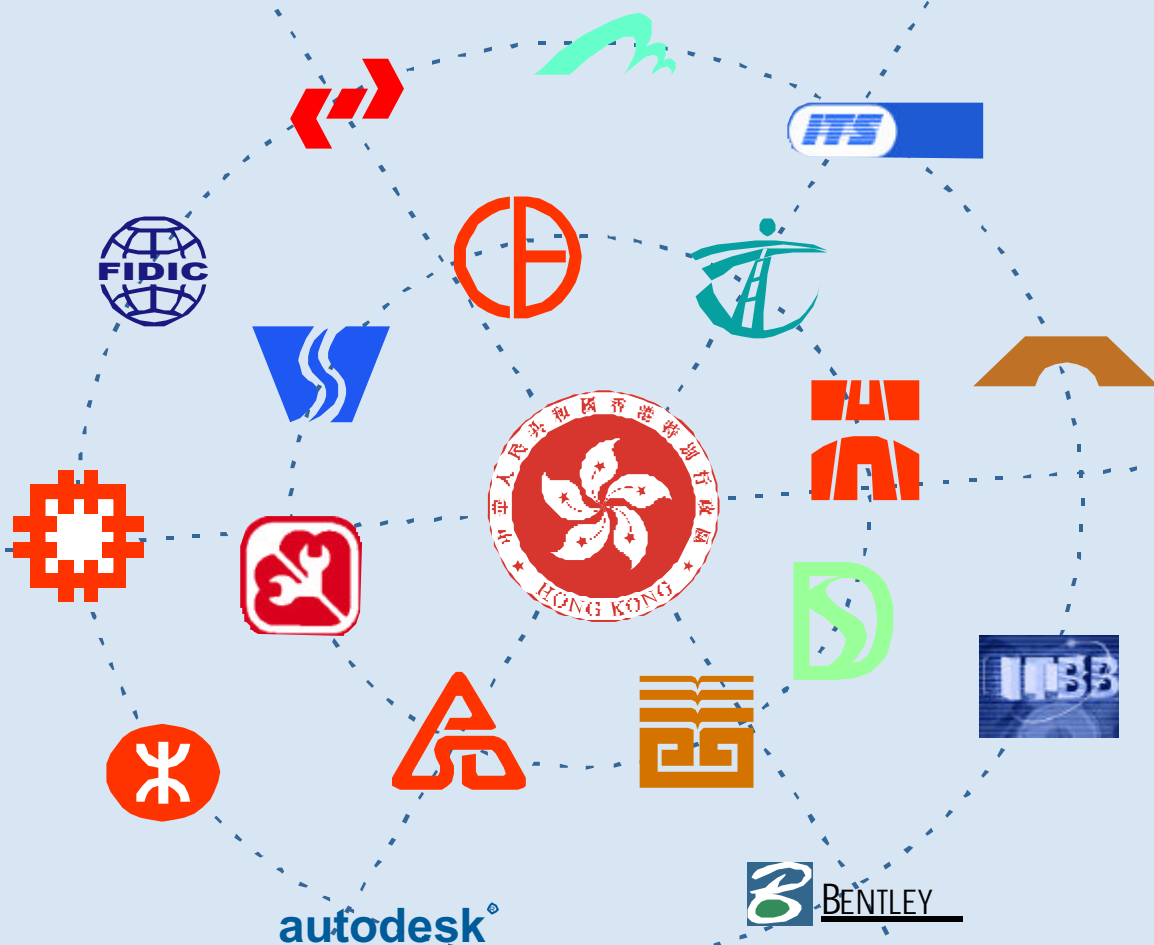




The Government of the Hong Kong
Special Administrative Region
Works Bureau



Agreement No. CE 15/2000

Study on CAD Standard for Works Departments

Consultation Report (Final Version)

January 2002

安建顧問有限公司
Atkins China Ltd

Supported by

INTERGRAPH
HongKong Limited

amemberoftheWSAtkinsgroupofcompanies

阿特金斯集團
WS/Atkins

Agreement No. CE 15/2000

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<i>Project</i>	Agreement No. CE 15/2000 Study on CAD Standard for Works Departments			
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Not used.

1. INTRODUCTION

1.1. Background

1.1.1. The CAD Standard for Works Departments [CSWD] Assignment is split into five stages:

Stage 1 – Documentation of existing CAD standards in participating departments.

Stage 2 – Formulation of the functional requirements for the CSWD.

Stage 3 – Development of the preliminary CSWD.

Stage 4 – Consultation with stakeholders on the preliminary CSWD.

Stage 5 – Delivery of the final CSWD, taking into account the comments received during the consultation process.

1.1.2. This is the final report of Stage 4 and summarises the results of the Consultation exercise.

1.2. Purpose of Stage 4

1.2.1. The purpose and requirements of Stage 4 of the Study are described below in paragraphs 1.2.2 to 1.2.10, being an extract from the Study Brief. The requirements pertaining to the Consultation Exercise and the reporting of it are highlighted in bold for ease of reference.

1.2.2. ***In this stage, the Consultants shall be responsible for consulting the Stakeholders on the preliminary CSWD. The purposes of the exercise are:***

- ***to introduce CSWD to the Stakeholders;***
- ***to secure support for CSWD; and***
- ***to obtain the feedback on CSWD in particular the requirements and concerns of the Stakeholders.***

1.2.3. This stage of the study is divided into four sub-stages as follows:

- (i) *formulation of consultation plan;*
- (ii) *production of consultation document (as defined in clause 1.2.5);*
- (iii) ***consultation; and***
- (iv) ***report on the consultation exercise (the “consultation report”).***

1.2.4. Upon the obtaining the approval stipulated in clause 1.2.5 (below) for the preliminary CSWD, the Consultants shall formulate the consultation plan covering:

- (i) *the overall strategy for conducting the consultation exercise, including-*
 - (i) *the arrangements for presenting the CSWD to Stakeholders and for obtaining their feedback;*

- (ii) *the arrangements for putting the CSWD (including the database in clause 6.5.3 of the Brief (the symbols database) and the applications in clause 6.5.5 of the Brief (the two Standard Interface demonstration applications)) to trial use by not more than 50 participants to be nominated by Stakeholders and for obtaining the comments from the participants;*
 - (ii) *the programme for:*
 - (i) *distribution of the consultation documents;*
 - (ii) *making presentation to Stakeholders;*
 - (iii) *obtaining comments from Stakeholders*
 - (iv) *conducting trial use of the CSWD and obtaining comments from participants;*
 - (v) *collating the comments and formulating responses; and*
 - (vi) *disseminating the results of the consultation exercise.*
- 1.2.5. *For the purpose of the consultation exercise, the Consultants shall produce a consultation document in accordance with the following outline:*
- (i) *brief description of the scope, structure and major provisions of CSWD;*
 - (ii) *development process for CSWD;*
 - (iii) *benefits of CSWD to Participating Departments and the construction industry as a whole;*
 - (iv) *programme for implementing CSWD;*
 - (v) *proposed arrangement for disseminating CSWD; and*
 - (vi) *administrative arrangement for updating CSWD.*
- 1.2.6. *The presentation of the hard copy of the consultation document shall comply with the following requirements:*
- (i) *It shall be of reasonable aesthetic quality;*
 - (ii) *Its layout shall be designed by professional artists experienced in producing document of similar nature;*
 - (iii) *The document shall include illustrations with vivid colour and produced to high professional standards;*
 - (iv) *The Consultants shall minimize the cost of producing the hard copies by adopting the following measures-*
 - (i) *use of inexpensive bindings; and*

- (ii) *avoiding the use of glossy papers for the cover and main pages;*

The length of the consultation document shall not exceed 20 A4 size pages.

1.2.7. *The presentation of the HTML version of the consultation document shall comply with the requirements of clause 5.4.3 of the Brief (general requirements for HTML versions) and the following additional requirements:*

- (i) *Its aesthetic quality shall be commensurate with that of typical corporate web sites;*
- (ii) *Its layout shall be designed by professional web designers and artists;*
- (iii) *The HTML version shall include ample illustrations and multimedia contents with vivid colours. The multimedia contents shall make reasonable use of sound, videos and animations to facilitate more effective communication of the contents of the document.*

1.2.8. *The Consultants shall publish the HTML version on the web site of WB if the Director's Representative so directs.*

1.2.9. ***Upon obtaining the approvals stipulated in clause 5.2.1 of the Brief (approval by the Working Group) for the consultation document and consultation plan, the Consultants shall complete the consultation exercise in accordance with the approved plan, including providing all the necessary resources, support and coordination for conducting the trial on CSWD.***

1.2.10. ***Upon the completion of the consultation exercise, the Consultants shall produce the consultation report that shall include:***

- (i) ***concise summary of the comments made by the Stakeholders and participants of the trial use; and***
- (ii) ***responses to the comments in sub-clause (i) above and the follow-up actions which have been taken or will be taken on them.***

1.3. Implementation of the Consultation Exercise

1.3.1. The Consultation Exercise was carried out in two parts;

- (i) To address the requirements of Para 1.2.2 above, a series of presentations were held following the distribution of the Consultation Document.
- (ii) To address the requirements of Para 1.2.9 above, a trial of the CSWD was held.

1.4. Structure of this Report

1.4.1. This Consultation Report is structured as follows:

- Section 2 describes the presentations that were held;
- Section 3 reports on the feedback from those presentations;
- Section 4 describes the trials that were held, while
- Section 5 draws conclusions and makes recommendations for changes to the preliminary CSWD as a result of the consultation exercise. It also documents the outstanding actions to be resolved prior to completion of the Study.

1.4.2. A number of appendices are attached:

- Publicity material that was generated to publicise the consultation exercise is contained within Appendix A;
- Appendix B contains a list of stakeholders that were represented at the consultation presentations;
- A hard copy of the presentation made to stakeholders is provided in Appendix C;
- A copy of the questionnaire given to attendees at the presentations is included in Appendix D;
- Responses to comments arising from the presentations are given in Appendix E;
- Appendix F contains responses to comments received from the Hong Kong Institute of Architects;
- Appendix G contains AutoCAD and Microstation copies of the drawing that was generated in the data transfer exercise as part of the trials; and finally
- Appendix H contains responses to comments that were received regarding the trials.
- Appendix I contains comments and responses on the draft version of this report, which was circulated to the Study's Working Group members.

2. PRESENTATIONS**2.1. Distribution of the Consultation Document**

- 2.1.1. Two hundred copies of the Consultation Document were printed. These were distributed on Monday 8th October 2001 to participating departments and stakeholders:

Department	No of copies
Architectural Services Department	4
Civil Engineering Department	4
Drainage Services Department	4
Electrical & Mechanical Services Department	3
Highways Department	4
Information Technology Services Department	2
Territory Development Department	3
Transport Department	3
Water Supplies Department	4

Table 2.1 – Consultation Document Distribution List to Participating Departments

Organisation	No of copies
Association of Consulting Engineers (one copy sent to each individual member company)	44
Autodesk Far East Ltd	1
Bentley Systems Hong Kong Ltd	1
Buildings Department	1
Hong Kong Construction Association	50
Hong Kong Electrical & Mechanical Contractors Association	6
Hong Kong Institute of Architects	20
Housing Authority	1
Joint Utilities Policy Group	8
Kowloon Canton Railway Corporation	1
Lands Department	1
Mass Transit Railway Corporation Limited	1
Planning Department	1

Table 2.2 – Consultation Document Distribution List to Stakeholders

- 2.1.2. The Consultation Document was also posted in HTML and PDF formats on the Works Bureau web site.

2.2. Publicity for the CSWD

- 2.2.1. In addition to the distribution of the Consultation Document, two initiatives were taken to publicise the consultation exercise.
- 2.2.2. The first of these was through an interview given to the I-mail newspaper's construction reporter, which resulted in an article appearing in the newspaper on 9th October 2001. A copy of the article is provided in Appendix A.
- 2.2.3. The second was through an article that appeared in the introduction to the weekly construction news "Skyline Morning Briefing" – an electronic newsletter. A copy of the article, which was issued on 11th October 2001, is also given in Appendix A.
- 2.2.4. Invitations to attend presentations of the proposed standards were given with the Consultation Document and in the publicity articles.

2.3. Presentation Sessions

- 2.3.1. Presentations of the CSWD were held over a period of two weeks between 19th October and 1st November 2001.
- 2.3.2. The first five were given to the participating departments in the following schedule. Sessions were divided between AutoCAD and Microstation-using departments.

Department(s)	Date of Presentation
HyD and TD	19.10.01
ArchSD	22.10.01
EMSD and WSD	23.10.01
DSD and TDD	24.10.01
CED and ITSD	26.10.01

- 2.3.3. An excellent response was received from stakeholders wishing to attend the presentation sessions. The organisations attending are listed by type below. A full list of attendees is given in Appendix B.

Type of Organisation	Number attending presentations
Consultant / Architect	26
Contractor	24
Utility Company	7
Government / Quasi-Government	6
CAD System Supplier	1

- 2.3.4. The response received resulted in the planned three presentations being increased to five sessions. In total, 126 individuals attended the stakeholders presentations, with a further 102 attending the presentations to the participating departments.

2.4. Overview of Presentations

- 2.4.1. The presentations were divided into three parts. The first part was an overview of the CSWD and repeated the information given in the Consultation Document. A hard copy of the Powerpoint slides used for this are contained within Appendix C of this report. Most of the presentations were given in Cantonese. The topics covered were:

- Purpose of the CSWD
- Benefits of the CSWD
- Purpose of the Consultation
- Implementation Programme
- The Standards

- 2.4.2. The second part consisted of a demonstration of drawings created to the standards in AutoCAD and Microstation. The topics covered were:

- Folders
- File naming
- Structuring of drawings
- Model files
- Layer naming
- File settings
- Creating a new drawing
- Creating new layers manually
- Creating layers by importing an existing level table / template file
- Data exchange

- 2.4.3. The last part of the presentations consisted of a Questions and Answers session. The presentations generally lasted for two hours.

Not used.

