department, for this course you can see that through the liaison or the working party meeting, the Water Supplies Department would also be consulted when there were major changes to the course.

Q. I have a question for you. Page 483.1. On page 483.1, under point 3, that's 8 March 2006, a discussion on certain matters between your department and the Water Supplies Department's representative.

Then there is a "Complain case of 56767" under paragraph 3:

"(In English) Chairman informed members regarding a recent complaint against 56767 in the newspaper. The purpose of this meeting was trying to collect mutual agreement among members in regards to admission standard, and better passing rate ...", et cetera.

So I assume that there had been a complaint in relation to admission or examination, and then there was this discussion:

"(In English) After lengthy discussion, various measures/proposals have been discussed. The following proposals were formulated for WSD's consideration:

-- An extra module of 21 hours plumbing practice will be added to the course making up to total of 60 hours. At the end of the course, there will be examinations in theory and practical skill as the

current situation."

So, first of all, there was a suggestion to add the total number of hours to 60. Was it implemented?

A. No. But it was handled in another way, as you can see in a moment.

Q. Then following:

"(In English) If applicants equipped with the required practical skills/training, eg possessing of 53776, 55776 ..."

That is 266 and 268, these two courses.

"(In English)... or intermediate trade test certificate (plumbing), they can apply exemption on studying the 21 hours' plumbing practice. But they still need to pass the relevant examinations ... as now."

So it seems to suggest here that if you had undertaken course 266 or 268 or if you had the intermediate trade test certificate -- first of all, for the intermediate trade test certificate, was VTC in charge?

A. No. It was the CIC's semi-skilled trade test.

Q. Yes, that's the course for semi-skilled workers.

CHAIRMAN: So after registration for semi-skilled workers, they would not be required to study the 21 hours?

A. That was the recommendation at the time.

CHAIRMAN: So for skilled or semi-skilled workers, at that time, how would they get the licence, as licensed plumbers?

A. No other alternative at the time. They needed to undergo the three-year course followed by a test.

CHAIRMAN: So they had no other alternative but to undertake a course in VTC?

A. No, they would be qualified after studying the course.

COMMISSIONER LAI: So for semi-skilled craft training, there was no use at all?

A. Not necessarily, but they would be required to undergo a three-year course in VTC.

COMMISSIONER LAI: No bridging course?

A. Perhaps exemption.

COMMISSIONER LAI: But any exemption?

A. No, nothing at all.

COMMISSIONER LAI: Are there any other short courses?

A. No.

MR KHAW: So it's mentioned here that if you have the semi-skilled qualification or you had taken 226 268, and when you take the short course, 267, you can get some exemptions, and that would save the 21 hours?

A. But that has not been implemented. Let me give a detailed explanation, so the Commission or chairman can understand.

We had received complaints before regarding the course. The semi-skilled workers have some misunderstanding about these courses. It's called a course, and we understand the nature; it's actually an examination. So some people, when they fail, they blame the VTC; why do they run courses that lead to failure? It should include training; they should allow candidates to pass.

So you can see that the nature -- it's an examination. You shouldn't call it a course. It's an examination arrangement.

So we had some internal discussions on how to resolve the issue, how to face these realities. So we did a study, which people have a higher pass rate, which people have a higher fail rate, so we did some analysis. Some people had not taken the 53776 course and 55776, so they might have a weaker practical training, so the pass rate for the practical test was very low. So with those people, as I explained yesterday, they tend to complain, they have very strong reasons for their complaints.

COMMISSIONER LAI: I would like to ask -- so the exempted people, they might have a degree, they might be engineers, so they can be exempted from the three years?

A. They are totally exempt.

We found that they were weak in the practical test,

so we suggested we needed to add another module of 21-hour training, to train the practical component.

So why do we have an exemption? For those who have taken the three-year course or who have the intermediate or semi-skilled licence, they are very strong in the practical skills, so we have an additional 21 hours of training. So these 21 hours are designed for people to enhance their practical skills.

But after some discussion, you understand -- why was it not adopted, I conjecture, I guess that they didn't want to change the nature of the course.

So how did we solve the problem? In the notes, you will see that the 21 hours had become an extra short course, and that wasn't mandatory. It was an elective; they could take the course if they wanted. If they felt that their practical skills weren't up to par, then they could take the course and enhance their pass rate.

So in the following minutes of meeting, we had a discussion regarding this approach.

I need to spend some time to find the information.

Okay. On page 492, in 2009, 8 January, in 5.2, we launched the 21-hour short course. It says we tried to organise a 21-hour short course prior to the practical examination. But not too many students enrolled.

MR KHAW: It was an extra course?

A. Yes.

Q. It was an elective.

A. Yes.

Q. So originally you had wanted a 21-hour course to serve as an exemption, but the fact of --

A. The nature. Well, that's my personal judgment.

Q. Then this 21-hour extra course was introduced for people with equivalent qualifications, you wanted them to enrol, but it wasn't that popular.

A. Correct. So the people who needed to take it didn't take the course.

Q. So up till now, we don't have any framework for people who have skilled licence or semi-skilled licence; they don't have any arrangement to take the course 5267?

A. No, that is correct.

MR KHAW: I have no other questions.

Questioning by THE COMMISSIONERS

COMMISSIONER LAI: I would like to ask Mr Lo, when you drafted the course curriculum, did you make reference to the Housing Authority, Housing Department building specifications? Because I see we have a lot of PRH projects, there are a lot of specifications in the engineering works, and some of these are related to plumbing. So, when you draft curriculum, do you make reference to their building specifications in designing

your courses?

A. Well, between 2001 and 2004, I did not participate in that, so I can only respond in general. When we design courses, we need to make reference to market practice.

So it's not just Housing specifications. There are DSD or even private practice; we need to consider these as well, because when you draft a course, we have our colleagues working on it. We also invite industry participants to contribute.

As I said before, aside from the course curriculum committee, when the course is launched or before it is launched, there is a verification process. We need an independent panel, people who are not connected to designing the course. We also have colleagues from the VTC and they will give us recommendations.

On this incident, you can see the material I submitted, it's prior to the incident. We had conducted a review after the incident. Even recently in the Housing Authority report we have made improvements. So in our new intake of students, even for the three-year basic craft course, you see that the TLP has been updated, and one part is in line with the Housing Authority recommendations, how to differentiate between leaded and lead-free material; we have included that in the curriculum.

They have also recommended that they should use a hand-held XRF analyser to analyse the composition of the alloys. So if we feel it is feasible, we will introduce that into our curriculum.

Aside from that, the Housing Authority also suggested that we need to enhance students' knowledge. So that has been introduced in TLP, and Mr Chan Tze Kin will talk about that as well. In our nine circular letter, that has been introduced into the TLP. In relevant sections we have also highlighted WHO standards regarding the contamination of water by heavy metals. We want to enhance our students' knowledge, not just regarding the Hong Kong legislation, but water quality in general.

COMMISSIONER LAI: So this is after the incident. I am talking about prior to the incident; did you have any mechanism?

A. We relied on what I mentioned. When a new course is launched, it has to go through validation. So, after validation, the work hasn't ended; there's also a revalidation process. There is a validity period for each course. During that period, we need to review the course, to see if it meets QA requirements, and the validation process will allow the course to continue to run.

So, every year, the course team, they have to conduct an annual review. There is a QA system to ensure the course meets market needs.

Further cross-examination by MR KHAW

MR KHAW: I would just like to follow up on the point. You said, after the incident, you had taken on board industry opinions and you have amended the TLP content.

Referring to the bundles, page 790, we see tin solder. You had made some amendments in 2015; this is the new version.

Just now, I heard, regarding Mr Lai's question, you would amend the courses, and you are undertaking this process when you develop courses, when you teach courses; you want the students to understand the nature of solder material, it should be lead-free.

So how do you differentiate solder material between leaded and lead-free material? Have you considered how students can have a more thorough understanding of the material they are using? How can they know definitely whether the material they are using is appropriate?

A. Well, you see that in the industry, there are some solvents, formulas. It's like a stick. Mr Leung can elaborate further. There is a chemical compound and there's a sponge. It will change colour when it comes into contact with lead. That's the easiest way to test

whether the material contains lead.

So whether there was lead or not in 2004, when we had a meeting with the WSD, we had raised this question. The instructors were aware that we should have this test, but unfortunately, at the time, the industry couldn't procure these items. It wasn't that common. But now, after the incident, we can buy these chemical test kits.

So aside from that method, Mr Leung Man will also tell you, you can tell visually, you can differentiate the material. And we also have a high-tech solution; we have an XRF analyser. This not only can detect lead; all heavy metals can be identified as well. So we are looking at whether to introduce this into our courses.

MR KHAW: Okay. Thank you.

Cross-examination by MR YIN

MR YIN: Mr Lo, I would also like to follow up.

INTERPRETER: The speaker is not speaking into the microphone.

MR YIN: (Chinese spoken). How to differentiate lead, there are many ways. You can use equipment, you can look at the package, if it's a green roll, and you can read the labels. But you mentioned that you can also conduct a visual inspection.

We know that if it contains lead, if solder contains

lead, if it's lead-free, if it's tin, it's shiny, whereas if it contains lead, it's dull?

A. Well, that's what the instructors told me.

Q. We heard witnesses say, when you use it, if you are experienced, an experienced plumber, when they solder the material, they can tell from the viscosity, the melting temperature; they can tell. So this is a way of distinguishing the two?

A. I haven't tried it before, but I think you can ask Mr Leung.

Q. So can we put it this way: after the lead in water incident happened last July, the focus hasn't been on distinguishing between leaded and lead-free soldering materials?

A. I think before the incident happened, there wasn't much emphasis, but it was included in the course.

In terms of how shiny it is, I don't think it is a reliable method, because you need to have two to make a comparison. So unless you have lead-free materials ready for comparison. But I think, as you can see in the minutes of the meeting with the WSD representatives, the label is one easy distinction, unless the label is bogus. So if it says "lead-free" on the label, then clearly it's lead-free. If it's 50 per cent lead, then you can see easily that it contains 50 per cent lead,

and judging by common sense, we understand that lead is toxic, and this is also taught in the course.

Q. I am not talking about the shortcoming of your course. I am just trying to find out more about your course. Yes, lead-free materials should be used for fresh water supply. However, because of the limitation of the knowledge of the lecturer, some questions are left unanswered.

A. Of course, many topics in a plumbing course are important, but all of sudden, because of the incident, this topic has become more important, and of course course content should reflect changes in the industry, and it is correct that we should place more emphasis on it after the incident happened.

Q. Because I see that there is this topic called "Craft Theory", your course?

A. Yes.

Q. I am not just referring to leaded or lead-free soldering materials, but other kinds of materials. In fact, for different solder materials, the pros and cons, the comparison, say which one is easier to use, which one has a higher toxicity and which one should not be used -- all these kinds of knowledge, theory, how much would be taught to the students, or is it the case that you won't go into too much detail?