3. FEEDBACK FROM PRESENTATIONS**3.1. Feedback Questionnaire**

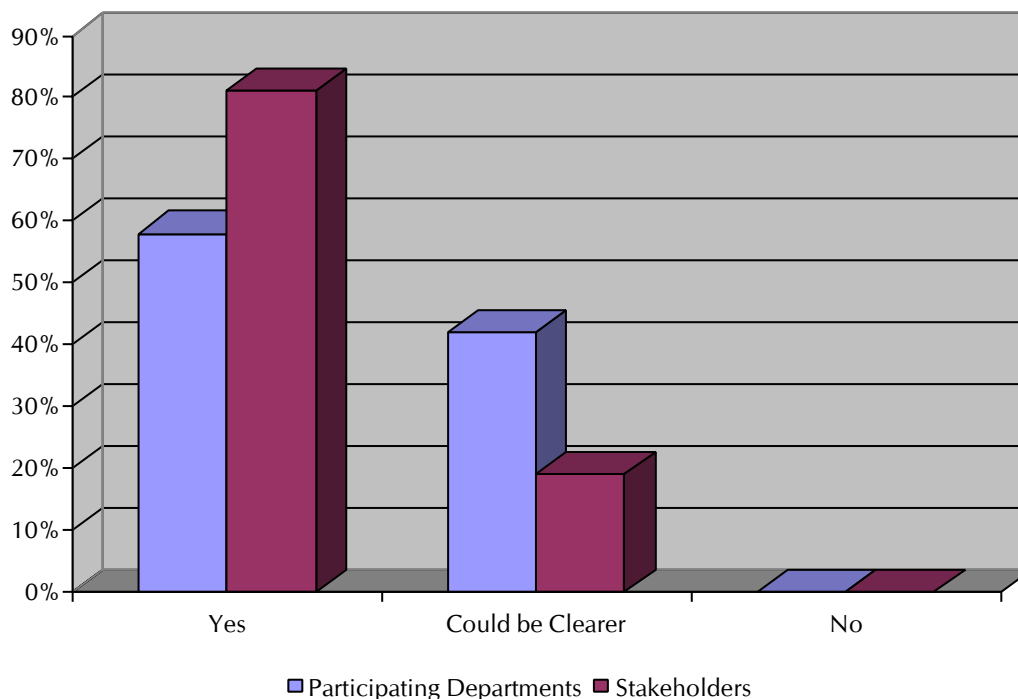
- 3.1.1. A Feedback Questionnaire was given to attendees at all of the presentations. A copy of the questionnaire is given in Appendix D.
- 3.1.2. The questionnaire was designed such that recipients could simply 'tick boxes' to a series of questions and add as many, or as few, comments as they wished.

3.2. Statistical Results of Feedback

- 3.2.1. The primary questions asked in the questionnaire were:

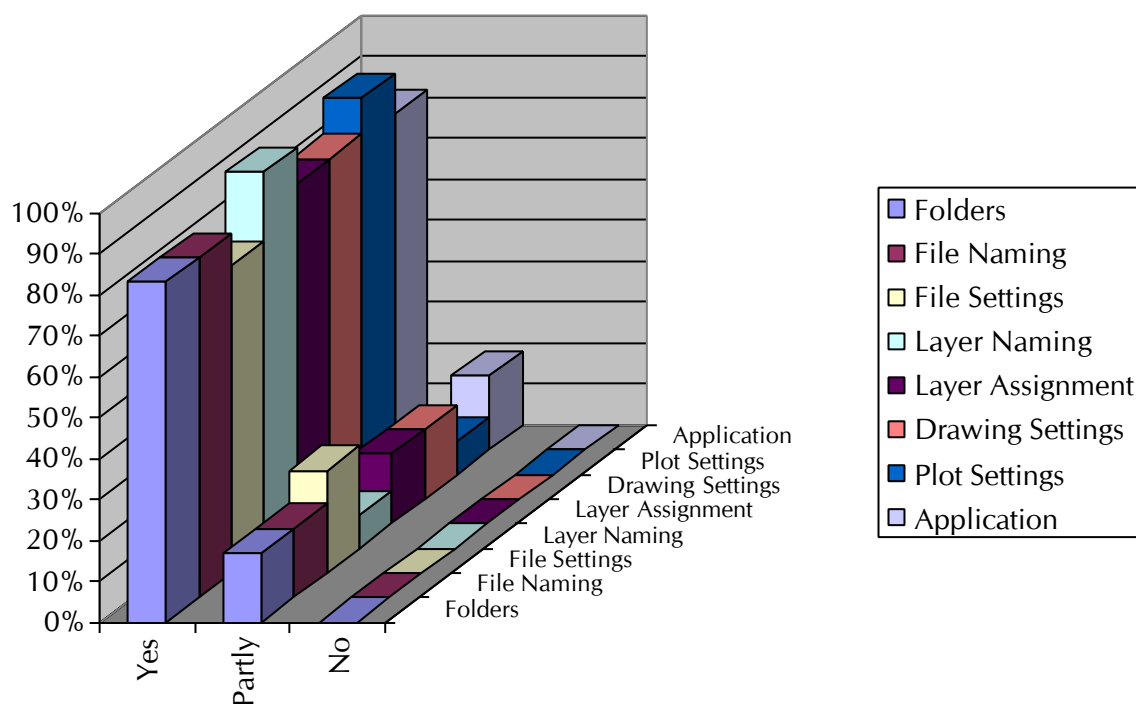
1. Are the proposed standards clearly presented?
2. Do you understand the proposed standards?
3. Do you think it will be easy to work to the standards?
4. Are there any changes to the proposed standards that you would suggest?
5. Do you think that the CSWD will bring benefits to the Construction Industry in Hong Kong?

- 3.2.2. Responses to Question 1 – Are the proposed standards clearly presented?

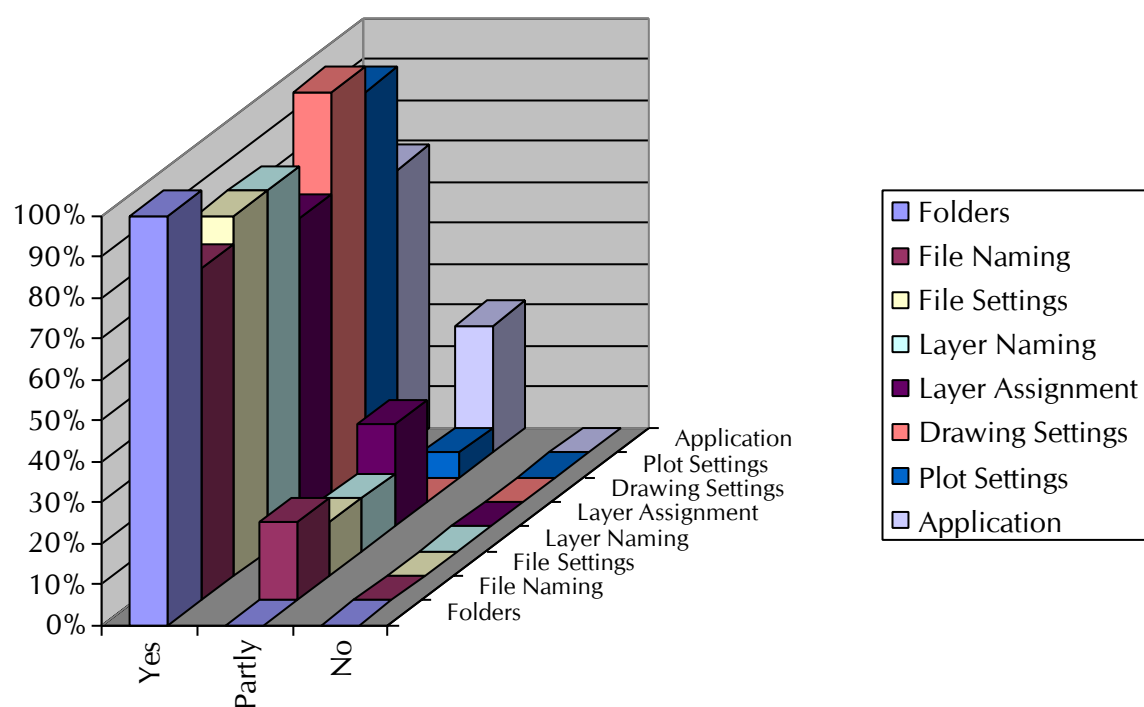


81% of stakeholders thought that the standards were clearly presented while 58% of participating departments' users thought the same. The remainder of each group thought that the presentations could be clearer. No respondents answered "No" to this question.

3.2.3. Responses to Question 2 – Do you understand the proposed standards?



Above – Responses from Participating Departments

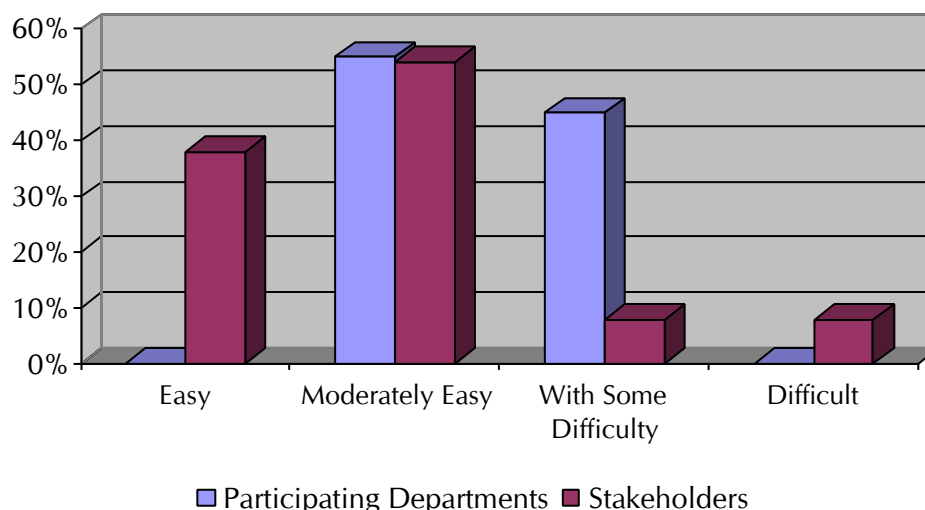


Responses from Stakeholders

Participating departments' users found layer naming and plot setting most understandable with file settings scoring lowest. Most other items were understood by 80% of respondents. All other responses returned "partly"; none replied "No".

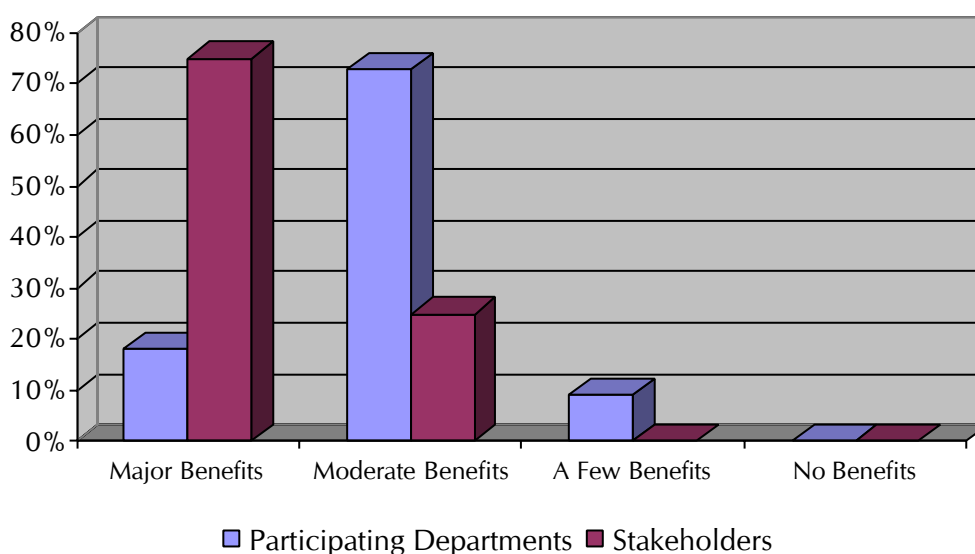
Stakeholders' positive responses were generally higher, with folders and drawing settings scoring 100%, implying full understanding. Scoring lowest was "application". Again, no "No" responses were received.

3.2.4. Responses to Question 3 – Do you think it will be easy to work to the standards?



None of the participating departments' respondents thought that it would be easy to work to the CSWD – responses were 55% "moderately easy" and 45% "with some difficulty". However, 38% of stakeholders responded "easy" to the question and 53% "Moderately Easy". 9% of stakeholders thought that working to the CSWD would be difficult.

3.2.5. Responses to Question 5 – Do you think that the CSWD will bring benefits to the Construction Industry in Hong Kong?



74% of stakeholders thought that the CSWD would bring major benefits to the Hong Kong construction industry. This view was only shared by 18% of respondents from the participating departments, the majority (72%) believing that there would be moderate benefits. No respondents thought that there would be no benefits.

3.3. Overview of Comments Received

3.3.1. Attendees at the presentations provided many useful comments and these are attached in Appendix E along with the CSWD Consultant's responses. In general, the comments can be categorised as follows:

- **Suggestions for Improvements to the Proposed Standards**

Several suggestions for changes to the standards were given and those that it is recommended are adopted are summarised in Section 5 of this Report.

- **Requests for Clarifications of the Proposed Standards**

A few requests for clarification were received; these primarily concerned the use of the proposed folder structure.

- **Concerns over Training**

A number of respondents pointed out that the presentation of the standards did not constitute training and that formalised training should be made available.

- **Concerns over Effort Required to Implement the CSWD**

A few respondents expressed concern over the implementation of the standards within their organisations and the changes to existing standards and practices that would be required.

- **Concerns over applicability to Small Projects / Simple Drawings**

A small number of respondents expressed the opinion that the standards were too complex for small projects.

- **Questions regarding Application of the Standards**

The way in which the standards would be applied to specific situations was queried by some respondents.

3.3.2. The Hong Kong Institute of Architects also provided a comprehensive set of comments from its members. One of the main contributors to these comments was LPT Architects, who were kind enough to demonstrate their use of CAD to the CSWD Consultant team. The HKIA's comments, together with the CSWD Consultant team's responses are given in Appendix F.

4. TRIALS**4.1. Format of the Trials**

4.1.1. The trials consisted of two parts:

- (i) The creation of some typical drawings by the participating departments, which did not reference other departments' work.
- (ii) A data exchange trial.

4.1.2. Details of these two exercises are given below.

4.2. Information Provided

4.2.1. At the outset of the trial, Departments were provided with the following CSWD files:

Microstation Users

CSWD_FONT.rsc	CSWD font resource file containing lands chines font
CSWD_FS.plt	CSWD plot configuration file for B&W full size drawings
CSWD_HS.plt	CSWD plot configuration file for B&W half size drawings
CSWD_M.dgn	CSWD seed file for metres drawings
CSWD_MM.dgn	CSWD seed file for millimetres drawings

AutoCAD Users

BFHEIN2101.ttf	LANDS Chinese Font in true type font format
CSWD_FS.ctb	Sample CSWD plot settings file for B&W full size drawings
HP_GL2.pc3	Sample CSWD plot driver

4.2.2. In addition to the above, departments were provided with the following CSWD settings file and mapping tables to test the data exchange process :

CSWD_DWGCONTROL.bqs	CSWD settings file
CSWD_FONT.tbl	CSWD font mapping table
CSWD_WTWD.tbl	CSWD width weight mapping table
CSWD_WTW1.tbl	CSWD weight mapping table – import template
CSWD_WTW2.tbl	CSWD weight-weight mapping table – export template

4.3. Departmental Typical Drawings

4.3.1. A description of the drawings created by each participating department, together with a review of their compliance with the CSWD follows.