A. No, we do go into details. Previously, it was called "Craft Theory 1", and now it's called "Pipework Installation 1". You can see that it's already in the notes of this topic, before the incident happened. We talked about the different characteristics of different materials: copper, lead, tin, and so on and so forth. You can see in the notes, it is said that lead is toxic.

Let me check. It's page 525, paragraph 2, "Materials". You can see we cover a wide scope of materials. For copper, you can see that under some circumstances there may be chemical reaction and it may become toxic.

2.2, the second one, "Copper": when reacting with acid, copper may turn acidic and toxic. So it's very comprehensive. Different jointing methods; we talk about metals as well and non-metals.

Page 527, plastic materials. As for the pipe jointing with different materials, we also have notes covering that.

On page 541, "Copper pipe jointing", three methods, and then ductile iron pipe installation.

Q. I understand that. But apart from the difference between leaded and lead-free soldering material being the fact that leaded one is toxic, functionally speaking, for example, leaded joint may have a better

pressure rating than a lead-free one, and for soldering alloy, we understand that leaded material will seep better into capillary joints.

So, for lead-free solder, Powerflow Flux will be required to facilitate the seepage of solder into the void. However, would the lecturer tell students that if you use leaded material it may seep into drinking water?

A. I cannot tell you what actually was taught by the lecturer in class. But we can see from the notes and also in the examination, this is covered. The students would be tested on the change in melting point if lead is added. So, basically reflecting the theory you mentioned.

But I want to emphasise another point. This is a craft theory course, so craft theory is important, but for the remaining two-thirds of the course, we emphasise hands-on experience, so after teaching students the theory, the more important thing is to help students acquire practical skills. You see in one of the videos, the copper pipe was burnt.

Q. Another question on British Standards. You know that in the Waterworks Ordinance, the British Standard was referred to. Of course, we have bilingual legislation in Hong Kong.

But basically, for reference to the British

Standard, there is no Chinese version; do you agree?

A. Yes.

Q. Yesterday, when asked by Mr Khaw, you agreed, and my understanding is that you agreed that apart from the admission requirement that the students should have either form 3 or P6 qualification, there is no requirement that the students should have a certain level of English proficiency?

A. Agree.

Q. Yesterday, you also said that the course couldn't cover everything in the British Standard; you could only selectively teach about the British Standards.

And we have read the British Standard; it's actually not easy to understand. It's quite demanding in terms of English proficiency. So for students with secondary 3 education level, they may not be able to read the British Standard; do you agree?

A. This is the admission requirement, but it depends on the background of individual students. Before taking the test, the student would be required to undertake 39 hours' course, and there would be tests on local requirements as well as British Standard requirements. So, if the students are able to pass the test, then in the four years of work experience the students may have acquired relevant knowledge for the student to pass the

test.

It's true that for craft certificate, the students may have a lower level of language proficiency and the passing rate of the craft theory paper also reflects that.

As for those in the institute, they have a higher level of language proficiency and the passing rate also reflects that. So if a student is not good at the British Standard, then the student should study harder. Apart from the three-year course, this is also one of the major elements for one to pass the exam as licensed plumber.

Q. This is exactly the point. We understand, in the industry, a worker will not cover all types of materials and all types of chemicals. Usually, only 20 or 30 per cent -- for example, those prevailing in the market -- yes, you may have heard of other brands, but say in Hong Kong everyone is using this green one, the brand called FRY. So would it be possible that if the worker doesn't understand --

CHAIRMAN: Well, Mr Yin, I think your questions are really too general. Even for PCLL course, you only cover basic theories. You have the LLB and PCLL and you have been a counsel for so many years. Would you agree that the courses teach really specific knowledge?

MR YIN: No.

CHAIRMAN: But the point is, if we are talking about how detailed the course content should be. The craft certificate course is for those form 3 school leavers with four years of experience, they have the practical skills, and we need people to be LPs. Of course, if everyone could have a PhD, then they would be the best, but it wouldn't be possible.

MR YIN: I am not criticising them.

CHAIRMAN: All right. I get your point.

Any other questions? No?

Re-examination by MR NIP

MR NIP: Chairman, I have a number of questions. Just two questions.

Mr Lo, yesterday Mr Khaw asked about annexure 14 of your witness statement. Would you please turn to page 563. Mr Khaw yesterday asked about soldering on this page, and that there is no specific description that the solder material should be lead-free. You said that in fact your colleague mentioned in the video clip and in other places.

So I would like to refer you to the last paragraph of your witness statement, page 26, paragraph 29. You gave a very clear summary. Subparagraph (1), you talk about the videos, and in subparagraphs (2) and (3), you

talked about other areas of your course in which lead-free soldering materials were mentioned.

A. Correct. The first one is just one of the TLPs. You must understand that back then, apart from notes, verbal delivery was also important in the course, especially when there was no PowerPoint and no video demonstration back then. And for these students with secondary form -- and the three-year course, they would be required to take handwritten notes, for them to memorise the content better.

What is more important is the practical skills or plumbing practice. In that practical module, the actual soldering materials would be shown to students, to see the difference. Also, the final gatekeeper, the 39-hour course followed by the exam, we would remind students once again that as a licensed plumber, there would be requirements to meet.

Q. Yesterday, Mr Khaw also mentioned about test papers, some "yes" or "no" questions, whether lead is toxic. You said yesterday that definitely it will be mentioned in the TLP, and you just confirmed this again this morning, and you walked the Commission through page 525 just now.

A. Correct.

Q. You see that there are different characteristics of

different metals, and the third item, lead, it says it's toxic.

A. Well, you see the notes refer to that and the exam also covered this, so students should know that lead is poisonous.

MR NIP: I have no other questions.

CHAIRMAN: Thank you, Mr Lo. You can leave now.

MR NIP: Chairman, my next witness is Chan Tze Kin.

MR CHAN TZE KIN (affirmed)

CHAIRMAN: Please take a seat, Mr Chan.

Examination-in-chief by MR NIP

MR NIP: Mr Chan, please refer to your witness statement. Please turn to page 8 of your statement. There's a signature there.

A. Yes.

Q. Is that your signature?

A. Yes.

Q. There's also your signature on page 9?

A. Yes.

Q. I will read your statement to you and then I will ask you some questions.

A. Okay.

(Statement read in English)

So, Mr Chan, I just read out your witness statement, and I would like you to refer to page 7, paragraph 25,

which I just read out. The third line from the bottom, subparagraph (4), "The effect of lead on heath" -- it should be "health"; right?

A. Yes.

Q. Apart from that, can you confirm that the statement is true and accurate?

A. Yes.

Q. Would you adopt the statement as evidence in this hearing?

A. Yes.

MR NIP: Mr Chairman, I have no other questions.

Cross-examination by MR KHAW

MR KHAW: Good morning, Mr Chan. I have some questions for you on your qualifications. Paragraph 2 of your witness statement sets out your qualifications.

Between 1981 and 1983, you studied the craft certificate in plumbing and pipefitting in Haking Wong Technical Institute. That's course number 286. Was it a three-year course?

A. Yes.

Q. According to the structure then, at that time, after studying the 286, there wasn't the short course. So if you wanted to apply to the WSD to become an LP, you needed to take the WSD's exam; right?

A. Yes.

Q. What was the exam about?

A. The exam was about the Waterworks Ordinance and whether you were in the industry. It was a two-part exam, written exam, and also an interview. That is, to be interviewed by WSD officials.

Q. For the written test, did it include drawings?

A. Yes.

Q. Any multiple-choice questions, apart from drawing?

A. No, not in my recollection.

Q. Anything in relation to the procedure of jointing pipes by soldering? Any exemption in the exam, I mean?

A. For exemption -- because it covered everything in the Waterworks Ordinance. So I suppose it covers everything in the Waterworks Ordinance.

Q. So, on jointing pipes by soldering, were there any questions in the exam? Was there any demonstration required?

A. No, not at the time.

CHAIRMAN: I want to know more about the exam at the time, because in this incident, several licensed plumbers obtained their licences in the 1980s, so I would like to know more about that.

Mr Khaw just now asked about a written test and an interview, as you put it. Was it actually an oral test?

A. Yes.

CHAIRMAN: So what was it about?

A. It covered a wide scope. The questions were related to the Waterworks Ordinance, how to apply for water meter, how to submit forms, maybe on pipe installation as well. It was done in the form of a conversation.

CHAIRMAN: Of course, the Waterworks Ordinance back then might be different from the current Ordinance. We understand that there are provisions in either the Ordinance or the Regulations on the types of pipes that can be used: copper pipes, GI pipes, or PVC-lined GI pipes; it's also covered in the course.

So when the Waterworks Ordinance was tested in the oral test, was there anything about the materials, the pipe materials? In the current legislation, it includes the BS standards, but back then, did the legislation cover British Standards?

A. Well, it's been 30 years since I obtained the licence, so I'm recalling from memory. Of course, the legislation was different then, but I guess the spirit is more or less the same. So I recall that it also referred to the British Standards.

CHAIRMAN: So we understand that for copper pipes, there was a British Standard in 1983, and you became a licensed plumber in 1984. That is, British Standard 864. So, if

it was mentioned in the Waterworks Ordinance, it should refer to 864?

A. I think the standards were in relation to the components for compression jointing and soldering.

CHAIRMAN: Right, because in 864, solder materials were mentioned.

A. Right.

CHAIRMAN: Of course, my understanding is that for 864, it had been constantly updated and revised, and then there was this table 17 which didn't appear until 1987. It should be in 1987 when table 17 appeared. I suppose you don't remember; right? I just want to confirm this, because for 5.2, under 864, it is solder. I don't know where I can find it.

MR YIN: Chairman, perhaps I can assist. As I understand, the Water Byelaws Act was enacted in 1987 in the UK.

CHAIRMAN: I am not talking about the Water Byelaws. I'm talking about the British Standards.

We came across 864 in our hearing. The original version differed slightly to the subsequent versions of 864, so let me find the relevant document to show you first, because this is not a memory test.

MR KHAW: It should be C19.1.

CHAIRMAN: Which page?

MR KHAW: Tab 122, page 10427.

CHAIRMAN: This is page 10427?

MR KHAW: Right.

CHAIRMAN: This is provided by the Water Supplies Department?

MR KHAW: Yes.

CHAIRMAN: I believe this was promulgated in 1983.

MR KHAW: Yes, 1983.

CHAIRMAN: Let's turn to page 10428. At the bottom, "Amendments issued since publication", and then amendment No. 5651, April 1987. I tried to trace when table 17 started to appear, because if you turn to 10444, that's table 17, which specifically talked about tin/copper 99C, the maximum composition of lead should be 0.1 per cent. That's in the fourth column.

However, this specific description of the maximum composition of lead in table 17 didn't appear until 1987. Between 1983 and 1987, there were different versions, and I suppose it was also stipulated that lead-free solders should be used, only that the specific maximum composition of lead wasn't mentioned, because as we understand, even for the description "lead-free", a maximum composition percentage was allowed. That is to allow for impurities.