4.3.2. Architectural Services Department – Architectural Branch

Item	Consultant' s Comments
File Naming	A_D6420ME07N.dwg AB provided one file containing all data. This file would be categorised as a drawing file under the CSWD, so the Department's current file naming convention can be adopted for this file. The above file name would suggest that it has been named using the CSWD naming convention for model files – if this is the case the file ID reference has mistakenly been assigned 8 characters rather than 6.
Layer Naming and Assignment	AB has demonstrated a good understanding of the CSWD layer naming convention. Good use has been made of the CSWD element codes and the user definable field has been utilised to incorporate ArchSD's current annotation codes. Dimensions have currently been placed on layer A_010__ (Titles and Frames – Grouped). They should be placed on layer A_030__ (Dimensions – Grouped)
General	Good use has been made of the CSWD, the majority of the data is in full compliance with the CSWD. We note the use of the “ DEFAULT” lineweight on layer A_246__. The “ DEFAULT” lineweight has not been included in the CSWD as users can redefine its line thickness value, which could result in inconsistency. We note the use of colour 8 – Under the CSWD colour 8 will plot as grey scale. The CSWD recommends that only colours 250-245 be utilised as grey scales.
Conclusion	AB has demonstrated a good understanding of the CSWD and has taken full advantage of its flexibility by incorporating their current layer naming convention into the CSWD layer naming convention.

4.3.3. Architectural Services Department – Building Services Branch

Item	Consultant' s Comments
File Naming	B_PAC001N.dwg B_PEE001N.dwg BS8888AC001.dwg BS8888EE001.dwg BSB has provided a selection of model files and drawing files. The model files only have 5 characters in the file ID reference. The file ID reference should have a fixed length of 6 characters. Underscore characters should be used to represent empty/unused characters.
Layer Naming and Assignment	BSB has demonstrated a good understanding of the CSWD layer naming convention. Good use has been made of the CSWD element codes and the user definable field has been utilised to incorporate ArchSD's current annotation codes.

Item	Consultant' s Comments
General	<p>Good use has been made of the CSWD.</p> <p>We note the use of the “ DEFAULT” lineweight on all layers in the model files. The “ DEFAULT” lineweight has not been included in the CSWD as users can redefine its line thickness value, which could result in inconsistency.</p> <p>We note the use of colours 8 and 9 – Under the CSWD colours 8 and 9 will plot as grey scales. The CSWD recommends that only colours 250-245 be utilised as grey scales.</p>
Conclusion	<p>BSB has demonstrated a good understanding of the CSWD and has taken full advantage of its flexibility by incorporating their current layer naming convention into the CSWD layer naming convention.</p> <p>For consistency and to facilitate the data exchange process it is recommended that all data is assigned a lineweight value taken from the CSWD rather than been assigned the “ DEFAULT” lineweight.</p>

4.3.4. Architectural Services Department – Structural Branch

Item	Consultant' s Comments
File Naming	<p>S_D6420ME07N.dwg</p> <p>SB has provided one file containing all data. This file would be categorised as a drawing file under the CSWD, so Department's current file naming convention can be adopted for this file. The above file name would suggest that it has been named using the CSWD naming convention for model files – if this is the case the file ID reference has mistakenly been assigned 8 characters rather than 6.</p>
Layer Naming and Assignment	<p>SB has demonstrated a good understanding of the CSWD layer naming convention. Good use has been made of the CSWD element codes including the use of the fourth character in the element code field to distinguish different types of drawing symbols (S_0501_, S_0502_, S_0503_). The user definable field has also been utilised to incorporate ArchSD's current annotation codes.</p>
General	<p>Good use has been made of the CSWD.</p> <p>We note the use of the “ DEFAULT” lineweight on all layers. The “ DEFAULT” lineweight has not been included in the CSWD as users can redefine its line thickness value, which could result in inconsistency.</p> <p>We note the use of a text width factor of 1, the CSWD uses a text width factor of 0.8.</p> <p>We note the use of colour 9 – Under the CSWD colour 9 will plot as grey scale. The CSWD recommends that only colours 250-245 be utilised as grey scales.</p>
Conclusion	<p>SB has demonstrated a good understanding of the CSWD and has taken full advantage of its flexibility by incorporating their current layer naming convention into the CSWD layer naming convention.</p> <p>For consistency and to facilitate the data exchange process it is recommended that all data is assigned a lineweight value taken from the CSWD rather than been assigned the “ DEFAULT” lineweight.</p>

4.3.5. Civil Engineering Department

Item	Consultant' s Comments
File Naming	<p>C_DRWNDET.N.dgn</p> <p>C_ERWELEV.N.dgn</p> <p>GED3559.dgn</p> <p>C_B1FRAME.dgn</p> <p>CED provided one drawing file and two model files. The file naming used for the files, demonstrates that CED fully understand the file naming convention in the CSWD. Meaningful abbreviations have been used for the File ID reference so users can ascertain the contents of the file.</p>
Layer Naming and Assignment	<p>The files CED has provided contain a wide variety of data which has been logically split onto a large number of layers, giving users the opportunity to make extensive use of the CSWD element codes and to demonstrate a good understanding of the CSWD layer naming convention. Good use has been made of the CSWD element codes including the use of the fourth character in the element code field to distinguish between different elements within the same class. Good use has also been made of the user definable field</p> <p>We note that file C_DRWNDET.N contains concrete outline data on layer C_1971_, this layer should contain reinforcement only, the outline data should be placed in the relevant outline layer i.e. C_1601_.</p>
General	<p>In general very good use has been made of the CSWD, the majority of the data is in full compliance with the CSWD.</p> <p>We note the wrong colour table is being used on all files which would suggest that the files were not created using the CSWD seed files</p> <p>We note the use of Font 1 for the notes in file GED3559, Font 1 is not included in the CSWD.</p> <p>We note the metres working units setting has been used for files C_ERWELEV.N and GED3559, and the millimetres working units setting has been used for file C_DRWNDET.N.</p>
Conclusion	<p>CED has demonstrated a very good understanding of the CSWD. The use of a variety of data has given the users the opportunity to familiarise themselves with a range of CSWD element codes.</p> <p>Care should be taken when referencing model files with different working units into the same drawing file.</p>

4.3.6. Drainage Services Department

Item	Consultant' s Comments
File Naming	<p>DRAWING BORDER.dgn</p> <p>D_DTHRUST.N.dgn</p> <p>PROJ_NO-THRUSTBOX_.dgn</p> <p>DSD provided a model file and drawing file. The file naming used for these files demonstrates a full understanding of the file naming convention in the CSWD</p>
Layer Naming and Assignment	<p>Drawing file PROJ_NO-THRUSTBOX_ has no layer names defined, layer name D_010__ (Titles and Frames Grouped) could be used for all data held in this file.</p> <p>Model file D_DTHRUST.N contains layer names which comply to the CSWD but some of the information contained on these layers does not comply with the CSWD:</p> <p>DSD layer names and content:</p> <ul style="list-style-type: none"> D_184_S Thrust block elements

Item	Consultant' s Comments
	<ul style="list-style-type: none"> • D_031_A Dimensions, titles and section marks • D_050_A Symbols • D_060_A Hatching • D_025_S Pipes <p>Consultant's recommended layer names and content</p> <ul style="list-style-type: none"> • D_184_S Thrust block elements • D_031_A Dimensions • D_040_A Titles • D_050_A Symbols and Section Marks • D_060_A Hatching • D_924_S Pipes
General	<p>Drawing file PROJ_NO-THRUSTBOX_ has made good use of the CSWD and is in compliance with the CSWD. This file is a 3D Microstation file and has been saved with the CSWD global origin, working units, and colour table.</p> <p>Model file D_DTHRUSTN is not in compliance with the CSWD, it is a 2D CAD File, it is not using the CSWD colour table and it uses font 1 for dimensions and font 26 for angles both of which are not in the CSWD.</p>
Conclusion	<p>It is likely that drawing file PROJ_NO-THRUSTBOX_ which complies with the CSWD in most cases is a new file that has been created using the CSWD seed files, whereas model file D_DTHRUSTN is an existing file which users have updated to be in compliance with the CSWD.</p> <p>This would imply that users are more confident using the CSWD on new drawings where a lot of the settings are predefined in the CSWD seed files, rather than trying to update existing drawings to the CSWD.</p>

4.3.7. Electrical & Mechanical Services Department

Item	Consultant' s Comments
File Naming	<p>E_E-016_0.dgn</p> <p>E_FRAME_A1.dgn</p> <p>File E_E-016_0 would be categorised as a drawing file under the CSWD so the Department's current file naming convention can be adopted for this file.</p>
Layer Naming and Assignment	<p>EMSD has demonstrated a good understanding of the CSWD layer naming convention. Good use has been made of the CSWD element codes.</p> <p>The drawing number, scale and revision text have been placed on the same layer as the drawing title layer E_013__ (Drawing Title)</p> <p>If it is wished to group all of this information, it would be best placed on layer E_010__(Titles and Frames Grouped).</p>
General	<p>Very good use has been made of the CSWD, Romans font has been used for all text and only the line thicknesses listed in the CSWD have been used.</p>
Conclusion	<p>EMSD has demonstrated a very good understanding of the CSWD.</p>

4.3.8. Highways Department – Research and Development Division and Structures Division (HyD-RDS)

Item	Consultant' s Comments
File Naming	<p>H_DGA_CON.dgn</p> <p>H_DGL_CON.dgn</p> <p>H_PFBLAY_N.dgn</p> <p>H_PSTB1__N.dgn</p> <p>H_PSURVEYN.dgn</p> <p>SDNS4032_DP0003C.dgn</p> <p>STB1-ISO.dgn</p> <p>STS33600-GA0011.dgn</p> <p>STS33600-GL0011.dgn</p> <p>HyD-RDS has provided a series of model files and drawing files. The file naming used for these files demonstrates a full understanding of the file naming convention in the CSWD</p>
Layer Naming and Assignment	<p>Not all of the files contained CSWD layer names, but those that do demonstrate that HyD-RDS has a good understanding of the CSWD layer naming convention. The model files contain a wide variety of data, which has been logically split onto a large number of layers, giving users the opportunity to familiarise themselves with the CSWD element codes. Users appear to have utilised the user definable field to incorporate a HyD-RDS standard categorisation code, which demonstrates the flexibility of the CSWD in giving users scope for incorporating some of their existing standards.</p> <p>We note that only one character has been used in the agent responsible field, this field should be two characters i.e. H_.</p>
General	<p>Good use has been made of the CSWD, the majority of the data is in compliance with the CSWD.</p> <p>We note that some of the files supplied were 2D Microstation files rather than 3D due to time constraints.</p> <p>We note a number of the files contained the wrong colour table.</p>
Conclusion	HyD-RDS has demonstrated a good understanding of the CSWD.

4.3.9. Highways Department – Railway Development Office (HyD-RDO)

The Railway Development Office has provided 80 files in total. For the purpose of this report we have randomly selected three model files and two drawings files to check for compliance with the CSWD.

Item	Consultant' s Comments
File Naming	<p>HRWR-C02N.dgn</p> <p>HRPLRTA00E.dgn</p> <p>HRPPBLA00N.dgn</p> <p>RWWR0001-LI0901.dgn</p> <p>RWWR0001-CS0901.dgn</p> <p>The file naming convention used for the three model files demonstrates that HyDRD has an</p>

Item	Consultant' s Comments
	<p>understanding of the file naming convention in the CSWD.</p> <p>We note that for the purpose of this trial the Railway Development Office would appear to have created their own agent code (HR) – this is in line with the proposed expansion of the Agent codes.</p> <p>We note that file HRWR-C02N is using (W) as the view code, the file contains a cross section so should be using (S) in the view code.</p>
Layer Naming and Assignment	<p>HyDRD has developed a series of standard layer tables for the purpose of this trial. We note that sub classes have been used on all layer names i.e.</p> <ul style="list-style-type: none"> • HR0101_ Titles and Frames (Grouped) • HR0200_ Grids (Grouped) • HR0300_ Dimensions (Grouped) <p>We would not recommend the use of sub classes in the above examples, we would use the following:</p> <ul style="list-style-type: none"> • HR010__ Titles and Frames (Grouped) • HR020__ Grids (Grouped) • HR030__ Dimensions (Grouped) <p>The purpose of sub classes is to sub-divide classes to enable users to distinguish between different elements of the same class. For example, with the text classes, users may see a need to sub-divide Chinese and English text. This will enable users to switch Chinese and/or English text on and off for different drawings i.e.</p> <ul style="list-style-type: none"> • HR0411_ Titles English Text • HR0412_ Titles Chinese Text <p>With the use of the layers HyD-RDO has demonstrated full understanding of the CSWD layer assignment. It is good to see the efficient use of standard layer tables as this not only helps users familiarise themselves with the element codes but also avoids users having to spend time creating layers.</p>
General	<p>Good use has been made of the CSWD, the majority of the data is in full compliance with the CSWD.</p> <p>Good use has been made of the CSWD grey scales.</p> <p>We note the use of colour 8 in file HRWR-C02N, the CSWD recommends the use of grey scales 250-254 only.</p> <p>We note the use of Chinese Font 162 in file RWWR0001-CS0901, this is not part of the CSWD.</p>
Conclusion	<p>HyD-RDO has demonstrated a good understanding of the CSWD.</p> <p>Consideration needs to be given to the use of sub classes in the layer names.</p>

4.3.10. Territory Development Department

Item	Consultants Comments
File Naming	<p>A3FRAME.dgn</p> <p>M_PLOTBNDN.dgn</p> <p>M_PWZ1234N.dgn</p> <p>CSWD_KDO_SK01.dgn</p> <p>TDD has provided a series of files.</p> <p>File M_PLOTBNDN contains a boundary outline that is likely to be referenced by lots of other drawings. Therefore this would be categorised as a model file and named accordingly – as has been done.</p> <p>File M_PWZ1234N.dgn is a numbered drawing containing a setting out table, notes and title block information. This data is unique to this file and is unlikely to be referenced by any other drawings. Therefore this would be categorised as a drawing file under the CSWD so TDD's current file naming convention can be adopted for this file.</p>
Layer Naming and Assignment	TDD has demonstrated a good understanding of the CSWD layer naming convention with the files provided.
General	<p>Good use has been made of the CSWD, the majority of the data is in full compliance with the CSWD.</p> <p>We note that A3FRAME.dgn is a 2D Microstation file and uses Chinese Font 217. The CSWD recommends the use of 3D Microstation files only. Chinese Font 217 is not part of the CSWD so it loses its integrity when exchanged. It is recognised that aesthetically pleasing fonts may be required for text contained within drawing frames, to facilitate the data exchange process you may wish to consider "DROPPING" this text to shapes using Microstation's drop text command.</p>
Conclusion	<p>TDD has demonstrated a good understanding of the CSWD.</p> <p>Users can use this general rule to decide whether a file should be categorised as a model file or drawing file:</p> <ul style="list-style-type: none"> • Drawing files are numbered drawings, which contain data unique to that drawing. • Model files contain common data, i.e. data which is likely to be shown on more than one drawing

4.3.11. Transport Department

Item	Consultant' s Comments
File Naming	<p>T_PROADMKE.dgn</p> <p>T_PROADMKN.dgn</p> <p>T_PROADMKR.dgn</p> <p>TD has provided a series of model files, which were also used for the data exchange exercise. The file naming used for these files demonstrates a full understanding of the CSWD file naming convention.</p>
Layer Naming and Assignment	<p>For the purpose of this trial TD appear to have developed the following standard layer table for their Traffic Aids drawings:</p> <ul style="list-style-type: none"> • T_8301E Existing Road Alignments • T_8302E Existing Road Markings

Item	Consultant' s Comments
	<ul style="list-style-type: none"> • T_8303E Existing Traffic Light Signals • T_8304E Existing Restriction Zones • T_8305E Existing ATC Duct & Facilities • T_8306E Existing CCTV Duct & Facilities • T_8307E Existing ET Duct & Facility • T_8308E Existing VMS, LUS & AID • T_8309E Existing Road Chainage • T_8301N Proposed Road Alignments • T_8302N Proposed Road Markings • T_8303N Proposed Traffic Light Signals • T_8304N Proposed Restriction Zones • T_8305N Proposed ATC Duct & Facilities • T_8306N Proposed CCTV Duct & Facilities • T_8307N Proposed ET Duct & Facilities • T_8308N Proposed VMS, LUS & AID <p>Good use has been made of the user definable field to distinguish between existing and proposed elements. The simplistic use of the fourth character in the element code field duplicates element codes, which have all ready being assigned. We would recommend using the following element codes:</p> <ul style="list-style-type: none"> • T_810_E Existing Road Alignments • T_830_E Existing Road Markings • T_834_E Existing Traffic Light Signals • T_832_E Existing Restriction Zones • T_9401E Existing ATC Duct & Facilities • T_9402E Existing CCTV Duct & Facilities • T_9403E Existing ET Duct & Facility • T_839_E Existing VMS, LUS & AID • T_033_E Existing Road Chainage • T_810_N Proposed Road Alignments • T_830_N Proposed Road Markings • T_834_N Proposed Traffic Light Signals • T_832_N Proposed Restriction Zones • T_9401N Proposed ATC Duct & Facilities • T_9402N Proposed CCTV Duct & Facilities • T_9403N Proposed ET Duct & Facilities • T_839_N Proposed VMS, LUS & AID <p>Alternatively if it is wished to group all Traffic Aids data into a single layer the following could be used:</p> <ul style="list-style-type: none"> • T_830_E Existing Traffic Aids • T_830_N New Traffic Aids

Item	Consultant' s Comments
General	<p>TD's Traffic Aids drawings use Chinese Font 161, which is not part of the CSWD so it loses its integrity when exchanged. To resolve this problem and to facilitate data exchange a number of options exist:</p> <ul style="list-style-type: none"> • Include Font 161 in the CSWD • TD could adopt the CSWD Chinese Font • It was noted that some of the Chinese Text on the Traffic Aids drawings had been "DROPPED" to shapes, which resulted in the text maintaining its integrity during data exchange. TD could "DROP" all Chinese Text.
Conclusion	<p>TD has demonstrated a good understanding of the CSWD.</p> <p>The use of Chinese Font 161 and the options put forward for resolving the data exchange problems associated with it need to be reviewed and consideration needs to be given to the choice of layer names.</p>

4.3.12. Water Supplies Department

Item	Consultants Comments
File Naming	<p>B1FRAME.dgn</p> <p>W_PDRAIN_N.dwg</p> <p>W_PGRID__W.dwg</p> <p>W_PWMAIN_N.dwg</p> <p>W_PUTI____.dwg</p> <p>W108592ALI1.dwg</p> <p>W108592ALI2.dwg</p> <p>WSD provided a series of drawing files and model files.</p> <p>The file naming used for these files demonstrates a full understanding of the CSWD file naming convention.</p>
Layer Naming and Assignment	<p>WSD has demonstrated a full understanding of the CSWD layer naming convention. Very good use has been made of the CSWD element codes including the use of the fourth character in the element code field to distinguish between the 100m and 500m grid in the grid model file (W_PGRID__W). The user definable field has also been put to good use to distinguish between Portion A and Portion B in the proposed water main model file (W_PWMAIN_N).</p>
General	<p>Very good use has been made of the CSWD, the majority of the data is in full compliance with the CSWD.</p> <p>We note the use of colour 253 to display the government mapping as a grey scale – which complies with the CSWD.</p> <p>We note the use of the "DEFAULT" lineweight on some layers. The "DEFAULT" lineweight has not been included in the CSWD as users can redefine its line thickness value, which could result in inconsistency.</p>
Conclusion	<p>WSD has demonstrated a very good understanding of the CSWD.</p> <p>For consistency and to facilitate the data exchange process it is recommended that all data is assigned a lineweight value taken from the CSWD rather than been assigned the "DEFAULT" lineweight.</p>

4.4. Data Exchange Trial

- 4.4.1. To commence the data exchange portion of the trials, Highways Department created a background drawing using Microstation. Details follow:

File Name	Layer Names	Layer Description
KHC1010X-GL0001 Drawing File	H_010__	Title Frame
	H_0401__	Text (English)
	H_0402__	Text (Chinese)
	H_031__	Dimension Line And Text
	H_803__	Spot Levels
	H_046__	Legends
	H_051__	North Point
	H_819__	KMB Bus Shelters
	H_044__	Notes National Grids
	H_021__	National Grid
	H_022__	National Grid Text
H_PBASEMPW Model file containing base mapping	No Layer Names Information copied from LANDS Government Mapping Files.	
H_PROADWKN Model file containing plan of new road works	H_813_1	Carriageway Edges(Bus Bay)
	H_813__	Carriageway Edges
	H_815__	Verges
	H_916__	Fences
	H_971__	Building Outlines

- 4.4.2. The drawing was then translated into an AutoCAD dwg file using the preliminary CSWD settings file and mapping tables:

CSWD-DWGCONTROL.bqs CSWD settings file

CSWD_FONT.tbl CSWD font mapping table

CSWD_WTWD.tbl CSWD width weight mapping table

CSWD_WTW1.tbl CSWD weight mapping table – import template

CSWD_WTW2.tbl CSWD weight-weight mapping table – export template

In addition to the above mapping tables the Microstation default mapping tables were used.

- 4.4.3. AutoCAD and/or Microstation versions of the file were then sent to the other participating departments and also to the stakeholders that had volunteered to take part in the trial.

4.4.4. Recipients then created their own files, that referenced the HyD file, and added information typical of their departments' / organisations' work.

4.4.5. Details of the new data created follow.

Dept	CAD Package	File Name	Layers	Description
ArchSD	AutoCAD	A_PTHOUSEN Model file containing plan on new transformer house	A_0401_ A_280_V	Text Building Outline
CED	Microstation	C_PCEWORKN Model file containing plan on new civil engineering work	C_1161_ C_9821_ C_9161_ C_0401_ C_1621_ C_1162_ C_1251_ C_0301_ C_952_ C_962_ C_9511_ C_9561_ C_956_ C_9601_	Borehole Hydro-seeded Area Hoarding Type 1 Text (Eng) & Arrow Retaining Wall 1 Trial Pit Soil Nail Dimension Line & Text Seabed Contours Bollard Setting Out Point & Text Sloping Seawall Cope Line Of Seawall Landing Steps Landing Steps
DSD	Microstation	D_PSEWERLN Model file containing plan on new sewer line	D_933_P D_932_E D_933_E D_042_E D_042_P	Proposed Sewer Existing Manhole Existing Sewer Existing Pipe Size Proposed Pipe Size
EMSD	AutoCAD	E_PPALOUTN Model file containing plan on new communications line	E_643_2 E_643_1	Audio cable Audio pits and equipment
TDD	Microstation	M_PLOTBNDN Model file containing plan on new lot boundary	M_910__	Lot boundary outline

Dept	CAD Package	File Name	Layers	Description
TD	Microstation	T_PROADMKE Model file containing plan on existing road markings	T_8301E	Existing Road Alignments
			T_8302E	Existing Road Markings
			T_8303E	Existing Traffic Light Signals
			T_8304E	Existing Restriction Zones
		T_PROADMKN Model file containing plan on new road markings	T_8301N	Proposed Road Alignments
			T_8302N	Proposed Road Markings
			T_8303N	Proposed Traffic Light Signals
			T_8304N	Proposed Restriction Zones
		T_PROADMKR Model file containing plan on road markings to be removed	T_8301E	Existing Road Alignments
			T_8302E	Existing Road Markings
			T_8304E	Existing Restriction Zones
WSD	AutoCAD	W_PTEXT__N Model file containing text for new water mains	W_0401A	Proposed Fresh Water Main Portion 'A' – Text
			W_0401B	Proposed Fresh Water Main Portion 'B' – Text
			W_0402A	Proposed Salt Water Main Portion 'A' – Text
			W_0402B	Proposed Salt Water Main Portion 'B' – Text
			W_046__	Legend & Abbreviations
			W_080__	Temporary Information
		W_PWMAIN_E Model file containing plan on existing water mains	W_080__	Temporary Information
			W_511__	Fresh Water Main
			W_513__	Salt Water Main
		W_PWMAIN_N Model file containing plan on new water mains	W_0331A	Chainage Of Proposed Fresh Water Portion 'A'
			W_0331B	Chainage Of Proposed Fresh Water Portion 'B'
			W_0332A	Chainage Of Proposed Salt Water Portion 'A'
			W_0332B	Chainage Of Proposed Salt Water Portion 'B'
			W_080__	Temporary Information
			W_511_A	Proposed Fresh Water Main Portion 'A'
			W_511_B	Proposed Fresh Water Main Portion 'B'
			W_513_A	Proposed Salt Water Main Portion 'A'
			W_513_B	Proposed Salt Water Main Portion 'B'

- 4.4.6. These new files were then translated to AutoCAD and Microstation respectively using the preliminary CSWD settings file and mapping tables, so that a complete set of files existed in both AutoCAD and Microstation format.
- 4.4.7. Both AutoCAD and Microstation versions of all files were then sent to all participating departments.

- 4.4.8. In theory, each drawing would look the same and have the same structure. This theory was tested at a meeting held on 5th December 2001, to which each department brought the resulting drawing in hard and soft copy.
- 4.4.9. A copy of the combined drawing in both AutoCAD and Microstation format, with problems highlighted is contained in Appendix G.
- 4.4.10. The following comments were received at that meeting from the participants.

Department	Comments	Response
All (except TD)	Could not display all Chinese Text	TD's model files contained Traffic Aids data, which includes Chinese text. The Chinese font that TD use is not part of the CSWD so the Chinese text on TD's model files did not all display correctly. Some of the Chinese text in these files has been "dropped" to lines so this displays correctly.
ArchSD	No additional comments	Noted. We note that ArchSD produced their model file A_PTHOUSEN in millimetres. Although this is acceptable, to avoid any confusion this file was converted to metres before being forwarded to other Departments. This was to ensure that it automatically overlaid HyD's original drawing file and other Departments' model files, which were produced in metres.
CED	If a description is not provided for each layer name it is difficult for users to know what is held on that layer	Microstation allows users to give each layer a name and a description, where as AutoCAD only has a layer name. A possible solution is for the CSWD to recommend the inclusion of a CAD file data sheet in each model file. This would have a list of layer names with a description (Similar to the CSWD sample drawings on the WB web site). Since most CAD data will be held in model files it is recommended that the CAD file data sheet only be placed in model files. This will also resolve the problem highlighted by the HKIA that having elements outside the drawing frame in AutoCAD prevents the correct use of Batch Plot.

Department	Comments	Response
	During the data exchange process can hatch elements keep their integrity rather than reverting to individual single elements?	We will check to see if this is possible and include it in the CSWD data exchange process if it is possible.
HyD	<p>Users are sometimes not sure which element code should be used</p> <p>Can the CSWD make provision for the project reference to be included in the model file name?</p> <p>HyD requested the CSWD data exchange files</p>	<p>Once users start working to the CSWD they will become much more familiar with the CSWD element codes and the choice of which codes to use. Where users are unsure which element code to use it is more important that users make a decision and apply it consistently to that particular project, rather than be over-concerned as to whether it was the correct decision.</p> <p>Yes, an 8 character alphanumeric project reference field will be added between the agent and view field.</p> <p>These have been resent with guidelines on how to use them.</p>
EMSD	No additional comments	<p>Noted.</p> <p>We note that EMSD also produced their model file E_PPALOUTN in millimetres. The same conversion to metres made to the ArchSD drawing was also made to EMSD's file.</p>
TDD	<p>Can an element code be provided for reclamation?</p> <p>Can IPLOT be used?</p>	<p>Yes, element code 128 has now been assigned for reclamation.</p> <p>Yes, sample IPLOT files will be provided which will include:</p> <p>CSWD Paper Sizes</p> <p>CSWD Line Thicknesses</p> <p>CSWD Grey Scales</p>
TD	Had not received other Departments model files	<p>The files werehave been resent to TD.</p> <p>TD mentioned that it is their current practice to place all Traffic Aids data on one layer. This being the case it is recommended that layer T_830__ (Traffic Aids – Grouped) is used for existing drawings. If possible we would recommend that for new drawings the data be divided up into separate layers similar to the example given in Section 4.3.11. This will allow greater utilization of data as users will be able to display different levels of data for different drawings.</p>

Department	Comments	Response
WSD	<p>Can the CSWD give guidelines on AutoCAD's LTSCALE setting?</p> <p>What layer should AutoCAD XREF's be assigned to when referenced on?</p>	<p>Yes. We would recommend that LTSCALE be defined in paper space. This will allow users to set different values of LTSCALE for different plotting scales.</p> <p>If users are using line styles from ACAD.lin we would recommend that LTSCALE be set to 10xPlot Scale.</p> <p>If users are using line styles from ACADISO.lin we would recommend that LTSCALE be set to 1xPlot Scale.</p> <p>When model files are XREF'ed in AutoCAD they are automatically assigned to the "current" layer. If that "current" layer is then switched off the XREF will also be switched off.</p> <p>To avoid this we would recommend users create an empty XREF layer and assign all XREFS to this empty layer.</p>
Atkins China Ltd	<p>Having reviewed an AutoCAD and a Microstation version of the HyD drawing with all departments model files attached we noted the following problems:</p> <p>Custom line styles did not completely convert between AutoCAD and Microstation and visa versa.</p> <p>Different LTSCALE values had been set in the AutoCAD model files. In the drawing file only one LTSCALE value can be set so this did not correspond to all model files which results in some model file line types displaying incorrectly.</p> <p>In the Microstation drawing file level symbology had been applied to the HyD mapping file H_PBASEMPW to force the line thickness to weight 0 (0.13mm). When converted to AutoCAD level symbology settings are lost.</p>	<p>Corresponding custom line styles in both AutoCAD and Microstation will allow the two to be mapped during the data exchange process.</p> <p>We would recommend that LTSCALE is not defined in model files and that it is left as the default setting (1). LTSCALE should be defined in paper space in the drawing files. This will enable users to set different LTSCALE values for different plot scales.</p> <p>The convention AutoCAD and Microstation use to "temporarily alter" the appearance of data for particular drawings is lost during the data exchange process. The appearance reverts back to the original appearance that the elements were drawn to. The only solution to this is for users to replicate the appearance after conversion.</p>
	<p>The AutoCAD MTEXT command allows users to define a line width, which is then used to automatically divide your text block into separate lines. In certain situations when the text is converted to Microstation the line returns are not exactly the same i.e. Microstation fits more words to a line.</p>	<p>We will discuss this issue with Autodesk and Bentley to see if a solution can be found. We note that where users had placed "hard returns" at the end of each line this problem did not occur. Asking users who are currently used to relying on the software to place "soft returns" at the end of each line to start placing "hard returns" at the end of each line may be impractical even though it solves the problem.</p>

Department	Comments	Response
	Chinese characters display larger in Autocad. Although you define a text height of 2.5mm the actual characters will appear significantly larger.	We will discuss this issue with Autodesk and Bentley to see if a resolution can be found.
	Not all of the Chinese text used on TD's model files displayed correctly.	See previous comment.