So in 1983 or 1984, when you obtained the qualification as a licensed plumber, if the oral test

involves the Waterworks Ordinance, because as we understand the 864 had all along been used by the Water Supplies Department and it was questioned by some, why there hadn't been any change, but of course back then you had no idea what the examiner would ask, but was it already included in the Waterworks Ordinance, and that you were required to at least have some general knowledge about the existence of this table?

A. It was a long time ago when I joined the industry. There wasn't a strong emphasis on the lead content. But we had some knowledge.

When I first came across the topic, we were learning about the different characteristics of different metals.

CHAIRMAN: So you are taking about 1981, when you first studied the course?

A. Yes. In the notes, I suppose it was also mentioned that lead is toxic. For example, in pipe installation, we needed to come across lead, that is for drainage pipe installation, pipe or lead or quarter lead joint would be used.

CHAIRMAN: So when you first started studying, you knew that lead was harmful, so you know it's harmful.

Coming back to the question, or put another way, when you took your licensed plumber examination in 1984, you are aware that for the fresh water supply system, it

shouldn't contain leaded material?

A. Yes.

CHAIRMAN: Okay. So, when you started your studies and you took your licensed plumber exam in 1984, did you ever do practical work in the field?

A. Yes.

CHAIRMAN: So, when you did the hands-on work, at the time were workers aware of the situation; that is, fresh water supply system, you should not use lead components or lead pipes, and so on?

A. Well, when I did my practical work, some workers might neglect that. Some knew, some didn't.

CHAIRMAN: Okay. But were there any licensed plumbers that weren't aware?

A. Well, if you're a licensed plumber, then you should have some knowledge of this. I personally have some knowledge.

CHAIRMAN: That's because you went through the three-year vocational training. We know that some licensed plumbers didn't go through formal training. Are you aware? You know that some people didn't go through formal training; they had just apprenticed. So, for those licensed plumbers, were they aware that there shouldn't be lead in the fresh water supply system? Were you aware of that?

A. Well, as a professional plumber, then I personally -- I am aware, because when you do plumbing works, it's quite comprehensive, but of course some people might be negligent, so they might have gaps in their knowledge.

MR KHAW: In your evidence, you say that starting from 1984 you were a licensed plumber, and you answered the chairman's question that you did do practical work. So, when you say "practical work", do you mean that you were acting as a licensed plumber in the construction site?

A. Well, not licensed plumber. When I said "practical work", I had acted as a technician.

Q. You did the hands-on work?

A. Yes.

CHAIRMAN: So, after getting your licensed plumber licence, you hadn't taken on work related to being a licensed plumber, but you were working as a technician in a construction site; right?

A. Well, after getting my licensed plumber qualification, I had worked for contractors and worked as a technician.

MR KHAW: When you say "plumbing technician", in 1984, you were doing welding works. Can you tell us what type of welding works you were doing?

A. Well, we had -- the elbow joints that contained solder were very popular at that time.

Q. The built-in --

CHAIRMAN: So, starting from 1984, you had copper pipe experience?

A. Yes.

MR KHAW: So those construction projects, were they private projects or government projects?

A. At the time, some were private, for example the Kai Tak airport, the canteens.

Q. So, as a technician, how long did you act as a technician?

A. Roughly two or three years.

Q. As a technician, did you ever come across solder materials connecting copper pipes? I don't mean the self-contained elbows.

A. Well, at that time, it was rather rare.

Q. But you did do that work?

A. I didn't do that work.

Q. So the projects that you participated in, have you seen workers doing that?

A. No.

CHAIRMAN: Back then, you would use self-contained solder elbow joints. If there were leaks or test failures, did you have to reapply solder, for failed joints?

A. Even we had -- self-contained solder was very popular, but the technicians, they could see whether the skill was good. If their skill was good, then in principle

you do not need to reapply solder. It depends on skill. But if your skill is not up to standard, not up to par, it will leak, and so on, and they need to reapply solder.

MR KHAW: So, at the time, when you worked on self-contained solder elbow joints, were you aware that there were lead-free requirements?

A. Well, I knew that the components that arrived complied with BS 864. So, in my studies and in my fieldwork, you could see the labelling, what standards they complied with. For example, the galvanised pipes, they would say that they comply with BS 1387 and so on.

Q. So you would also see the labels?

A. Yes.

Q. They complied with British Standards?

A. Yes.

Q. I would like to ask -- you worked as a technician for two or three years. Did you act as a licensed plumber formally?

A. No.

CHAIRMAN: So, in other words, Mr Chan, that means, back in the 1980s, if you did plumbing installation work, so even if you did not study 864, but when you did welding works of these components, there was an opportunity that you would encounter the components you mentioned; you

said it was compliant with 864. You would know it contained solder, it was safe solder?

A. Well, it should be. At that time, we just inspect the label, we would refer to the label.

MR KHAW: You would inspect the packaging?

A. (Nodded head).

Q. If it complied with the British Standards, it would comply with WSD standards?

A. Yes. Well, you would have to trust the supplier.

CHAIRMAN: Well, that's the worker. What about the LP? He should be aware, because theoretically, he should be more knowledgeable than the technicians.

A. Yes, he should know better.

MR KHAW: Regarding solder material, I don't mean the self-contained type, but when you actually have to apply solder -- you have heard different names. Some people call it solder wire or solder strip. So I would like to ask, for these types of solder material, regardless of the name, it is not self-contained. So when did you encounter that material?

A. Generally speaking, if I remember correctly, around 1987.

Q. And you were a technician?

A. I was a technician. I was working in Hongkong Electric.

Q. So, in the projects you participated, you encountered

that material?

A. Well, at the time, I was responsible for the Lamma power plant, I was responsible for property maintenance.

CHAIRMAN: It was just fresh water plumbing.

A. I was responsible for plumbing works.

COMMISSIONER LAI: Did it require your LP qualification?

A. When I took the job, they had that requirement. They required LP qualifications.

COMMISSIONER LAI: So even though you had not acted as an LP, but your LP qualifications were Hongkong Electric's job requirements?

A. Yes.

MR KHAW: So you were a company employee back then, and when you encountered the project, the maintenance work, did you use that solder material?

A. Yes.

Q. Was it this material? (Indicating green reel).

CHAIRMAN: Well, if it's lead-free -- it's not necessarily that brand.

A. We purchased lead-free solder, but whether it was this brand, I'm not sure.

CHAIRMAN: Well, that company has been acquired many times.

MR KHAW: So how do you know that it was lead-free?

A. It's like your roll. It has a label, and a lot of times, when we procure material, we indicated we wanted

lead-free material.

Q. So this lead-free solder material, was it in rolls or strips?

A. The lead-free material I encountered was in rolls.

CHAIRMAN: Have you seen strips of lead-free material? We don't mean strips that were cut from the solder wire. Do we have lead-free solder that is manufactured in strips?

A. I have encountered solder strips, but whether it's lead-free, you would have to refer to the label. So, for solder strip, when solder wire wasn't popular we had to use solder strip, but solder strip requires more work. You have to melt it down for application.

CHAIRMAN: Let me clarify. You are saying that in the old case, before we had solder wire, you mean we had lead-free solder strip?

A. I wasn't sure because we were using elbow joints.

CHAIRMAN: So, when you use lead-free solder material, it came in rolls?

A. Yes.

MR KHAW: Just now you mentioned you have seen strips with labels. So you said you would have to refer to the packaging and labels. So when you encountered solder strips, the packaging, did it indicate it was lead-free?

A. Some technicians would use that, but it would contain

lead.

Q. So when you see strips, solder strips, as far as you recall, that solder material contains lead?

A. Well, some contained lead, some would not contain lead.

Q. So you believe that some don't contain lead. Was it because you have seen some labels showing that it was lead-free or have you heard from others that it is lead-free?

A. Because for solders, very often it depends on the quality, whether it is lead-free or not. Even if we buy solder wire, sometimes it may contain lead. The shape or form doesn't affect its quality. Of course, if you specify in your purchase that it is lead-free, then the standard should be lead-free.

Q. You said you came across solder strips, and you understand that, from the packaging, some contained lead. Did you come across the use of leaded material in fresh water works?

A. No.

CHAIRMAN: So you mean solder strips containing lead?

MR KHAW: Yes.

CHAIRMAN: But you also mentioned, in the course work, that is for copper pipes, it's not just used in plumbing; it's also used in heating system. So I understand heating system. What about gas transmission?

A. Sometimes, when you connect stoves, LPG, et cetera, or if you need gas in a laboratory, then copper pipes might be needed for connecting pipes.

CHAIRMAN: That's for gas in laboratory, bunsen burners?

A. Yes, for experiments.

CHAIRMAN: In that case, copper pipes can be used, but then leaded materials can also be used because it doesn't involve fresh water supply?

A. Right, because for air-conditioning or radiant heat, that is for heating pipes installed underground. If it's not for potable water supply, then theoretically leaded solders can be used.

MR KHAW: Now, for solder wire in rolls or in reels, was there a practice for solder wire to be cut into segments before use?

A. You mean my practice? My practice is that I would use the whole roll or reel.

Q. We heard about the practice of workers cutting the rolls of solder wire into strips.

A. My understanding is that maybe it was more convenient for workers, because it would be quite heavy to hold the whole reel in the hand. It might not be very convenient for workers, so it would be easier to carry for workers to cut them into segments.

Q. So, as far as you know, this is a rather common

practice?

A. Yes, it is a practice adopted by some workers.

CHAIRMAN: Let's take a morning break for 20 minutes.

Please come back in 20 minutes, Mr Chan.

(11.34 am)

(A short adjournment)

(11.54 am)

MR KHAW: Okay, let's continue, Mr Chan. As an LP, I would like to ask -- you said you did not work in construction projects as an LP.

A. Yes.

Q. So I would like to ask you, did you encounter LPs where they had to sign WWO46 forms? Did you ever have to --

A. I have not dealt with those matters. I am aware but I never had to do that.

Q. So I would like to ask you, as an LP, if we look at the legislation, the current Waterworks Ordinance, it describes the responsibilities of an LP. Let's take a look at G1, page 229.

A. Okay.

Q. The Ordinance says, if we look at clause 15(1), that nobody can amend, change or alter the fire service "other than a licensed plumber or a public officer authorised by the Water Authority".

So it seems that the LP has the authority to do this

type of work.

Now, the Water Authority -- any repairs to a fire service or any changing of a tap "may be carried out by a person other than a licensed plumber or a public officer authorised by the Water Authority". So, if there is any contravention, it's a breach of the law.

So you are aware of that, what an LP can do and not do; you are aware?

A. Yes.

Q. Let's take a look at another document before I follow up. If you look at C3, page 2422. If you are not familiar with this document, I will go through it with you. It's a circular by the Waterworks Department, 4 September 1990. It says:

"(In English) There have been instance where licensed plumbers withdraw from the plumbing work of a project and ask other person to take over the work without notifying the Water Authority."

So the LP does not participate directly, and they also did not notify the Water Authority.

It says:

"(In English) I like to remind you that you should not hand over the plumbing work for which you have signed Waterworks Form G to any other person so as deem to transfer the responsibility for supervising the work

unless the person to take over is himself a licensed plumber and has obtained the approval of the Water Authority through submission of a fresh Waterworks Form G.

So long as you remain to be the licensed plumber of a particular job for which you have signed Waterworks Form G, you may employ workers who are not necessarily licensed plumbers to assist you in carrying out the work. But under no circumstances should you use your licence to enable non-licensed persons to undertake plumbing work without involving yourself in the supervision of the work."

So it reminds the LPs that regarding projects, you can employ people to do the work, but you still need to monitor the work.

So I would like to ask you, as an LP, the work scope of an LP, except for minor works, the hands-on work -- do you do hands-on work or do you just monitor the engineering works?

A. The licensed plumbers can be engaged in hands-on work, but some companies would also employ LPs to follow up on projects. That is to say, the LPs may be responsible for supervision and management. But for smaller companies, the boss himself may be an LP.

Q. So both situations exist?

A. Right.

Q. To your knowledge, in relation to the work of an LP, as the person overseeing waterworks, what usually would an LP do on a site?

A. Usually, in a project, as an LP, say if it's a small project, then the LP would be in charge of everything, such as submitting forms to the WSD, procuring materials, the hands-on work or supervising his workers. But for a bigger company, an LP may be employed to manage the project. He may not work hands-on, but he may oversee the workers' progress and when forms should be submitted, when reports should be made, when water tests should be carried out. As an LP, he is responsible for the project.

So, in short, all plumbing-related works should be under his charge in the project.

Q. Let's go back to your witness statement. I have a number of points to clarify.

In W1, page 737, paragraph 9, you talk about different TLPs in annexures 1, 2 and 3. I would like to take you to the TLPs and I would like to clarify the year.

For annexure 1, the TLP is in relation to different metals, alloys and plastic materials.

Let's turn to page 745. This is a 2004 course TLP;

is that right?

A. Part of it is 2004. For the one annexed to my statement, the notes have been updated, I mean part of the TLP has been updated. For example, on soldering -- let me check. Soldering is on page 790, and you can see that we have updated the content, following the circulars issued by the WSD in 2015, and we follow closely the WSD's latest requirements.

We can see that the notes now differ from the previous versions.

Q. You also have annexure 2, which starts at page 750. I understand that this TLP was also updated in 2015, because starting from page 758, when it talks about the British Standards -- and let's say, if we turn to page 760, you can see that for the British Standards cited, it's 2015, some of them are 2015. So this is the most updated version?

A. That's right, because for all these course notes, they have been updated very recently.

Q. As you understand previously, there wasn't a table in the TLP showing the different BS?

A. Correct.

Q. If we turn to paragraphs 11 and 12 of your witness statement on page 738, here in paragraph 11:

"(In English) The topics on soldering are set out in

the syllabi of (i) module entitled 'Pipework installation' at page 38 and (ii) module entitled 'Plumbing practice I(A)' at page 46 of the 2004 course scheme. I confirm that I have taught the students about soldering and soldering materials and enclose copies of the relevant TLP distributed to the students during the course as annexure 4 for the ease of reference of the COI."

So if we turn to annexure 4, which is on page 789, this is the distribution of TLP updated after 2015.

Yesterday, I asked Mr Lo this question. If we look at the course notes before the updated version in 2015, say for course 266 and 268, in relation to the lead-free requirement for soldering materials, there wasn't any particular notes.

A. For 266 and 268, there wasn't any emphasis on the soldering materials being lead-free. But for plumbing works, usually metals would be taught in the basic course, the common metals being tin and copper and lead, and the characteristics would be taught.

Q. So the characteristics of these metals and different types of soldering materials?

A. Yes.

Q. But no particular mentioning of the soldering materials being lead-free?

A. That's our impression from the papers. If you talk about the previous versions of notes for 266 and 268, in fact for the TLP, it didn't appear until 2011. Before that, usually notes were prepared by way of handwritten notes, because teachers would only write on a blackboard.

CHAIRMAN: So you meant to say that these were also taught back then?

A. I suppose soldering materials would also be covered. I don't know, however, whether there would be any emphasis on it, because it's been 30 years. But students would be taught that some metals were toxic; lead would be toxic, for example. So if we use leaded soldering materials -- it shouldn't be used for fresh water supply.

CHAIRMAN: So at that time it wasn't expressly written, as it is in the TLP now?

A. But teachers should have taught students back then.

CHAIRMAN: In paragraph 4, you mentioned that you joined VTC in 2001 as an instructor. So you taught students at the workshops the hands-on skills in pipe installation?

A. In 2001, I was an instructor and I was in the Building Services Department. I taught about iron pipes, copper -- I mean plumbing and fire services.

CHAIRMAN: So did you teach students about pipe jointing in

plumbing?

A. Yes.

CHAIRMAN: You talked about different methods of jointing pipes, one of which is soldering?

A. Right.

CHAIRMAN: When you were an instructor, perhaps in the syllabus it wasn't, as mentioned by Mr Khaw, expressly provided, but according to what we heard from you, for practical instructions, definitely students would be taught. So did you teach them?

A. Yes.

CHAIRMAN: Teach them what?

A. On the selection of soldering materials, because then we knew that for fresh water supply, materials, pipes, soldering materials should be lead-free.

CHAIRMAN: So even in 2001, you would have been teaching students that?

A. Right.

MR KHAW: So starting from 2001, you began teaching students --

CHAIRMAN: Him?

MR KHAW: -- you yourself began teaching students about soldering materials. As for the two relevant courses, 266 and 268, does it begin until 2006?

A. For 266 and 268 -- I mean in 2006 it was 55776 and

53776.

Q. Previously, they were the predecessors of 266 and 268?

A. Yes.

Q. So you became an instructor in 2001?

A. Yes.

Q. You taught students about the soldering materials used in pipe installation?

A. Yes.

Q. Did you personally demonstrate jointing of pipes?

A. Yes.

Q. When you made the demonstration, which type of copper pipes would be used? Copper pipes, I mean the method of jointing: compression jointing, soldering.

A. I needed to teach all methods.

Q. So you demonstrated every method?

A. Yes.

Q. So, when you demonstrated soldering, what soldering materials were used?

A. Well, at that time, we were using solder rings, but in fact before we made the demonstration, it was easy to buy leaded solder strips, in hardware stores, electronics stores. We were able to buy lead-free solder wire, but not as easy as buying leaded soldering materials. So we would show them both, one being lead-free in a roll and the other being leaded, and we

would tell students matters to note, and the relevant knowledge, before proceeding with demonstration.

Q. You said you demonstrated with solder rings, that is a component with soldering materials inside, and when you demonstrated with solder elbows, at that time you had already shown different soldering materials to your students?

A. Right.

Q. And you told the students that one was lead-free, the other was not, and did they come in the same shape and form?

A. Both were in reels.

Q. So can we tell from the appearance, say the brand or label or colour, the difference between the two?

A. Well, usually, when teaching students, we would not mention the brands. Usually, we would tell students to distinguish by its colour.

Q. So you mean the colour of the soldering materials?

A. Yes, the colour of lead-free soldering materials and the leaded one.

Q. When you hold these two reels in hand, can you already tell from its packaging the difference in the colour of the two?

A. The packaging colour -- we would seldom look at the packaging colour, because each manufacturer or each

supplier may have different packaging. Usually, we would read the label, because there would be a label attached to the roll.

Q. Did you ever explain the contents of the labels to students?

A. Yes.

Q. So, when you had these two types of soldering material, how did you describe them?

A. We would have to emphasise some material was for pipes, some would be for electronics, and we would say that it would be lead-free. We would have to tell them -- even though I was teaching in a workshop, I would have to teach them theory, that lead is harmful to the human body.

So it's not just in the fresh water supply system. For example, you might have metal gates at home, you have to use a lubricant; these lubricants might contain lead. So we would have to tell them, after touching that, you have to wash your hands, because if you eat afterwards, you might consume the lead inadvertently.

So we would explain in general terms, to enhance their understanding.

Q. I would like to ask you, at the time when you explained the differences between the materials, their characteristics, as an instructor did you feel that this

topic was an important subject that deserved detailed explanation?

A. Yes, of course it's important.

Q. So, aside from oral description, did you provide course material, written material, such that they would have a deeper understanding?

A. Well, we didn't have extra material, but a lot of times some students, they might have a more sincere drive for seeking knowledge and we would refer them to the British Standards, or we would tell them to attend other lectures or seminars. We would tell them to further their studies.

Q. I know, when you say British Standards, you didn't compile a table, so students would have to do their own studies and look into British Standards; is that correct?

A. Yes.

Q. Just now you said there are two types of material. There is a difference in outward appearance -- you can tell which is lead-free and which is leaded. Could you tell us, how did you teach students to differentiate between the two?

A. Well, if you have done some plumbing works, lead-free solder, you can see it's shiny, but if it's leaded, it's dull.

Q. Let's take a look at some actual physical samples. Let me show you. (Handed).

Can you tell us how to differentiate from outward appearance whether it's lead-free or not?

A. Well, when we have leaded solder, some might contain more lead, some might contain less lead. So if it has more lead, it's easy to differentiate. Here, now, it's rather difficult. So when we taught students -- electronics solder contains more lead, it is easier to differentiate.

Q. The one in your right hand we know is 50 per cent lead, so is that a lot of lead or not a lot of lead? In your right hand.

A. If it's 50 per cent, that's a lot of lead.

Q. So, if it contains a lot of lead, how can you tell visually whether it has lead or not?

A. Well, if it has lead, it oxidises quicker. It will become dull. But if you have something brand new, it might be difficult to tell.

Q. So, just from visual inspection, it's not that easy to differentiate visually which has lead or not?

A. You can put it that way.

Q. Aside from outward appearance, how can students tell what material has lead in it or not?

A. Well, at the time, we would have to rely on the label,

the packaging. Ever since the excess lead in water incident, we now have test solutions and testing methods, and now it has improved.

Q. So back then, aside from visual inspection, but that was not very accurate, you had also explained that they should read the labels.

Then I would like to clarify the chronology with you. You said that you did demonstrations -- or when you joined the VTC, you served as an instructor. Then, in 2006, you had also taught the three-year courses.

A. Yes.

Q. So I would like to ask you, regarding the three-year course, when you were an instructor, in this regard did you teach the soldering or jointing of copper pipes, and did you do demonstrations?

A. Well, in 2006, I was responsible for the night course, 55776. I was responsible for the workshop. I did do demonstrations. In 2001, I was responsible for teaching the 53776 theory course. I didn't do demonstrations.

Q. So, in the nighttime course, you had done similar demonstrations. At the time, were you working with the elbow joints that contain solder, or did you have to apply external solder? You did both?