4.5. CSWD Trial – Stakeholders

The following stakeholders volunteered to participate in the and to share their knowledge and experience:

- Anthony Ng Architects Limited
- Hong Kong Electric
- Hong Kong Housing Authority
- Kowloon Canton Railway Corporation
- LPT Architects
- Planning Department

These stakeholders were provided with a full set of CSWD resource files and data exchange files, along with a set of the CSWD sample drawings in both AutoCAD and Microstation format.

4.5.1. Anthony Ng Architects Limited [ANA]

The Consultant visited Anthony Ng Architects Limited offices on 12 November 2001 to discuss the CSWD in further detail and to give further explanation as to the purpose of the CSWD, its primary objectives and to explain the standards in greater detail, in particular the CSWD Element Codes.

ANA demonstrated their current solution for storing previous revisions of drawings, which is to copy the model file data live into the drawing file and keep this drawing file as a record copy, whilst continuing to use model files for the current version of the drawing file.

Been a multi-platform practice ANA was particularly interested in the CSWD data exchange process as they are frequently required to convert data between AutoCAD and Microstation.

4.5.2. Hong Kong Electric

Hong Kong Electric showed a very keen interest in the CSWD and had numerous correspondences with the Consultant discussing the CSWD and how it could be made applicable to their work.

In particular, the CSWD element codes were discussed and some practical examples were given of how both the fourth character in the element field and the user definable code could be used to incorporate HKE's current convention for layers. HKE was keen to include the layer colour with in the layer name, enabling users to instantly recognise the layer i.e.

- Low voltage cable shown in blue 6101B
- Medium voltage cable shown in green 6102G
- High voltage cable shown in red 6103R

4.5.3. Hong Kong Housing Authority

The Consultant visited the Hong Kong Housing Authority's offices on 15 November 2001.

HKHA is another major initiator of CAD data in Hong Kong through its housing projects, and is keen to align its CAD standards with the CSWD.

HKHA was aware of the benefits to be gained from having a common standard in Hong Kong and, to this end, has been very positive and open to suggestions with regards to aligning its HD DCB CAD DRAWING Practice Manual to the CSWD. Consultants and contractors working on HKHA projects are currently required to work to this manual.

HKHA took this opportunity to demonstrate its web based drawing management system, which uses the latest web based technology and allows consultants and contractors to interact with the Authority on projects through the sharing of project data across the web.

4.5.4. Kowloon Canton Railway Corporation

Both the KCRC and the MTRCL have both shown a keen interest in the CSWD throughout the course of this study and the Consultant has had a number of correspondences with them.

Both are currently in the process of reviewing their CAD manuals and both Corporations have both shown a strong willingness to grasp this opportunity and set a common CAD standard for Hong Kong by aligning their standards with the CSWD as far as possible.

During the course of the trial KCRC reviewed the CSWD and has provided us with some additional feedback, which is included in Appendix E.

From the outset of the discussions with KCRC and MTRCL, the topic of most concern has been the Microstation working units and global origin settings.

With the release of Microstation Version 8 the working units issue has been resolved as, when referencing files with different working units, V8 will automatically apply a scale factor to the file being referenced to take account of the difference in working units.

Microstation Version 8 also goes some way to resolving the current global origin problems with the introduction of a limitless design plane (working area size), which

means that the default global origin (CSWD global origin) can be used by all, regardless of the working units setting.

If KCRC and MTRCL use the default global origin for their new work then they will be compatible with the CSWD. But the problem of how to handle the Corporations' old data, which is based on a different global origin, would remain. Having discussed this issue with Bentley, a solution appears to be offered through Microstation Version 8. This is described through the following e-mail correspondence.

Email Correspondence from Atkins China Ltd to Bentley regarding global origins and Microstation Version 8:

mt/marin

thanks for the v8 demonstration you gave on 21 november, it was very informative and good to see such improvement and enhancement rather than just a few tweaks here and there. As you are aware I am currently working on a project which involves setting cad standards for the government departments. One of the biggest headaches users currently experience in hong kong with the use of microstation is the fact that the 3 major infrastructure clients (Government, KCRC and MTRC) are using different global origins and working units which makes data sharing and coordination an absolute nightmare.

GOVERNMENT

GLOBAL ORIGIN 2147483.6480,2147483.6480,2147483.6480
WORKING UNITS FOR METRES DRAWINGS master units m
sub units mm
resolution
1000 mm per m
1 pos units per mm

KCRC

GLOBAL ORIGIN -525615.2716,-684396.5804,214748.3648
WORKING UNITS FOR METRES DRAWINGS
master units m
sub units mm
resolution
1000 mm per m
10 pos units per mm

MTRC

GLOBAL ORIGIN -615251.6352,-8000
WORKING UNITS FOR METRES DRAWINGS
master units m
sub units mm
resolution
1000 mm per m
10 pos units per mm

the fact that v8 no longer limits the size of the design plane means that everybody could now use the default microstation global origin (2147483.6480,2147483.6480,2147483.6480).

as you mentioned V8 already has a function for handling the referencing of files with different working units so the fact that different working units are being used does not create any problems.

kcrc and mtrc have both expressed a willingness to adopt the default global origin in future, which would be beneficial to all cad users in hk. However they are understandably concerned with the

impact this would have on their existing data, of which they have vast amounts. If Bentley could include a global origin fixer in V8 which automatically shifts files with different global origins when they are being referenced so that the files being referenced correctly overlay the main file, this will go some way to allaying their concerns and making life for microstation users in hong kong much easier.

Regards

Mark Doel

Reply from Bentley

Hi Mark,

I fully understand where you are coming from and your problems. How does the following sound?

Adding a "Coincident World" option to the reference file attach. This being available whenever attaching between DGN files. The description field could say "Global Origin aligned with Master File".

In the standard Coincident, the design file UORs are aligned. In the new option the global origins are aligned.

For DWG files (either master or reference) the "Coincident World" option would not appear. DWG files do not have Global Origin concept, so this is not required.

What do you think? Sounds good ☺

Please send a copy of each file to me for testing. All goes well, you should see a new MicroStation posted next week with this addition ☺

regards,

Marin

4.5.5. LPT Architects

LPT Architects have shown a keen interest in the CSWD and provided a very thorough set of comments through the HKIA. In addition, the Consultant visited LPT's offices on 13 November 2001 to discuss the CSWD in greater detail and to share their knowledge of CAD.

In addition to CAD standards a number of application issues were discussed, i.e.

- The use of AutoCAD's "PACK N GO" tools to store previous revisions of files.
- The use of Microstation's "ARCHIVE" tools to store previous revisions of files.
- The use of Paper Space and methods of using Paper Space in AutoCAD.
- The use of the AutoCAD and Microstation "BATCH PLOT" tools.
- The advantages to be gained from using OVERLAY as opposed to ATTACHMENT when using AutoCADs XREF tools.

4.5.6. Planning Department

Planning Department was eager to explore how the CSWD could be utilised for their particular work, and this topic was discussed with them at a meeting in their offices on 8 November 2001.

Practical examples of using the CSWD element codes and the flexibility that would be gained through the use of the fourth character in the element field and the use of the user definable field was discussed in particular.

It was noted that Planning Department use a lot of customisation for its CAD work, which although this maximises the use of the CAD software, does create additional problems when exchanging the customised data.

4.6. Overview of Comments Received on the Trials

- 4.6.1. Written comments on the trial, together with the Consultant's responses to them are contained in Appendix H. In general, the comments can be summarised as follows:
- 4.6.2. The most common area of concern amongst respondents was the CSWD Element Codes, in particular the amount of time it would take users to understand the element codes and get up to speed with using them.
- 4.6.3. A number of Departments experienced problems in using the CSWD data exchange settings file and mapping tables.
- 4.6.4. A common request was the inclusion of a project reference in the model file name and increasing the agent field to 3 characters.
- 4.6.5. A number of respondents thought the flexibility of the CSWD would lead to confusion amongst users, although some respondents took the opposite view and suggested that there was not enough flexibility.
- 4.6.6. A number of additions to the standards were suggested which were mainly concerned with the application of CAD and how best to use CAD.
- 4.6.7. A number of questions were raised regarding the CSWD folder structure, in particular the question of adding additional folders.
- 4.6.8. The majority of the feedback was positive and respondents could see the benefits that the CSWD will bring to the SAR's construction industry.

5. CONCLUSIONS, RECOMMENDATIONS AND ACTIONS**5.1. Conclusions**

- 5.1.1. Overall, the Consultation Exercise of the Study on CAD Standards for Works Departments is viewed as being more successful than had been expected.
- 5.1.2. The response from stakeholders wishing to attend the presentations was excellent. The publicity initiatives were effective. The use of the Works Bureau web site provided an easy method of communication.
- 5.1.3. Particularly pleasing was the positive interest and feedback received from other client organisations such as Housing, MTRCL and the KCRC. If these organisations adopt even part of the CSWD it will serve to hasten the establishment of the standards as the 'de facto' CAD standard in Hong Kong.
- 5.1.4. From the analysis of feedback received on the questionnaire, it is concluded that:
- The standards were clearly presented (Average 70% thought so)
 - There was good understanding of the various parts of the standards (Average 80%). However, there is a need to clarify those parts of the standard that are mandatory as opposed to those parts that are recommendations only.
 - The majority of respondents thought that the standards would be either moderately easy to implement or could be implemented 'with some difficulty'. A positive view of this would be that the CSWD will improve standards – if they were too easy to implement then there would be no improvement in CAD standards in the industry. As no-one thought the CSWD would be difficult to implement, then the balance is probably right.
 - Stakeholders view the benefits of the CSWD more positively than participating departments. Over 70% of stakeholders thought there would be major benefits while a similar percentage of participating department members thought the benefits would be moderate. This can be explained by the CSWD providing a unified standard requiring stakeholders to work to a single standard compared to the present situation where they have to work to several. Participating departments generally only have to work to their departmental standard and do not face the same variety of standards; they will naturally view the benefits as being less.
- 5.1.5. A number of useful improvements to the standards were given and those that it is recommended be adopted are given in the section 'Recommendations' below.
- 5.1.6. There are natural concerns over the implementation of the CSWD, although it is considered that, as the trial has demonstrated, once the standards are put to use, users will be quickly able to work to them.
- 5.1.7. The overall conclusion to be made from the CSWD trial is that all Departments made good use of the CSWD, in particular the CSWD element codes.

- 5.1.8. Attention needs to be paid to the data exchange process and clear guidelines need to be produced to assist users in carrying out the data exchange process.
- 5.1.9. Consideration should be given to involving Autodesk and Bentley in the CSWD committee, on an as-needed basis, so that feedback can be provided to them and pressure can be put on them to improve software.
- 5.1.10. Consideration to be given to setting up a notice board on the WB web site as a forum for posting questions, answers and a sharing of knowledge.

5.2. Recommendations

- 5.2.1. As a result of the Consultation Exercise, the following changes to the Preliminary CSWD are recommended:

Proposed Standard	Recommended Change
Folders	Consider renaming ADMIN to CAD_ADMIN Add a folder for organisation-wide files, such as mapping, CSWD\COMMON
File Settings	No change
File Naming	Model Files <ul style="list-style-type: none"> • Increase Agent Responsible to 3 Characters – Develop a list for all participating departments and frequently-participating stakeholders. • Add the Project ID – 8 characters between Agent Responsible and View • Status – Add 'A' As Built • Status – Add 'M' Maintenance • Status – Replace ' W' (Whole Project) with ' W' (All work) • Consider using delimiters in the model file name to separate the various fields
Layer Naming	Increase Agent Responsible to 3 Characters – Develop a list for all participating departments and frequently-participating stakeholders.
Element Coding	Add 128 – Reclamation Add 642 – CCTV Add 647 – Signalling
Layer Assignment	No change
Drawing Settings	Additional guidelines to be provided for AutoCAD's LTSCALE setting and the avoidance of using AutoCAD's "DEFAULT" lineweight.
Plot Settings	Additional guidelines to be provided for plotting with IPLOT and plotting to lazer jet printers.
Application	No Change
System Requirements	Add recommended hardware configuration for WIN 2000 to PIII CPU, 256 MB RAM, 40 GB HDD, 1024x768 display. That previously given remains a recommended <u>Minimum</u> configuration.

- 5.2.2. Once the final standards have been endorsed by the Study's Working Group, the language used to present the standards should be changed from one of "making recommendations" to clearly defining the mandatory requirements of the standards.

5.3. Actions

5.3.1. A number of actions have also arisen as a result of the Consultation Exercise and on-going development:

5.3.2. Transport Department's Chinese Text Font

The Chinese font used by Transport Department for road signs and markings is of a style that meets the requirements of the Roads Ordinance and therefore must be maintained within the CSWD. This will require the provision of the font set in AutoCAD and Microstation format as part of the CSWD standard file set.

Action: TD to confirm the licensing arrangements of the font set and its availability to be included for distribution to CSWD users, including stakeholders.

5.3.3. Microstation Version 8

Microstation Version 8 has been released over the course of the consultation exercise and its supplier, Bentley Systems, has undertaken an intensive exercise in informing users of the facilities available in this new version. Version 8 appears to be an extensive upgrade over previous versions and has several facilities that offer benefits to the CSWD. These include:

- Limitless layers
- Limitless length for cell names
- A limitless design plane. This in effect means that everyone in Hong Kong can now use the default global origin, which has been adopted for the CSWD. (For further information refer to section 4.5.4).
- Enhanced data transfer facilities to and from AutoCAD (V8 is able to read an AutoCAD .DWG file in its native format without the need for conversion; similarly it can write a DWG file). This in effect eliminates data transfer as Microstation Version 8 allows the user to work with both AutoCAD and Microstation files. To test these improvements some of the Departments AutoCAD model files were opened in V8 and then saved them in Microstation *.dgn format. The result was an exact match even for those files with custom line styles.
- The inclusion of a drawing history facility, which enables the tracking of changes made to files and revert back to any version or combination of versions.
- The inclusion of a CAD Standard facility, which enables the definition of CAD Standards and the ability to automatically update to those standards across an entire project or Department.
- The ability to read Chinese fonts in Unicode format.