A. Yes.

Q. And it is the same. Was there any difference in 2001?

A. Well, the skill demonstration was the same.

Q. In instructing leaded material or lead-free material, was there any difference in 2001?

A. It was the same.

Q. Can you confirm that in 2006, the nighttime course, when you did demonstration or when you taught the theory, you had given a special instruction regarding leaded material or lead-free material and you did demonstrate the two materials?

A. Yes.

Q. Then I would like to ask, in the nighttime course, I have read the curriculum, and when you do the demonstration, do you -- since there are a lot of sections in the plumbing course, so in the soldering section, you do a demonstration?

A. Well, in our semester, in practical 1B, we see copper joint, copper tube -- we demonstration compression joints and soldering. That's the first year.

Q. In your witness statement, W1, page 738, it says:

"(In English) I refer to paragraph 46 of Mr Lo's witness statement and I confirm that although the TLP prior to July 2015 has not been amended to reflect the availability of various types of soldering materials in the market, I have taught the students to use lead-free solder for fresh water plumbing system during the class

since I started teaching the course. On top of the teaching notes, I have adopted a video produced by the Copper Development Centre in my teaching. A copy of the video is attached ... It is clearly stated in the video that lead-free should be used for potable water system ..."

And we have seen that video.

"(In English) Soldering materials with lead can be used for other purposes such as soldering for electrical wiring or sewage pipes."

I would like to follow up with you. This is not your personal demonstration. You said you had played some videos for your students. So I want to know that in 2006, when you started the nighttime course, these videos, would you conduct it at the same time as your demonstration or would you separate the two events?

A. Well, in 2006, we didn't have the video. The videos started in 2010.

Q. In 2010, did you do personal demonstrations regarding the jointing of copper pipes?

A. I did that in the nighttime course, because it was a workshop and the instructor would have to demonstrate once for the students. But for the daytime course, 53776, we played the video and shared experience.

Q. So nighttime course, you did a demonstration but there

were no videos?

A. Well, in 2006 to 2009, there was demonstration and no video. In 2010 until now, at the nighttime course, we have a video and a demonstration. The daytime course has the video plus my lecture.

Q. So after 2010, the only difference is the night course has a demonstration and video, and during the day there is no demonstration but there is a video and lecture?

A. Because the daytime is in a classroom. It is not that convenient to do a demonstration with a torch.

Q. So for night class you play a video, you do a demonstration; you can do it at the same time?

A. Well, in general, in the first class, in the night class, we would talk about safety issues, when you are using a torch, and so on, you need to go through the safety measures, and we show them a video first. Then we would tell them -- in the next class we would teach certain material. In the first class we would go to the workshop. It's like a classroom setting; we can play videos. Then we can go to the workshop. We will do a demonstration, and so on.

Q. So, for the night class, you play the video first.

A. Yes.

Q. And then you do a demonstration, not necessarily the same day?

A. There is a possibility of doing it in the same day, because if you play the video, we might have leftover time. We won't waste the time. You need to demonstrate, and then have them try it out themselves.

Q. So, when you play the video, after showing the video, you will give them a lecture; you would summarise it for them?

A. I would give them a comprehensive talk.

Q. Did you mention what type of solder material? Would you repeat?

A. The video says that for potable water you have to use lead-free solder, but you know, students might horse around and they might not pay attention. We understand, so we will repeat it again, and even midway during a demonstration we would repeat the mantra. We would also emphasise that in the demonstration.

Q. When you said you would show the students leaded material and lead-free material, so during your lecture did you mention British Standards?

A. Yes. In the workshop we mentioned it. In the classroom, we would give a more detailed talk.

Q. Have you heard that large diameter copper pipes need to be jointed by lead-free solder wire, and the small diameter copper pipes, they will use solder strips for soldering? Have you heard of doing that?

A. No.

CHAIRMAN: Leaded solder.

MR KHAW: Leaded solder.

A. So large diameter, you have to use lead-free; for small diameter, you have to use leaded solder?

MR KHAW: Yes, have you heard of that?

A. No, I never heard of that.

Q. So as far as you know, leaded and lead-free, the melting point, what's the difference?

A. For lead-free one, it's about 232 degrees. For leaded one, sometimes the melting point is lower, depending on the lead ingredient.

Q. We heard from the CIC instructors that for leaded materials, the viscosity is higher. For lead-free, it's less viscous.

A. I don't agree, because in terms of viscosity, when you place a torch against it -- well, I don't know. It depends on the strength of the torch, and I don't know how to define that. I'm not sure what it means, but let's say if the torch is stronger, then it means it's hotter, and on the contrary, if the torch is less strong, the melting process may be less thorough.

Q. Let's turn to page 563. You explained to us just now that for lead-free soldering material, the melting point is higher; for leaded material, it's lower.

CHAIRMAN: It depends on the lead content. You can only determine the melting point by how much lead is in it, so you cannot make it a general rule.

MR KHAW: So, for soldering materials with lead, then if we look at page 563, for the soldering material with a lower percentage of lead, you can see that the melting point is lower.

CHAIRMAN: So you can only compare apples with apples but not apples with oranges, because from the testimonies heard, sometimes they have been comparing apples with oranges.

MR KHAW: Generally speaking, for leaded materials, usually it is the case that the higher the lead content, the higher the melting point?

A. Let me put it this way. Usually, the soldering materials contain not only lead but other metals. You need to look at the content.

CHAIRMAN: If we talk about the main content of soldering materials being tin and lead, then it is the case that the higher the lead content, the higher the melting point.

Just focus on lead and tin, because for soldering materials you can use other metals.

MR KHAW: Have you heard of the lead-free soldering materials called high-temperature solder wire?

A. No.

CHAIRMAN: How about high-temperature solder strips, I mean the lead-free one?

A. No. For lead-free solder wire or solder strips -- I mean, there is a melting point for that metal. I haven't heard this.

MR KHAW: I have no other questions. Thank you.

Cross-examination by MR YIN

MR YIN: Mr Chan, I have some questions for you. You do have some knowledge on jointing pipes by soldering with soldering materials?

A. Right.

Q. Basically, the theory is that you apply filler metals which has a lower melting point than the pipes to be connected.

A. Of course.

Q. Then you connect the two pieces of metal.

A. Yes.

Q. We understand that different soldering materials could be applied in this technology or in this skill, but the watershed is normally 450 degrees. For soldering materials with a temperature lower than 450, it's usually called soft solder. For materials higher than that temperature, it's usually called brazing or hard solder.

For brazing, that is with a high melting point, basically it's silver brazing, but it could also be copper brazing and brazing involving other metals.

But regardless of which solder materials are used, usually, let's say for connecting copper pipes, the larger the diameter of the pipe, the ability to withstand pressure would be lower. That is, for the same type of material, the larger the diameter, the lower the capability to withstand pressure at the joints?

A. Usually, for the same material, applied to smaller diameter or larger diameter pipes, the ability to withstand pressure is more or less the same.

Q. I ask this question because I can refer you to the British Standard -- in fact, it's the European standard. BS EN 1254, in bundle B15.4, page 40193, there is a table 6. BS EN, as I understand, that's British Standard 864. This is an updated version.

Because BS 864, as we understand, at the time when the UK joined the European Union, it became BS EN 1254. Basically this table sets out different working temperatures for different soldering materials, and the pressure rating for pipes of different diameters.

I can walk you through the table. The first category, leaded soldering materials, 50/50 or 60/40, at

a temperature of 30 degrees Celsius. Then, for 6 millimetres up to and including 34 millimetres, then the maximum pressure could be 16 bar. Then over 34 mm to 54, again the pressure rating 16 bar. However, for 64 to 108 mm, the pressure rating drops to 10 bar. Then, at 65 degrees Celsius, for diameters from 6 to 34, then the pressure is 10 bar. 34 to 54, 10 bar. Then above that, just 6 bars. The higher temperature, 110 degrees, the performance is even worse, from 6 millimetres to 34, and then to 54, just 6 bars, and then above 54, just 4 bars.

Then two other types, type 2 and type 3. In Roman letters you can see tin/silver and tin/copper soldering materials, a combination of tin and silver or a combination of tin and copper, these two types of alloys.

Then, at 30 degrees Celsius, the pressure rating from 6 mm to 34 mm and 34 mm to 54 mm, 25 bars. Then, above 54, just 16 bars. At 65 degrees, for diameters from 6 mm to 34 mm, 24 bars; and then above 34 mm to 54 mm, 16 bars.

Then above 54 mm all the way to 108 mm, just 16 bars. Then even higher temperature of 110 degrees, for diameters from 6 mm to 34 mm, the pressure 16 bars; above 34 mm, just 10 bars.

Can you see that?

A. Yes.

Q. Then the second row, brazing, involving different types of soldering materials: silver brazing, silver/copper, silver with cadmium, and then copper and phosphorus. Again it sets out a different working temperature and the relative pressure rating.

A. Yes.

Q. Basically, it's the same as the second category, that is leaded and lead-free soldering.

A. Yes.

Q. That's the same for diameters 6 mm to 34 mm, the pressure rating is 25 bars, which is the same as lead-free soldering materials from 34 to 54 mm; again, 25 bars. Above 54 mm, 16 bars. And also the same set of figures at 65 degrees Celsius.

So, basically, lead-free soldering materials have the set of same figures as silver brazing?

A. Of course, there are justifications for these figures in the table, but as far as plumbing is concerned, pressure and temperature affect directly which jointing method should be adopted and soldering materials to be used.

Say for domestic units, not a centralised system with a lower water pressure, soldering would be used. For a central system with higher temperature and higher

pressure, say in a hotel or hospital, usually, in a centralised system, larger diameters would be used, with higher water pressure. So usually we would go for silver brazing or copper brazing.

MR YIN: But is it right to say that for substance flowing through the pipes, that's normally water or other substances?

A. Yes.

Q. Then the diameters of the pipes to be connected would also affect the pressure. That is to say, for the same type of soldering materials, the larger the diameter of the pipe and the higher the temperature, the lower the pressure rating?

A. That's definitely the case, because you can see they have different melting points. They have different melting points for silver brazing and soldering materials. That's the same for pressure.

If you look at the table, you can see even for the diameter of pipes, there is an impact.

Q. If we just look at the table, we can see for lead-free soldering materials applied to pipes below 108 mm diameter -- that's about 4 inches.

A. 108 millimetres, about 4 inches.

Q. Of course there are pipes of larger diameters, but for 4-inch diameter pipes, if we use soldering materials

with lead, then the pressure rating is much worse than silver brazing.

Please refer to the table.

CHAIRMAN: I would like to ask first. The Housing Department, they also require silver brazing for large diameter. So, in the Housing Department's specifications, why do they not use lead-free?

MR YIN: Because lead-free performance is lower. But for smaller diameter, basically, if it just carries water, there is no difference for 100 degree water.

CHAIRMAN: It can only go to 100 degrees for water.

MR YIN: So if we say there is no difference for 110 degrees, then it means no difference. That's the point I would like to highlight.

CHAIRMAN: It's very simple. He's just saying one thing. We have heard that private developers, even though the diameter is small, they would still use silver brazing. The evidence we have heard is that silver brazing provides a more solid connection; is that correct?

Mr Yin is saying that the Housing Department, they had listed three types, and contractors could choose amongst those three choices. They did not specify that you have to use silver brazing.

MR YIN: Except for large diameter.

CHAIRMAN: So he means -- he wants to tell you -- from the

table, we can see there's no difference whether you use lead-free or silver brazing for small diameter. So since there's no different, they allow you to make your own choice. But we know that in private buildings, they all use silver brazing? Well, not all, but a lot use silver brazing, because the workers say -- if you look at the table, there's no difference, but in fact silver brazing provides a solid joint.

What do you say from your experience?

A. I would like to share my experience. Solder and silver or copper brazing, you will find the melting points are different, and in general the pressure they can withstand is different.

CHAIRMAN: The pressure they can stand?

A. For residential units, it won't be very high pressure. It's only about 3 bars. So you will see, in residential units even for private buildings, they would also use solder. But if you use silver brazing, it's a more solid joint. You also see that there are differences in cost for silver brazing; it's more expensive. And you cannot use an LPG torch; you have to use an oxyacetylene torch for silver brazing.

Of course, if your building quality is better, then you could also have gold-plated faucets. It depends what you want.

As a plumber, you should be able to determine when to use solder. Of course, you need to fulfil the system requirements.

CHAIRMAN: Just looking at the table, this is whether it's gas or fluid, pressure in the pipe. In private buildings -- all the Housing Department building pipes are exposed, but in private buildings, they are all inlaid, and if you cover them with concrete, when you lay concrete, there is weight, pressure. But when it's an external pipe, there's no pressure. We also hear that after you apply pressure, there is some vibration; they have to dispel the air bubbles. So is that the reason?

A. The pipe -- it has to sustain the internal pressure. If you have cement outside, it's already stable. But your system, as I said just now, for residential units, you won't have high pressure, but for hotels, hospitals or special uses, they might have a higher internal pressure.

Of course, some plumbers, they worry that if pressure is low, if you can use solder, silver brazing, it's not a big difference. But when you have high temperatures, high pressures, if you use solder, the joint might be as solid.

CHAIRMAN: It might leak, the pipes might burst?

A. Yes.

MR YIN: I would like to ask one more question. Just now you said that as a plumber you should be able to judge under what circumstances which solder material to use, because you would be able to determine how much pressure the joint can sustain under a certain temperature and pressure. The diameter of the pipe also affects the ability to withstand pressure; is that correct?

A. There should be some general knowledge.

Q. I would like to follow up on Mr Khaw's question. We have heard some plumbers say that for small pipes, they would use leaded solder, and for large diameter pipes they would use lead-free solder.

But referring to the table, we see leaded solder. When you apply it to large diameter pipe, it doesn't quite withstand pressure.

CHAIRMAN: So you are saying it's illogical?

MR YIN: No, it's logical. They know that they can't withstand pressure, so they want to use lead-free solder for large diameter pipes.

CHAIRMAN: Okay.

MR YIN: So the plumber knows that when they have a large pipe, leaded solder won't stand the pressure. So for small pipes they will use leaded solder, but for large pipes they will use lead-free solder, because the leaded

solder can't stand the pressure?

A. I don't think that is the case. A lot of times, in the industry, the technicians, when they choose solder or silver brazing, it depends. In general, my understanding is that they won't look into the details of whether it's leaded or lead-free and how much pressure it can withstand. They should know that solder and silver brazing, copper brazing, the ability to withstand pressure is different.

CHAIRMAN: Anybody else with questions?

Okay. Thank you, Mr Chan, for attending.

Further cross-examination by MR KHAW

MR KHAW: I don't understand and I would like to ask one more time -- page 563 of W1. I had asked you a question about melting point. I would like to understand -- we see three components, three materials: A, B, C. When I asked the question, we had grade A, it has 34 per cent lead, B at 48 per cent, and C at 68 per cent lead.

If we just look at these three materials, the more lead there is, the higher the melting point; is that correct?

A. Yes.

Q. If we look at tin content, the less tin there is, the higher the melting point?

A. We see that lead has a higher melting point than tin.

So when you add that, when you have alloys, there's also other, antimony. So if you look at these, if you compare these three, 30 per cent lead, 65 per cent tin, under this temperature -- 30 per cent tin for this material, it has a higher melting point, and for 65 per cent, it has a lower temperature.

Q. Well, if we talk about lead-free solder, in B15.1, page 37823, it has a composition of lead-free -- it's a test report for lead-free solder.

If we look at it, we have 99.15 per cent of tin, 0.85 per cent of copper, and this is lead-free.

So I want to understand -- we know that the melting point is more than the three materials we talked about just now. It's about 200-plus.

CHAIRMAN: 230.

MR KHAW: It's about 230 degrees Celsius, the melting point.

A. Yes.

Q. So, regarding the melting point, is there any relationship to lead content?

A. You see the tin content is 99.15 per cent, and copper is also one material. It's just lead-free. So I don't see the melting point. You say it's 230 degrees. Usually, for pure tin, it's about 232 degrees. If you add other materials, it will affect the temperature. It depends how much you added.

Q. If we look at page 563 --

CHAIRMAN: What's the melting point for tin?

A. It's 232.

CHAIRMAN: And what about lead, what about the melting point for lead?

A. Lead is 420 degrees.

CHAIRMAN: Thank you.

MR KHAW: If we look at page 563 --

CHAIRMAN: Mr Khaw, that's different. One has copper. That affects -- you cannot make that comparison.

A. The melting point changes. (Chinese spoken).

CHAIRMAN: I said you cannot compare apples to oranges.

MR KHAW: Okay. Thank you.

CHAIRMAN: Okay. Thank you, Mr Chan.

Okay, let's break for lunch and continue in the afternoon.

(The witness withdrew)

(12.59 pm)

(The luncheon adjournment)

(2.31 pm)

MR NIP: Chairman, may I call Mr Leung Man.

MR LEUNG MAN (affirmed)

CHAIRMAN: Please be seated.

Examination-in-chief by MR NIP

MR NIP: Mr Leung, please turn to your witness statement.

You can see your signature on page 6.

A. Yes.

Q. Is that your signature?

A. Yes.

Q. Then also on page 7?

A. Yes.

Q. I am going to read out your statement:

"1. I, Leung Man, provide this witness statement in relation to the letter sent by the Commission of Inquiry dated 18 November 2015 to the construction and development department of IVE. This witness statement will respond to requests 6 to 11 in the letter.

2. VTC has authorised me to respond to requests 6 to 11 of the COI.

3. IVE is an institutional member of VTC.

4. I studied in the Morrison Hill Technical Institute, which is the former VTC, in 1973, and passed the WSD exam in 1977 as grade II licensed plumber. In 1992 I passed the exam course number 5267 of certificate in plumbing services (Hong Kong) and became a grade I licensed plumber.

5. I joined the VTC in 1987. I was workshop instructor 2, and in 2009 I was promoted to senior instructor. My responsibility includes providing practical training at the plumbing workshop of the IVE,

including pipe connection practical training.

6. In relation to two plumbing courses of IVE (that is craft certificate in plumbing and pipefitting) (course number: 53776/55776) and (certificate in plumbing (services Hong Kong)) (course number: 56767), I am the instructor and I am responsible for providing practical training and semi-skilled trade tests, including pipe connection. So I have knowledge and experience in training plumbers and testing them. If this statement contains information that does not come from my direct knowledge, I will state the knowledge of such information.

7. I understand that Mr Lo (the supervisor of Morrison Hill branch IVE) and Mr Chan Tze Kin (instructor of IVE Pokfulam branch) also responded to the COI's request by way of witness statements. I read these two witness statements signed on 23 December 2015. I believe the content to be true and correct.

8. In relation to area number 6 of the request: it refers to the fact that from the evidence currently available, the use of copper pipes gradually became popular around since 2002, particularly in the context of public housing developments. With extensive use of copper pipes, the method of soldering for the purpose of jointing pipes was also widely adopted. Please describe

whether COI and, if so, how the plumbing courses and programmes offered by VTC have made corresponding changes to cater for the popular use of copper pipes and fittings in the construction and installation of the fresh water plumbing system.

9. As far as I understand, the certificate in plumbing or the craft certificate in plumbing and pipefitting is a three-year part-time course. According to the VTC's website, the admission qualification is form 3 or equivalent qualification -- there is no need to have relevant experience in plumbing works -- with priority given to practitioners in the industry. The course content includes craft theory and practical training in plumbing, including practical plumbing, drawing, fresh and flush water supply, fire services and gas installation, building construction, hot water supply, quantity surveying and plumbing, information, technology, science, mathematics, drainage system, drawing and pipe installation. After I joined VTC in 1987, I began to teach relevant skills in the course, including pipe connection.

10. As for the certificate in plumbing services Hong Kong, it's a 39-hour short-term part-time certificate course for practising plumbers who are qualified to refresh their memories on the necessary

knowledge and trade test to meet the requirement for applying to become licensed plumbers. In this course, I will not teach the relevant waterworks knowledge. I will not demonstrate the skills for pipe connection. I would conduct trade test directly. Between 1999 and 2004 (that's around 2002) the trade test included jointing pipes for soldering. To put it more accurately, since 2001, the trade test has included pipe jointing by soldering.

11. After I joined VTC in 1987, in the craft certificate course, I would teach students the jointing skills in connecting different pipes by soldering, including the use of copper pipes and fittings. As for the changes in the plumbing course, please refer to paragraphs 43 to 52 of Mr Lo's witness statement.

12. Area number 7 of the request:

To confirm whether the students were or are taught different components and the composition thereof of the materials used in the construction and installation of the fresh water plumbing system.

13. I confirm that I have taught based on the course schemes provided or as mentioned in Mr Lo's witness statement. In the craft certificate course, students would be taught the theory on the use of different materials required in installing fresh water

systems, including metal alloys and plastics. Students could also, in the theory lesson, learn about different components required in the fresh water plumbing system and the materials (including different pipes such as GI pipes, copper pipes, PVC pipes and other components).

14. In the practical skills training, I would apply the soldering knowledge that students had acquired during theory lessons, including the components and materials required for soldering, and also illustrate the skills by physical objects, for students to learn more about the course content.

15. Area number 8 of the request:

To confirm whether soldering or soldering materials used in jointing of pipes for fresh water supply were or are covered by the courses run by the VTC during the material period, that is from 1969 until now, and whether students were or are taught the different types of brand names of solder materials available in the market, including materials which are lead-free and those which contain lead, and the differences in components and functions between solder wire and solder strips.

16. After I joined the VTC in 1987, in teaching the craft certificate in plumbing and pipefitting, I would teach students to joint pipes by soldering. Soldering

materials including the solder flux, the components for jointing and solder wire. In my demonstration, I would only use solder wire and not solder strips, because in the soldering process I was required to melt the solder materials and solder wire would be -- it would be easier to control solder wire than solder strips. However, functionally speaking, the two are the same, that is to apply the necessary soldering materials at the joints.