If the participating departments intend upgrading to V8 in the near future, it would not be necessary for the Works Bureau to procure a Chinese font set in BIG-5 format. The cost of the BIG-5 Chinese font set will be in the order of HK\$500,000.

Action: The Microstation-using departments (CED, DSD, HyD, TDD and TD) to provide their indicative programme for upgrading to Microstation Version 8.

5.3.4. Symbols / line-styles

Following the submission of the Final Working Paper #3, responsibilities for symbols and line-styles are now defined and the development of the initial libraries in Microstation and AutoCAD format can begin.

Action: Works Bureau to instruct Atkins China Ltd to develop the libraries under the direction of the CSWD Committee.

5.3.5. CAD Users Manual

A CAD Users Manual is to be prepared to assist users in the implementation of the CSWD.

Action The Consultant to prepare a proposal for the form and contents of the manual for the Working Group's consideration.

5.3.6. Training

The need for training of users in the standards has been reinforced through the trial.

Action Departments to consider their training needs and prepare necessary training programmes.

APPENDIX A

PUBLICITY ARTICLES

APPENDIX A – PUBLICITY ARTICLES

Common standard set for projects drafting

Huge gains cited in getting all players to work from the same programme

SIGNIFICANT cost savings are possible on public works projects when a new common computer aided drafting (CAD) standard is fully introduced by the middle of next year, according to Atkins China, the consultant spearheading the move.

The new measure will apply to all projects overseen by the Works Bureau from the middle of next year.

Atkins China said substantial cost and time savings are likely because it said the new guideline will improve communication between contractors, consultants and government departments leading to better co-ordination. It will also improve the accuracy of drawings, helping to eliminate any errors.

As a result, "savings will not only come in the drawing office, but also on site, where abortive work and delays due to clashes between services and structures will be greatly reduced. The potential savings here are enormous," the firm said in its consultation document.

This increased co-ordination and collaboration between organisations within the building and civil engineering industries was one of the key recommendations of Henry Tang Ying-yen's construction industry review committee. In the group's *Construct for Excellence* report, submitted to Chief Executive Tung Chee-hwa in January, the committee called for increased use of information technology to increase efficiency and a more integrated approach to the construction process.

Atkins China, with its partner Intergraph Hong Kong, was appointed by the Works Bureau last November to prepare a common CAD standard for both the AutoCad and Microstation systems.

The Works Bureau oversees about 1,400 schemes, involving hundreds of thousands of project designs, at any one time through its seven departments including architectural services, civil engineering, highways and water supplies.

But each of the seven organisations has its own CAD standards used by staff to draw the plans electronically.

In its consultation document, Atkins China said: "Each of the departments has developed its own CAD standards to suit its own needs. As a result, CAD data exchange between the departments is limited



KEITH WALLIS

BUILDING BLOCKS

due to incompatibilities in the data. The same incompatibilities of data and the lack of a common set of CAD standards also prevent easy exchange of electronic drawings between the departments, their consultants, contractors and suppliers."

The exchange of drawings and documents results in loss of data and errors that have to be corrected manually using hardcopy transfers.

The common CAD standard will eliminate these problems, increasing efficiency for contractors, consultants and suppliers.

John Newby, Atkins China divisional director, said: "Better CAD procedures means better information leading to fewer problems on site."

The document was issued yesterday to a raft of government departments and other organisations including the Association of Consulting Engineers, Hong Kong Construction Association and the Hong Kong Institute of Architects.

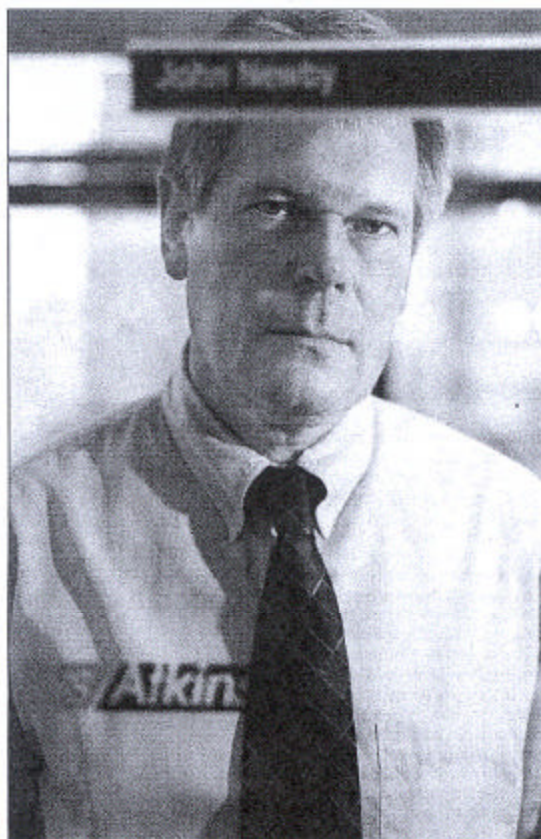
"We do expect a positive reaction. We will be disappointed if that doesn't happen," he said.

Under current plans, a series of presentations will be made at the end of this month to the

seven departments and other groups such as the Federation of Electrical and Mechanical Contractors and the Joint Utilities Planning Group, which includes telephone companies and Hong Kong and China Gas.

Once these have been done, Atkins China will organise a trial involving up to 50 users within government organisations including the Transport Department.

Atkins China said: "The trial will consist of two parts. The first will require users to produce some typical detail drawings to the standards. The second will comprise a data exchange trial, particularly of the Microstation/AutoCad translation,



MATT WRITTLE / Hong Kong Mail

Atkins China's John Newby says better communication resulting from the new guideline will lead to better co-ordination and increased efficiency

whereby some background data will be passed to all participating organisations for the addition of their discipline specific information. This additional data will then be distributed to all participants, who will be asked to combine it into a single drawing. In theory, all of the resulting plots should be identical."

If the trial is successful, implementation of the new standard will begin by the end of this year and should be fully in force by the middle of next year.

The Works Bureau plans to introduce a technical circular making the new standard a contractual requirement in all new projects.

Mr Newby said staff within government departments, contractors and other outside organisations would have to be trained to use the revised guidelines, but this was unlikely to cause serious problems.

In its consultation document,

Atkins China said: "While it is recognised that there will be a time and cost penalty in users familiarising themselves, once this initial hurdle is overcome then significant benefits will accrue. Users will not have to learn new standards for each government project on which they work. Should CAD operators move between government departments or other organisations then retraining will not be required."

Mr Newby said the creation of the new CAD standard is part of the government's move towards electronic tendering. Accurate drawings will also make it easier and more efficient to maintain the structure or building once it is completed.

Mr Newby said a committee would oversee the implementation and make any changes to the new standards to accommodate new versions of software.

keithw@hk-mail.com

Skyline Morning Briefing Article – 11 October 2001

If you have any problems reading this email, it is available at

http://www.skyline-technologies.com/briefings/1001/briefings_111001.htm.

Contact us if you have any problems or comments.

Two Intro's for the price of one.

Works Bureau CAD Standard Study – Consultation Exercise.

Works Bureau has been carrying out a study to align the CAD standards used in the Works Departments, including Architectural Services Department, Civil Engineering Department, Drainage Services Department, E&M Services Department, Highways Department, Territory Development Department and Water Supplies Department. The result is a series of standards for use in Microstation and AutoCAD that, not only will the Works Departments use internally, but will become a contractual requirement for those organisations that produce drawings for public works projects.

The views on the proposed standards from organisations that will be affected, (consultants, contractors, suppliers etc) are now being sought. A Consultation Document is available and is being distributed to construction industry representative bodies. Copies can also be obtained by e-mailing jnewby@atkins-china.com.hk or visiting the Works Bureau web site at <http://www.wb.gov.hk/gov>.

A series of presentations of the standards will be held in the week beginning 30th October 2001. Those that wish to attend should contact John Newby at the e-mail address above, or MT Tsim of the Works Bureau at mt.tsim@wb.gov.hk.

If any or all of the above is as clear as mud, then contact us at SKYLINE and we'll see whether we can throw additional light on the subject.

: 2855 7027 or e-mail leslla@netvigator.com.

APPENDIX B

LIST OF STAKEHOLDERS ATTENDING THE PRESENTATIONS

APPENDIX B – LIST OF STAKEHOLDERS ATTENDING THE PRESENTATIONS

Organisation
Anthony Ng Architects Ltd
Arthur CS Kwok Architects & Associates Ltd
ATAL Engineering Ltd
Au Posford Consultants Ltd
Autodesk Far East Ltd
Binnie Black & Veatch
Cable TV
Cheluen Electrical Engineering Co Ltd
Chevalier (HK) Ltd
Chun Wo Construction & Engineering Co Ltd
CLP Power Hong Kong Ltd
Dickson Construction
Far East Consultant Engineers Ltd
Gammon Construction Ltd
Gold Ram Engineering & Development Ltd
Halcrow China Ltd
High-Point Rendel
Ho Wang SPB Ltd
Hong Kong Construction Holding Ltd
Hong Kong Housing Authority
Hong Kong Institute Architects
Housing Department
IASPEC Technologies Limited
i-cable
KML Engineering Ltd
Kowloon Canton Railway Corporation
Leigh & Orange
Ling Chan & Partners Ltd (HKIA)
LPT Architects Ltd
Maunsell Consultants Asia Ltd
Maurice Lee & Associates Ltd
Meco Engineering Ltd
Montgomery Watson Harza


Organisation
Mott Connell Ltd
MTR Corporation
MVA Hong Kong Limited
New World Telephone Limited
Nishi Matsu
Ove Arup & Partners Hong Kong Ltd
Parsons Brinkerhoff (Asia) Ltd
PCCW – HKT Telephone (JUPG)
PCCW-HKT Telephone
Planning Department / TS
Quattros Byad Consultant Ltd
Robert Benaim & Associates (Asia) Limited
Rocco Design Ltd
Ryoden Elevator Co Ltd
Ryoden Engineering Co Ltd
Shan On Engineering Co Ltd
Shun Hing Engineering Contracting Co Ltd
Shun Lee (China) Development Co Ltd
Sui Chong Construction Engineer Co Ltd
The Express Builders Co Ltd
The Hong Kong Construction Association
The Precast Piling & Engineering Co Ltd
Town Gas
Trane HK (HKE&MC)
United Construction Co Ltd
Wai Lee Design Architects Ltd
Wecon Limited
Wilbur Smith Associates Limited
Wong & Cheng Consulting Engineers Ltd
Yau Lee Construction Co Ltd

APPENDIX C

PRESENTATION SLIDES

APPENDIX C – PRESENTATION SLIDES

Agreement No CE15/2000
Study on CAD Standard for Works Departments



Consultation Presentation to Stakeholders

WS/Atkins

Agenda

- Purpose of the CSWD
- Benefits of the CSWD
- Purpose of the Consultation
- Implementation Programme
- The Standards
- Demonstration
- Questions and Answers

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Atkins China Ltd

WS/Atkins

Intergraph HK Limited

Purpose of the CSWD



Movie Clip

- To align the Works Departments' CAD standards into ONE
- To set CAD standards that will facilitate CAD data exchange
- To standardise drawing settings and resources files
- To facilitate the management of CAD data
- To improve drawing production efficiency
- To make administrative arrangements for updating the standards

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Benefits of the CSWD

- One common CAD standard for all departments
- One common CAD standard for departments' consultants, contractors and suppliers
- Likely to be adopted as the "de-facto" CAD standard for the Hong Kong Construction Industry
- Improved data exchange
- Better co-ordination
- Increased usage of CAD data
- Improved efficiency

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Benefits of the CSWD

To make your life easier !

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supported by Intergraph HK Limited

WS/Atkins

Purpose of Consultation

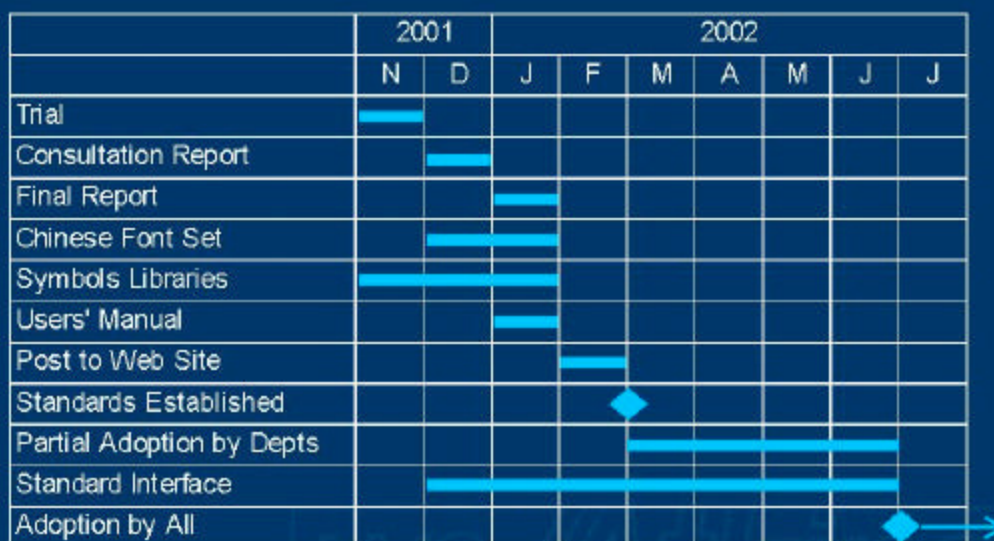
- To introduce the CSWD
- To secure support for the CSWD
- To obtain feedback on the CSWD

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Implementation Programme



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CAD Principles

- Maximum use of Model Files
- Avoid Copying Data
- Clear ownership and responsibility

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The Standards

The CSWD are based on BS 1192-5:1998 Construction Drawing Practice and on Departments current standards