17. When I taught soldering, I would first introduce to students one kind of solder wire, which is leaded, and the other kind, which is lead-free, and explain the uses of the two (for example, leaded solder wire would normally be used on circuit boards, whereas for fresh water copper pipe connection, lead-free solder wire should be used, but I would not mention the brands of solder wire, to avoid being accused of promoting the brand of certain products). I would also remind students that all the materials for soldering must be lead-free. As I would not use solder strips in my teaching, I would not mention how solder strips were used.

20. Area 9 of the request:

To confirm whether I or the VTC was aware of the soldering material which is in the form of strips by the brand name 50D flat tin strips and provide a sample of

such material and describe the composition, particularly the lead content of such material.

21. I have never heard of a soldering material with the brand name of 50D flat tin strips. Therefore I have not used it in my teaching, so I am not in a position to provide a sample and describe its composition.

22. Area 10 of the request:

To confirm whether, during the material period, students were or are taught that plumbing materials, including solder, should be of a lead-free category and the risk of using plumbing materials which contain lead.

23. As mentioned in paragraph 18 above, in teaching students I would remind them that all materials for soldering must be lead-free. These include pipes, components, soldering materials, flux and solder wire. All these must be lead-free, because lead is harmful to human health.

24. Area 11 of the request:

To confirm whether during the material period students were or are taught the skill of soldering for the purpose of jointing copper pipes and, if so, describe the method of jointing pipes properly by soldering. Please provide a soft copy of a video as an exhibit to the witness statement.

25. As mentioned in paragraph 16 above, in the

craft certificate in plumbing and pipefitting course, I would teach the jointing of fresh water pipes by soldering, that is jointing copper pipes. The method is as follows:

(A) Components which contain lead, which contain solder, that is there is a solder ring inside which contains soldering material.

(1) The sleeve, the pipe would be put in a sleeve, to know the size required for soldering, and then the surface of the component and the pipes would be sanded down with sandpaper, to remove the oxidised material which may affect connection.

(2) For the area requiring soldering, on the surface of the pipe and component, flux would be applied to clean the surface and the inner lining of the component, to prevent them from being oxidised.

(3) The pipe would be fitted in the component, then an LPG torch would heat the portion containing soldering materials.

(4) Then the torch would be moved to the joint.

(5) When the silverish soldering material can be seen to be oozing out, that means the connection is successful and the torch will have to be removed.

(6/7) If the soldering materials cannot evenly spread on the joint, the torch will have to be applied

again to melt the soldering material.

(B) Soldering material (that is the elbow joint doesn't contain solder):

(1) You need to take the pipe and attach it to the elbow joint to determine the area that needs to be jointed. Since the surface of the pipe might be oxidised, so you need to sand it down.

(2) You need to apply flux to the surface of the tube and the inner part of the joint; that is, to prevent the surfaces from oxidising.

(3) Attach the pipe into the elbow joint.

(4) Because the joint doesn't contain solder, so we need to apply external solder to the joint, and we also need to use lead-free solder wire.

(5) We apply the LPG torch and heat the area. We apply the solder to the joint. As long as the temperature is sufficient, the solder will melt.

(6) When the solder has melted, we can further apply heat until the whole joint is covered by solder, that is the silver material. If that was successful, you can remove the torch.

(7) If there's insufficient solder, we can add more solder.

(8) The last step is to clean the joint with a wet towel.

26. In accordance with the Commission's request, I have recorded three videos for your reference and they are attached as attachment 1."

We have read out your witness statement. Is that accurate? Do you wish to adopt this as your evidence?

A. Yes.

Q. That is your evidence?

A. Okay.

MR NIP: I have no further questions.

CHAIRMAN: Mr Khaw?

Cross-examination by MR KHAW

MR KHAW: First of all, Mr Leung, I would like to confirm some background information. I see in your witness statement you mentioned a few areas and I would like to clarify with you.

In paragraph 4, it says, in 1973, you had studied at the Morrison Hill Technical Institute -- that's the precursor of the VTC -- and in 1977 you passed the Water Supplies Department trade test.

A. Yes.

Q. If you look at the time frame, you studied at the VTC in 1973, so was that the plumber licence course?

A. It was called the installation course.

Q. It was a three-year course?

A. Yes.

Q. After completing the course, you took the Water Services test?

A. Yes.

Q. Then, at the time, before taking the Water Supplies test, prior to the test, did Water Supplies provide the test curriculum?

A. No.

Q. Did they issue any course material, information, regarding the exam?

A. No.

Q. At the time, to prepare for this test, how would you conduct your preparation?

A. We had some senior colleagues who had taken the test, and we would talk about and ask what the examination would include.

Q. You would ask your seniors?

A. Yes.

Q. When we asked Mr Chan, he had also taken the test and he said that there was a written component and also an interview. Was that the same with you?

A. Yes.

Q. Regarding the written test, did they test about legislation?

A. Well, there was a line diagram.

Q. There was a diagram?

A. Yes.

Q. Did they test you about water supply system, components, materials, specifications? Was that tested?

A. That was asked in the interview.

Q. This type of information, in the interview, they asked you about materials, and so on -- how did you learn that material?

A. Well, we had lectures, and we went through an apprentice system. There were some instructors at the company. So we learnt that.

Q. So the instructors you are referring to --

A. (Chinese spoken) --

CHAIRMAN: Hang on. So at that time you were in the company as an apprentice. The company sent you to Morrison Hill Institute?

A. Yes.

MR KHAW: So, prior to this task, you were an apprentice and you had acquired this knowledge, and they had talked about materials and components, specifications?

A. Yes, yes.

Q. It's been quite a while. You might not recall all the details. But I'd like to ask you -- we are talking about copper pipes, components, solder material, the standards they need to comply with. So at that time did you learn about that?

A. Yes.

Q. So what was your knowledge back then?

A. Well, in our area, we use compression joints, and we also had elbow joints, and we didn't have to apply external solder at that time.

Q. So you had compression joints and elbow joints that contained solder. So, when you took the grade II level Water Supplies test, you weren't too familiar with the soldering?

A. No. There was training at the company. We had to do that.

Q. But regarding materials, did you have knowledge about that?

A. Yes. We had acquired that theoretical knowledge.

CHAIRMAN: What was the company?

A. The gas company.

MR KHAW: So the first time you heard about soldering and they had to use lead-free solder, when was that?

A. I'm not sure. It should have been in a lecture, an instructor talked about that, and in the company, some instructors had also told us that we need to use lead-free solder.

Q. That was before taking the course, at the company?

A. The same time, concurrently.

Q. So when you took the Water Supplies test and you were

a grade II plumber -- at that time, there was a grade I/grade II regime. So was there a choice? Could you choose to take grade I or grade II, or were you awarded the grade according to your marks?

A. It wasn't according to marks. I chose either grade I or grade II exam.

Q. So in 1977 you acquired your grade II plumber licence, and in 1992 you had also passed another course. I would like to know, from 1977 to 1992, what work did you endeavour?

A. Well, I was in the gas company. I was doing pipe jointing. At that time, there were a lot of installation works; aside from gas stoves, there were also copper tubes for cold/hot water supply.

Q. And you were working in the gas company?

A. Yes, during that time.

CHAIRMAN: For the gas company, hot water/cold water supply, they use copper tubes, and gas pipes?

A. They use steel pipes.

MR KHAW: Okay. So you served at the gas company until 1992?

A. No. It was not in 1992. 1987. I joined VTC in 1987.

Q. That is correct. Okay. In 1987 you joined VTC. I would like to ask: had you ever worked as a licensed plumber in construction projects?

A. No.

Q. So in 1987 you joined VTC, and I see in your background info you had taught the craft certificate and you were also responsible for course 5267, and then the course was changed to 56767, and you had taught -- and the short course, 56767, you were responsible for the skills test.

I would like to talk about the skill course. If you refer to paragraph 11 of your witness statement, it says here that you joined VTC in 1987, and you taught the comprehensive plumbing certificate course, and students would learn how to use soldering to connect different types of pipes, and that included copper pipes and copper components.

Regarding a change in the course curriculum, I need to ask you to refer to Mr Lo's statement.

If we look at the craft certificate course curriculum, they do talk about soldering, so let me direct you to page 64.

This is a curriculum from 1996. We have the course outline. So, when you taught that course, it says here that you talked about soldering and soldering methods. So the course material is in English. When you taught the material, did you have your own set of teaching material?

A. I would teach -- I would go through the material orally. I teach it verbally.

Q. So, when you understood the course material, did you have to refer to the English material?

A. Yes.

Q. So if we look at the content on page 67, in B we cover soldering. It talks about the procedures of soldering.

A. (Nodded head).

Q. Moving on to page 82, in 1.9, it says:

"(In English) Compares the advantages and disadvantages of different pipe materials stated in 1.8."

At that time, when you taught this material, if we talk about jointing pipes, there are different methods. Yesterday, we saw some videos, demonstrations. It included elbow joints that contain solder, and applying external solder.

So, regarding the different soldering methods, did you talk about the pros and cons? So you talked, compression joints, and what else?

A. For example, if you have gas pipes, how to solder gas pipes.

Q. You also talked about soldering?

A. Yes.

Q. So, when you were an apprentice, your mentors, when they

talked about compression joints and soldering, and when you taught this material to the students, the pros and cons, would you talk about that?

A. Yes.

Q. So your knowledge of these two methods, what do you think are the pros and cons?

A. For compression jointing, because the compression ring is relied on to withstand pressure, for an inlaid pipe -- because at that time, usually the pipes would be on the external walls. If it's inlaid, it can save space. Basically, the soldering joints would be the same as compression joints.

Q. In terms of withstanding pressure, water seepage, which one would you prefer, compression joints or soldering?

A. No difference.

Q. Let's turn to page 859, paragraph 19. In paragraph 16 you said that in 1987, after you joined VTC, when you taught the craft certificate course, you would teach students to joint pipes by soldering, and the materials required included copper pipes, flux, components for connection and solder wire. In your teaching, you would only use solder wire as teaching material. You would not use solder strips because soldering materials would have to be melted in the soldering process and it was easier to control solder wire than solder strips.

A question: when you taught the craft certificate course in plumbing and pipefitting, when you talked about soldering, first of all you would teach the theory, show them the materials, make a demonstration. So usually the lecturing and the demonstration would take place on the same day?

A. Yes.

Q. Usually, in a three-year course, when will this be done?

A. Basically, in the second year, I would be teaching the students. In the first year, other instructors taught them.

Q. So basically the second year?

A. Yes.

Q. In a three-year course, apart from explaining to students the types of pipes, materials, and demonstrating to them soldering, but you also teach about other topics, other courses, teach about that in other courses?

A. In higher diploma courses, the students --

Q. I'm sorry, I'm talking about this course, this three-year course. In your statement, you said that, for example, you would teach students soldering and you would demonstrate soldering pipe connection by different methods. Apart from these topics, is there anything else you would tell students?

A. Yes. For example, copper pipes may be used in substitute of GI pipes and there are other ways of soldering, because for copper pipes it may not be used in water supply, it may also be used in gas supply or air-conditioning.

Q. So when you personally taught students about soldering, you would lecture and demonstrate. Would you show students some videos?

A. Basically, I would not. I would just demonstrate it personally.

Q. So, as a teaching material, you would show them solder wire. Is it solder wire in reels?

A. Yes.

Q. Is it something similar to this one, in this form, in green, in a reel? (Indicating).

A. Yes. Previously, I didn't use it, but it's also called lead-free solder wire.

Q. So in the same shape and form, but with different packaging?

A. Not this brand, right.

Q. You said that in your teaching, apart from using solder wire, you would also show students solder strips. You would tell students that these are the two types of soldering materials.

So, as far as you are concerned, when we talk about

solder used in soldering, what would you usually call it?

A. Soldering materials.

Q. What about this one in a reel? What would you call it?

A. Solder wire, lead-free solder wire.

Q. What about this one? (Indicating).

A. I haven't seen that before. I have seen some strips which were as thick as a bar.

Q. So you would first introduce the students one type, that is lead-free solder wire, and the other type, which is leaded.

Now, we understand that lead-free solder wire was something similar to this one. What about leaded?

A. It also came in a reel, only that the soldering materials contained lead.

Q. What about the composition? Would the composition be included in the label?

A. Yes.

Q. Is it the same brand?

A. No.

Q. About these solder strips, had you seen it before?

A. No.

Q. So regardless of whether it's leaded or lead-free, it's in the form of solder wire?

A. Right, but I have also seen solder bars which were very

thick, because in soldering we needed to melt the solder, in paragraph 16, and it was easier to control solder wire than solder strips.

So because high temperature was required, maybe we needed to use thinner wire, and then subsequently we used solder wire instead of solder strips.

Q. So when you said it was easier to control solder wire than solder strips, by "solder strips" you were actually referring to solder bars. How thick were they?

A. About as thick as a finger.

Q. What was its use?

A. Sometimes, when we use a rod, iron, zinc plating or zinc sheets.

Q. So, for you, you wouldn't use solder bars to joint copper pipes?

A. No.

Q. For solder wire, when you taught students, you would say that lead-free solder wire should be used for soldering, so you would also including the term "lead-free"; right?

A. Yes.

Q. We watched your video demonstration yesterday. It was very clear. So, for you, if you were using reels of solder wire for soldering pipes, you would hold the whole reel in hand?

A. Right.

Q. Would you cut solder wire into shorter segments?

A. Yes, it's possible.

Q. Under what circumstances would you hold it in hand in the whole reel?

A. For example, if I need to joint a pipe with larger diameter, I would hold it -- I would not cut it, because that would lead to more waste. If I held it in hand, then I could just use whatever was needed. But when I taught students, I would cut them into segments, because a student wouldn't use up a whole reel.

Q. So, when they practice, you would cut the solder wire into segments?

A. Right.

Q. You said you would show students lead-free and leaded solder wire. Did you tell students how to tell the two, how to tell the difference between the two? Did you tell them?

A. Yes. Basically, I was also taught about this. If it's pure solder, it's more shiny, but if it contains lead, then, because of oxidation, the colour would look dull. That's basically how we distinguish whether the material contained lead or not.

Q. This morning, we heard from Mr Chan that he would distinguish the two by way of its colour. However, after some time, perhaps because of oxidation, in terms

of its colour the difference may not be that great.

A. If left for some time, then the one with lead may have more serious oxidation.

Q. So, when you show students the leaded solder, do you remember the lead percentage?

A. I suppose 60/40.

Q. 60/40, right? Is it 60 per cent --

A. 60 per cent tin and 40 per cent lead.

Q. Country of origin, is it the same?

A. No.

Q. The leaded one, what's the origin? Do you remember? Is it another country?

A. Yes.

Q. Apart from telling the difference from the surface colour, would you also tell students whether there is any other pay to distinguish the two?

A. For a reel of solder wire, usually there would be a label, and we could tell from the label.

Q. But the label was in English. The label is written in English.

A. Yes.

Q. So what would you tell students?

A. Because the language proficiency may not be the same, say for 99C, it would mean that 99 per cent of tin and C means copper.

Q. So, at the time when you used solder wire, the label also bore "99C"?

A. Yes.

Q. You also use this one? (Indicating green reel).

A. Yes.

Q. When did you begin to use it?

A. I began to use it since about 2010.

Q. Did you tell students anything about British Standards?

A. Yes.

Q. Now, what was it about?

A. Say, for components with lead, the British Standards should be met. Usually, it would tell us whether it's 864 part 2, part C, et cetera.

Q. Have you ever heard of the procedure of applying solder to the inside of an elbow?

A. Yes.

Q. That's also one of the procedures in soldering?

A. No, no, not soldering. The term means applying soldering materials when -- melted soldering materials which contain lead to the connecting joints, and then you use a piece of cloth or gauze to spread it even.

Q. This was not elaborated in your video. We had seen other videos applying this technique. So this application of solder, if we have external solder to joint in, how would you determine when --

CHAIRMAN: We do not need to know about this.

MR KHAW: Have you heard that for large diameter copper pipes, we need to use lead-free solder; for small pipes, you have to use leaded solder? Have you heard of this?

A. No.

Q. I would also like to ask, when you apply external solder, the workmanship, the skill is quite important, how much solder needs to be applied, and so on. So, in your demonstration or lecture, did you emphasise this?

A. Yes.

Q. Could you elaborate what you taught?

A. When we apply solder to the joint, if it's leaded -- if it has tin, it would form a ring, and that is sufficient. So your solder wire needs to form a ring around the joint. When we contact the manufacturers, they tell us they cannot use all the solder. There would be some excess solder. You only need to use about 80 per cent of the solder.

Q. So you would tell your students not to apply too much solder to the joint?

A. Right.

MR KHAW: I have no other questions.

Questioning by THE COMMISSIONERS

CHAIRMAN: Mr Leung, I would like to ask you -- back to your Towngas days. We know that for fresh water supply, we

have to use lead-free solder.

Let's talk about public rental housing. In public rental housing, we have fresh water supply in the kitchen and washroom, basically. So, in the kitchen, we have fresh water supply. Now, in the washrooms, the water might go to the water heater, if they use a water heater. With that pipe, when it enters the water heater and when the hot water leaves the heater, are there different materials used?

A. Yes. Well, for gas heaters, we use compression joints. Soldering is not used that often.

CHAIRMAN: So the cold water uses compression joints?

A. Compression joint, and the hot water coming out also uses a compression joint.

CHAIRMAN: The hot water also uses compression joint. You don't use solder at all?

A. Right, we don't use solder.

CHAIRMAN: Any particular reason for that?

A. Well, at the time, the compression joint was popular, in my time.

CHAIRMAN: When you were at Towngas. Okay.

So, back to the present day, is there any difference?

A. No. No difference, basically. We have to be careful though, because the hot water is connected to the fresh

water supply, so it should still be lead-free solder.

CHAIRMAN: So, in other words, whether it's the kitchen or the washroom, basically the whole water supply system would have to use lead-free solder. So, in other words, a public rental housing unit -- actually, there is no installation that requires leaded material to do soldering; can I put it that way?

A. Well, with aircon --

CHAIRMAN: No, wait a second, sorry. It's gas. What solder material do they use?

A. We have valves, not copper tubes. Unless we have built-in elbows, we would use compression joints or rubber hoses.

CHAIRMAN: So you might use copper tubes for gas.

A. Yes.

CHAIRMAN: But do you still use copper tubes?

A. Yes.

CHAIRMAN: Because I'm not familiar with that.

A. Okay.

CHAIRMAN: So gas they might use copper tubes, but the joints will not use soldering; is that correct?

A. Yes.

CHAIRMAN: So, in other words, in a present-day public rental housing unit, they would not use leaded material, leaded solder; is that the case?

A. Yes, you can say so.

COMMISSIONER LAI: What about drains?

A. They use rubber hoses.

CHAIRMAN: Well, aircon -- the Housing Department doesn't provide aircon; right? Are they that generous? Do they provide aircon?

Do we have Housing Department representatives?

MR DOWNEY: (In English) I will take instructions, Mr Chairman.

CHAIRMAN: The Housing Department doesn't provide aircon; I don't think so. I wouldn't surmise that they would be that generous.

So, in other words, a present-day public rental housing construction site -- oh, wait a second.

Are there locations -- what about the car park, where they wash their cars? That is fresh water but it's not for human consumption.

A. Right.

CHAIRMAN: They might it use for flowers, plants.

A. Right. Well, I wouldn't know that.

CHAIRMAN: Okay.

When you took the grade II licence, 1977, did you need to study the Waterworks Ordinance?

A. No, only for grade I. Grade I had to study the Waterworks Ordinance.

CHAIRMAN: So it was only a requirement in 1992?

A. Because grade II only did simple maintenance and repair work, but grade I, they had to apply for water meter, they had to submit forms, documents, diagrams; that was the grade I responsibility.

CHAIRMAN: So, in 1977, you did not need to know BS 864 part 2?

A. Yes, we studied them.

CHAIRMAN: 1977, 864 --

A. Well, at the gas company, we would work with copper tubes. The instructors would talk about that.

CHAIRMAN: Well, because 864, it was only published in 1983. There might have been a previous British Standard.

A. It's a small, little pamphlet.

CHAIRMAN: Okay.

COMMISSIONER LAI: So in 1992, when you took the grade I test, you were already a grade II instructor.

A. Right.

COMMISSIONER LAI: When you took the test, did you have to attend lectures?

A. No.

COMMISSIONER LAI: Did you enrol in a course?

A. Prior to 1992, the 5267, we didn't need the practical component.

CHAIRMAN: In 1992, you took 5267?

A. Right. The certificate was issued in 1991. It was issued in November-December. That's why I wrote it down as 1992.

CHAIRMAN: Well, you did take a course. Afterwards, did you take a test?

A. Yes. Yes.

CHAIRMAN: No oral test, just a written test?

A. It was conducted by VTC, so some --

CHAIRMAN: Yes, I understand. Okay. Okay.

At the gas company, they taught you how to use copper pipes, back in the 1970s, and you were told not to use leaded solder. Why would the gas company tell you to use lead-free solder? What was the reason?

A. As we said just now, our equipment, it's connected to cold water, hot water; it's connected to the fresh water supply. So that's why they emphasise that.

CHAIRMAN: Okay.

Anybody else with questions?

Okay. Thank you, Mr Leung. Thank you for giving evidence. You can leave. Thank you.

(The witness withdrew)

Any other witnesses?

MR KHAW: No. The Plumbing & Sanitary Ware Trade Association will give evidence tomorrow. After tomorrow's evidence, next week we will start with WSD

witnesses.

CHAIRMAN: Okay. So we will adjourn here and continue tomorrow morning. Thank you.

(3.27 pm)

(The hearing adjourned until 10.00 am the following day)

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