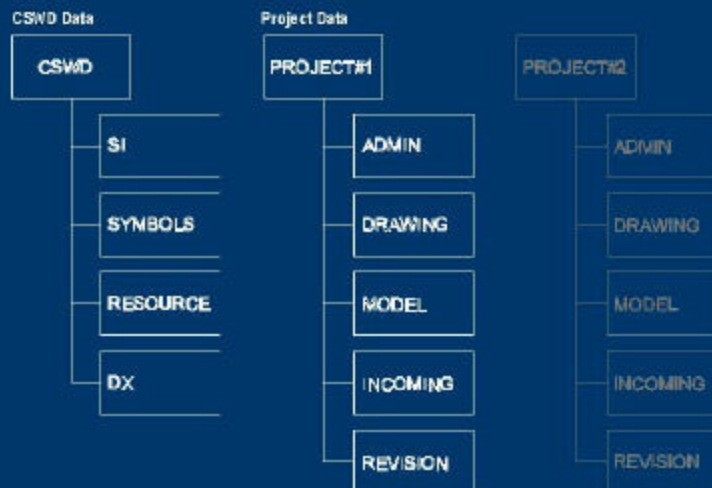
- Folders
- File Settings
- File Naming
- Element Coding
- Layer Naming
- Layer Assignment
- Drawing Settings
- Plot Settings
- Guidelines
- Special Characters
- Drawing Symbols

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Folders



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File Settings

	AutoCAD	Microstation
File Type 2D/3D	Not Applicable	3D Microstation Design Files to be used (to avoid incompatibility between 3D and 2D files)
Units	Either Metres or Millimetres dependent on type of drawing	Either Metres or Millimetres (dependent on type of drawing)
Working Units	Not Applicable	Metres Drawings: Master Units m Sub Units mm Sub Units/Master Units 1000 Positional Units/Sub Units 1 Millimetres Drawings: Master Units mm Sub Units - Sub Units/Master Units 1 Positional Units/Sub Units 1000
Global Origin	Not Applicable	Default Global Origin X 2,147,483,648 Y 2,147,483,648 Z 2,147,483,648

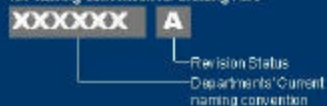
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File Naming

File Naming Convention for Drawing Files



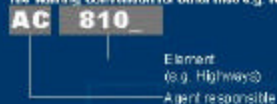
File Naming Convention for Model Files



File Naming Convention for previous revisions of Model Files (Stored in Revision Directory)



File Naming Convention for other files e.g. Resource Files and Cell Libraries



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File Naming

File Naming Convention for Hsdi Files
AC P HWAYHA N


— Status
 — File / Reference
 — View
 — Agent responsible

Field	Characters	Recommended character codes
Agent responsible	2 (alphanumeric)	A_ = ArchSD AB B_ = ArchSD BSB C_ = CSD D_ = DSD E_ = ESD H_ = HyD M_ = TSD S_ = ArchSD SB T_ = TD W_ = WSD Consultants, Contractors, Suppliers to be assigned unique 2 character codes
Element	4 (numeric)	Based on the CSWD Element Coding Tables
File / Reference	6 (alphanumeric)	User definable reference
Status	1 (alphabetic)	N = new work E = existing to remain R = remove T = temporary work W = whole project
View	1 (alphabetic)	D = detail I = isometric P = plan S = section E = elevation

Note: Underscore characters should be used to represent emphasised characters

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Element Coding

- Element coding provides a means categorising of CAD data and applying intelligence to CAD data
- Element coding can be used for:
 - Layers
 - symbol libraries
- The CSWD Element Coding System is based on the international CI/SfB coding system

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Use of Element Coding

- The CSWD Element coding provides a flexible means of categorising CAD data:

Example 1 - Group by main Class	
950_	can be used for all marine works elements.
Example 2 - Group by Class	
953_	breakwater
955_	floating jetty
956_	seawalls
Example 3 - Group by Sub Class	
9561	block work seawalls
9562	wave absorbing seawalls
9563	rock-faced sloping seawalls

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Layer Naming

Layer Naming Convention		
AC	950_	X
		— User definable
		— Element
		— Agent responsible
Layer Field	Characters	Recommended Character Codes
Agent responsible	2 (alphanumeric)	A_ = Archd AB B_ = Archd BSB C_ = CED D_ = DSD E_ = EMSD H_ = HyD M_ = TDD S_ = Archd SB T_ = TD W_ = WSD Consultants, Contractors, Suppliers to be assigned unique 2 character names
Element	4 (numeric)	Based on the CSWD Element Coding Tables
User definable	1 (alphanumeric)	User definable alphanumeric character.
Note: Underscore characters should be used to represent empty/unused characters		

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WS/Atkins

Examples of Layer Naming

AC 953_ _ Breakwater

AC 9561 _ Block work seawalls

AC 9562 _ Wave absorbing seawalls

AC 956_ 1 Seawall - Phase 1

AC 956_ 2 Seawall - Phase 2

AC 956_ A Seawall - Option A

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Layer Assignment

AutoCAD	Microstation
AutoCAD layer assignment will follow the common convention of creating the relevant layers as and when they are required in accordance with the CSWD.	Microstation levels shall be assigned layer names using the CSWD layer naming convention. Each layer name should be assigned to a separate level number e.g. Level 1 AC 810_ A Level 2 AC 820_ A Level 3 AC 830_ A The CSWD will not utilise the level number assignment function. If users have a level assignment system in place then this can be maintained. If not, then it is recommended that layers are assigned numbers in the order in which they are created e.g. Level 1 First layer created Level 2 Second layer created Level 3 Third layer created
No more than 63 layer names should be used per file (until this restriction in Microstation is removed in future versions)	No more than 63 layer names should be used per file (until this restriction in Microstation is removed in future versions)

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Layer Assignment

Automatic Layer Assignment can be achieved using:

- AutoCAD Template Files with CSWD Layer Names
- Microstation Level Tables with CSWD Layer Names

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Drawing Settings

Lines	AutoCAD	Microstation
Line Thicknesses	0.13mm 0.15mm 0.25mm 0.35mm 0.50mm 0.70mm 1.00mm 2.00mm	0.13mm 0.15mm 0.25mm 0.35mm 0.50mm 0.70mm 1.00mm 2.00mm
Line Thickness Assignment	It is recommended that line thickness is assigned by weight and not by colour. The recommended CSWD line thickness can be selected from the standard AutoCAD line weight settings dialog box.	It is recommended that line thickness is assigned by weight and not by colour. Weight 0 = 0.13mm Weight 1 = 0.15mm Weight 2 = 0.25mm Weight 3 = 0.35mm Weight 4 = 0.50mm Weight 5 = 0.70mm Weight 6 = 1.00mm Weight 7 = 2.00mm
Colour Tables		
Colour Table	The use of the default AutoCAD colour table is recommended.	The addition of five grey scales to the default Microstation colour table is recommended. This will enable the AutoCAD and Microstation grey scales to be matched.

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Drawing Settings

Fonts	AutoCAD	Microstation
Standard English Font for Working Drawings	Romans Font	Font 3 (Engineering)
Standard Width Factor for English Text	0.80	0.80x Text Height
Standard Chinese Font for Working Drawings	<p>A CSWD MING font will be created. It will:</p> <ul style="list-style-type: none"> contain Standard Big-5 and HKSCS characters. Initially be to Big-5 coding scheme. (Unicode version to be used once supported by Microstation) Allow input by Chiang Jui and Quick method. 	<p>A CSWD MING font will be created. It will:</p> <ul style="list-style-type: none"> contain Standard Big-5 and HKSCS characters. Initially be to Big-5 coding scheme. (Unicode version to be used once supported by Microstation) Allow input by Chiang Jui and Quick method.
Standard Width Factor for Chinese Text	1.0	1.0 x Text Height

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Plot Settings

Paper Size	AutoCAD	Microstation
	Format	Size (mm)
	A0	841x1189
	A1	594x841
	A2	420x594
	A3	297x420
	A4	210x297
	A5	148x210
	B1	707x1000
	* The use of B1 should be kept to a minimum as it exceeds the most common plot size of most plotters.	
Line Thickness	AutoCAD	Microstation
	0.10mm	Weight 0 = 0.10mm
	0.15mm	Weight 1 = 0.15mm
	0.25mm	Weight 2 = 0.25mm
	0.35mm	Weight 3 = 0.35mm
	0.50mm	Weight 4 = 0.50mm
	0.70mm	Weight 5 = 0.70mm
	1.00mm	Weight 6 = 1.00mm
	2.00mm	Weight 7 = 2.00mm
Grey Scales	AutoCAD	Microstation
	<p>The default AutoCAD grey scales: Colors 0, 9, 240, 255, 255, 255, 255 and 255 are not as grey scales.</p> <p>It is recommended that only colors 250, 254 are different as grey scales under the CSWD.</p>	<p>The following colors will plot as grey scales: 0, 9, 14, 240, 255, 255, 255, 255.</p> <p>It is recommended that only colors 250, 254 are different as grey scales under the CSWD.</p>

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Guidelines

Drawing Scales

- Scales should be whole number
- Odd scales should be avoided
- The number of scales on any one drawing should be kept to a minimum
- The scale shall be clearly identified under the title of each portion of the drawing
- The scale chosen shall be large enough to permit clear and easy interpretation of the information
- Where different scales are used for horizontal and vertical dimensions, such as on profiles, each scale shall be clearly indicated.

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Guidelines

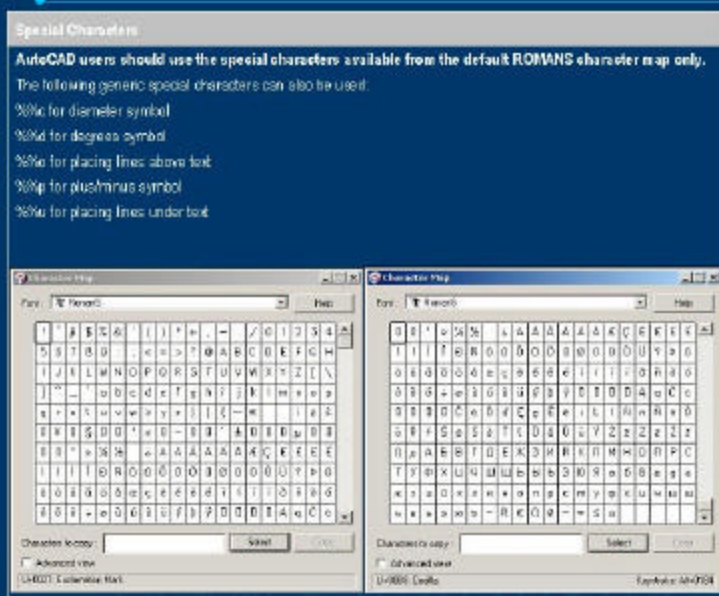
English Text Sizes		
Text Height (mm)	Width Factor	Thickness (mm)
2.00mm	0.80	0.25mm
2.50mm	0.80	0.25mm
3.50mm	0.80	0.35mm
5.00mm	0.80	0.50mm
7.00mm	0.80	0.70mm
10.00mm	0.80	1.00mm
20.00mm	0.80	2.00mm
Chinese Text Sizes		
Text Height (mm)	Width Factor	Thickness (mm)
3.00mm	1.00	0.25mm
3.75mm	1.00	0.25mm
5.25mm	1.00	0.35mm
7.50mm	1.00	0.50mm
10.50mm	1.00	0.70mm
15.00mm	1.00	1.00mm
30.00mm	1.00	2.00mm

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Special Characters - AutoCAD

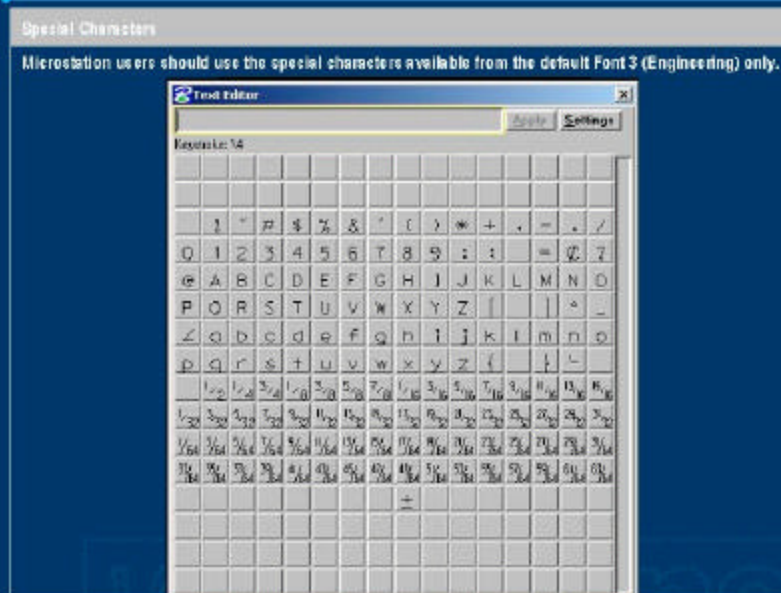


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Special Characters - Microstation



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Drawing Symbols

- Departments drawing symbols have been rationalised
- Rationalised drawing symbols have been added to database
- AutoCAD and Microstation versions of each symbol to be created
- Symbols to be categorised according to the CSWD Element Coding Tables e.g.
 - 950-959 Marine Works Drawing Symbols
 - 960-969 Marine Furniture Drawing Symbols

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APPENDIX D

FEEDBACK QUESTIONNAIRE

APPENDIX D – FEEDBACK QUESTIONNAIRE



The Government of the Hong Kong
Special Administrative Region
WORKS BUREAU

Study on CAD Standard
for Works Departments

FEEDBACK QUESTIONNAIRE

Thank you for attending our presentation or visiting our web site. We'd appreciate you spending a few minutes to give us your feedback by completing this form. You may use additional sheets if you have other comments or suggestions that do not fit into this questionnaire. Please either fax a hard copy to 2895 1580 or e-mail a soft copy to joyce@atkins-china.com.hk.

Name:	<input type="text"/>	Company:	<input type="text"/>
Fax No.:	<input type="text"/>	e-mail:	<input type="text"/>
CAD system used :	AutoCAD / Microstation / Both / Other (please specify)		<input type="text"/>

1. Are the proposed standards clearly presented?

<input type="checkbox"/> Yes	Comment
<input type="checkbox"/> Could be clearer	
<input type="checkbox"/> No	

2. Do you understand the proposed standards?

	Yes	Partly	No	Comment
Folders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
File Naming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
File Settings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Layer Naming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Layer Assignment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Drawing Settings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Plot Settings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



The Government of the Hong Kong
Special Administrative Region
WORKS BUREAU

Study on CAD Standard for Works Departments

3. Do you think it will be easy to work to the standards?

Easy	Moderately Easy	With Some Difficulty	Difficult
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments :			

4. Are there any changes to the proposed standards that you would suggest?

Please describe :

5. Do you think that the CSWD will bring benefits to the Construction Industry in Hong Kong?

<input type="checkbox"/> Major Benefits	Comments
<input type="checkbox"/> Moderate Benefits	
<input type="checkbox"/> A Few Benefits	
<input type="checkbox"/> No Benefits	

APPENDIX E

RESPONSES TO COMMENTS ARISING FROM THE PRESENTATION

APPENDIX E – RESPONSES TO COMMENTS ARISING FROM THE PRESENTATIONS

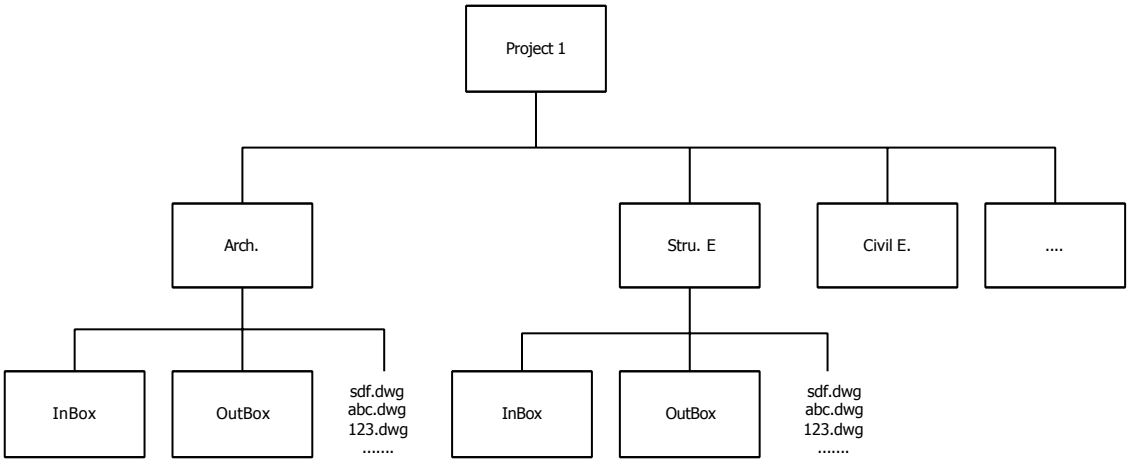
Question 1 – Are the proposed standards clearly presented?

From	Comments	Responses
HyD/Lighting (Woo Kwok Yuen)	More examples with special cases should be illustrated.	There would be an opportunity to add more examples in the proposed CAD Users' Manual.
HyD/MWPMO (L Y Leung)	From Microstation drawing export to AutoCAD drawing, line weight is not same original drawing after conversion.	The live data exchange process demonstrated during the presentation read the default Microstation line-weight mapping table in error, rather than the CSWD line-weight mapping table. The CSWD line-weight mapping tables will convert Microstation line-weights to AutoCAD line-weights.
HyD/MWPMO (Yeung Yau Wah)	No example has been shown for readers to understand the CSWD is actually functioned. How to ensure the drawings' data is completely exchanged from "Microstation" format to "AutoCAD" format or vice versa?	Time limitations did not allow a very detailed examination of data exchange, but it has been thoroughly examined as the main part of the trial as discussed in this report.
HyD/HK Region (Kwan Suk Mei)	Only an outline is presented.	The main principles of the CSWD were given in the Consultation Document and in the presentations; too much detail at this stage would be confusing. There is an opportunity to give more detail as to how to use the standards in the CSWD Users' Manual.
SP/GEO/CED (C K Tse)	The presentation can be more detailed to show how to use the new standard.	We did not want to make the presentations too long or detailed as there is a limit as to how much attendees can take in at a single session. There is an opportunity to give more detail as to how to use the standards in the CSWD Users' Manual.
Ryoden Engineering Co Ltd (William Poon)	I think I can capture more if the speaker can be presented in Cantonese.	Some sessions were conducted in Cantonese and, on reflection, we should have done more in this way. We can only apologise and learn this lesson for the future.
Ryoden Engineering Co Ltd (Chiu KS)	If feasible please send us a copy of the ACAD/Microstation files that you have shown us during the presentation.	The files are available for download from the Works Bureau web site www.wb.gov.hk/gov
KCRC (Wai Ka Keung)	Are all the standards of symbol libraries, seed files, templates, Chinese fonts, manuals, constantly updated on web-site and freely downloaded for use? My section is Railway Signalling and Communication, what is the suitable element coding to use?	Yes, all these resources will be freely available on the CSWD web site. We would suggest 640 – 649 Communications. We will add 647 for Signalling.
PD (Paulina Kwan)	More real examples operated under both Microstation and AutoCAD should be used to demonstrate application of the proposed standards.	As the response above, we did not want to "overload" attendees at the presentation. The trials of the CSWD have allowed more hands-on experience to be gained.

From	Comments	Responses
HyD (Railway) (Yuen-yi Woo)	Use more computers for presentation to simulate the actual environment will be better, so that we can compare the result of data exchange in different CAD system easily.	Data exchange was better addressed under the trial, which involved real users and actual data.
HyD (Railway) (Yuen-yi Woo)	Sample printout should be provided.	Noted. More data on actual drawings is included in this report. The demonstration drawings can be downloaded from the Works Bureau web site and plotted.

Question 2 – Do you understand the proposed standards?

Standard	From	Comments	Responses
Folders	HyD/TMCA (Chan Chak Hoi)	I think that the Commonly used model files will appear at different project's model folder such as basic map, which will reduce the space in server. Could you map the Network drive or create commonly model folder which will store commonly used model files	Agreed, that a common area could be provided for mapping and other commonly used model files e.g. CSWD\COMMON A recommendation will be added to the CSWD
	HyD/HK (Fung Kam Wing)	The folder structure is only for project-based drawings. How about the stand-alone drawings?	Standard and non-project drawings should be held in a separate, appropriately named folder, such as "CSWD\COMMON", and further divided into sub-folders as appropriate.
	HyD/MWPM O (L Y Leung)	Can I add any subfolder of each, e.g. date, nature plot file.	Yes, users are free to add other folders to help organise their projects.
	Ryoden Engineering Co Ltd (William Poon)	I am not clear about the "mapping" folder during the presentations.	The 'mapping' folder was an example of adding other folders as described above. As the mapping was a specific set of data that would be unlikely to change during the project's life, it was convenient to separate it from the other model files.
	Housing Department, D&C Branch (Alex Ho)	1.1 HD has its own Drawing Management System (DMS) mainly on AutoCAD.	Noted.
	Housing Department, D&C Branch (Alex Ho)	1.2 HD has its own filing structure in web-based DMS and the structure cannot modify by CAD users.	Noted.
	Housing Department, D&C Branch (Alex Ho)	1.3 According to the definition of Consultation Document, the "Drawing" and "Model" combine in one filing system.	Yes, although it is considered good practice to separate drawings and model files, it is acceptable to combine them, particularly if this is necessary under a DMS.
	Housing Department, D&C Branch (Alex Ho)	1.4 "Incoming" and "Outgoing" in DMS is shown on the figure below.	Your DMS is obviously well established and, if it works for you, we would not suggest changing it. The structure that you show suits multi-disciplinary working and would enable interface with other parties through the "inbox" directories.

Standard	From	Comments	Responses
<p>Existing DMS File Structure of DMS :</p>  <pre> graph TD P1[Project 1] --> Arch[Arch.] P1 --> StruE[Stru. E] P1 --> CivilE[Civil E.] P1 --> Dots[....] Arch --> ArchInBox[InBox] Arch --> ArchOutBox[OutBox] Arch --> ArchFiles[sdf.dwg
abc.dwg
123.dwg
.....] StruE --> StruEInBox[InBox] StruE --> StruEOutBox[OutBox] StruE --> StruEFiles[sdf.dwg
abc.dwg
123.dwg
.....] </pre>			
File Naming	HyD/MWPM O (L Y Leung)	I think the file ID reference is not clear.	The file ID reference should describe the work that is contained within the file. There are no strict rules for this and users are free to decide what reference best suits the data held in a file.
	HyD/MWPM O (Yeung Yau Wah)	The “Status” of a drawing is needed, but the use of this field must have the same characteristic, as stated the “N= new work” & “W= whole project” no direct relationship can be seen. For example, how to define for a drawing which is temporary work for whole project?	Agreed that “whole project” is a different form of categorisation to “temporary work” . We will re-examine the use of “W” whole project.
	Ryoden Engineering Co Ltd (Leung Kin Man)	On screen example illegible.	Apologies. We suggest that you download the sample drawings from the Works Bureau web site, which will enable you to examine them at your leisure.
	KCRC (Wai Ka Keung)	My company has its own standard of naming drawing.	The KCRC has provided very positive feedback on the CSWD. We do hope that the Corporation will consider adopting the standards for its future work. We believe there will be benefits to the Corporation if it does so, even though there is generally not a contractual arrangement with Government on KCRC projects.
	PD (Paulina Kwan)	Although Microstation V8 would have function to deal with versioning, a systematic methodology should be proposed to manage the files more efficiently.	Agreed. It will first be necessary to determine how quickly each participating department will upgrade to V8, which appears to have many good, new features.
	Housing Department, D&C Branch (Alex Ho)	Propose Agent Responsible field to have three spaces, first two represent Department, say HA; and the third one apply “Disciplines” within that Department.	Agreed – the Agent Responsible field will be increased to 3 characters.

Standard	From	Comments	Responses
	Housing Department, D&C Branch (Alex Ho)	Existing HD practice had 25 characters for file name. So that in order to fit in the system, ID reference field to have more spaces say 8 (alphanumeric).	There has been a large demand to have the project ID added to model file names and we will concede to this. Your use of 8 characters for the file ID reference is noted. It has also been suggested to use delimiting characters, as long names are difficult to recognise; this will also be considered.
	Housing Department, D&C Branch (Alex Ho)	“Project” field to be added in between the field “Agent responsible” and “view”.	Noted and agreed.
	Housing Department, D&C Branch (Alex Ho)	Refer Drawing Practice Manual Section 4.	Noted.
File Settings	HyD/Lighting (Woo Kwok Yuen)	Only Microstation file settings were presented. AutoCAD file settings have not been mentioned.	Our apologies – the HyD presentation concentrated on Microstation as that is the department's principal CAD system
	HyD/MWPM O (Yeung Yau Wah)	What is the AutoCAD's “Default Settings”? The “Working Unit” and “Global Origin” must be clearly defined and stated to standardize the settings.	When AutoCAD is first started, a file DRAWING1.dwg is automatically created allowing users to start work immediately – this is what is meant by “Default Settings”. AutoCAD does not have a Working Unit and Global Origin, which is why it is not defined in the CSWD.
	KCRC (Wai Ka Keung)	Is there any multi-media files on web site showing how to set up these standard?	Not as yet at this consultation stage, but this is a good idea for when the final standards are placed on the web site for use.
	Housing Department, D&C Branch (Alex Ho)	Default setting is acceptable.	Noted, this demonstrates the commonality between the CSWD and current CAD standards used within the industry.
Layer Naming	HyD/MWPM O (Yeung Yau Wah)	The “User definable” field is too flexible, which is difficult for other users to understand the meaning, which represented.	We believe that there has to be a lot of flexibility as it would be impossible to predict all the cases of division of similar layers for all projects. Users may need to spend a little time examining the data contained within layers to understand how the user definable field has been used.
	Housing Department, D&C Branch (Alex Ho)	Layer convention comments same as file naming convention. Agent responsible – 3 characters, elements – 4 characters, user define – N/A.	Noted – 3 character agent name will be adopted.
	HyD (Railway) (Yuen-yi Woo)	Please, check typing error in working paper No. 4B page A-11 element no.	We cannot find any spelling mistakes on that page.

Standard	From	Comments	Responses
Layer Assignment	HyD/MWPM O (Yeung Yau Wah)	As the example stated, same element type will appear at different layers, then how to ensure the data exchange can be done correctly when using mapping files?	The data exchange process will map layers irrespective of the data within them. If element types repeat in different areas of the coding table, then some will be removed. Please advise when this situation occurs.
	Ove Arup & Partners (David Lai)	Too many layer naming will cause frustration.	The standards are flexible; users can use as many or as few layers as suits the data.
	Housing Department, D&C Branch (Alex Ho)	Default setting is acceptable.	Noted, this demonstrates the commonality between the CSWD and current CAD standards used within the industry.
Drawing Settings	HyD/MWPM O (Yeung Yau Wah)	The setting of Color Table must be clearly defined and stated. The term “default” is depending what will be chose as the default setting by individual users.	AutoCAD is supplied with one colour table – the CSWD refers to this as the default colour table. This colour table is attached automatically to all AutoCAD files so users do not have a choice of colour tables. Microstation users will use the CSWD colour table attached to the two CSWD Seed Files (cswd_m.dgn and cswd_mm.dgn), which will be supplied to the users.
	Housing Department, D&C Branch (Alex Ho)	Round up the odd figures such as 0.13mm to 0.1mm and 0.18mm to 0.2mm etc.	This is an interesting point as many of the line thicknesses in use in the participating departments and in the industry as a whole are historical and go back to manual drafting days. It is good to question them and their validity in the age of CAD and plotters. However, they are also ISO standard line weights and, as the Study Brief requires us to work as much as possible to international standards we are reluctant to change them at this stage. 0.13mm is not an ISO standard and was added at the request of departments. We are concerned that this size is already very thin and could become illegible if plotted at reduced size. Rounding the size down to 0.1 would exacerbate the problem. This is a good suggestion but we would like to put it on the back burner for now.

Standard	From	Comments	Responses
	Housing Department, D&C Branch (Alex Ho)	Different types of font files / types to be provided.	The CSWD recommends the use of one font only for all working drawings to simplify the data exchange process and to introduce a degree of consistency to all working drawings. It is felt that additional font types are not necessary for working drawings. It is appreciated that a wider range of font types is required for presentation drawings and therefore it is recommended that the CSWD are not applied to presentation drawings.
	Housing Department, D&C Branch (Alex Ho)	Text Height to be clarified.	The CSWD provides a range of text heights from 2.0mm to 20.0mm. The choice of which text height to use is left to the individual users to apply common sense and good drawing practice.
	Housing Department, D&C Branch (Alex Ho)	Chinese character coding is Big-5 but should clarify font files / types.	It has now been confirmed that the font type will be MING.
Plot Settings	Housing Department, D&C Branch (Alex Ho)	Round up the odd figures such as 0.13 mm to 0.1 mm and 0.18 mm to 0.2 mm etc.	Please see response to similar comment under “Drawing Settings” above.
	Housing Department, D&C Branch (Alex Ho)	We can understand the application of “Grey Scale” .	The addition of five grey scales to the default Microstation colour table is recommended so as to match the AutoCAD grey scales. The corresponding grey scales can then be mapped when exchanging files from Microstation to AutoCAD and vice versa.
Application	Housing Department, D&C Branch (Alex Ho)	Default setting is acceptable.	Noted, this demonstrates the commonality between the CSWD and current CAD standards used within the industry.

Question 3 – Do you think it will be easy to work to the standards?

From	Comment	Response
HyD/Lighting (Woo Kwok Yuen)	Drawings are complicated, not easy to be separated into layers. The application is very different from current practice – not as the study says – only little modification of current practice is needed.	<p>We hope that when you use the standards and get used to them, you will find them to be quite simple in practice. Most departments' current practices are in line with the proposed standards.</p> <p>We would anticipate that for highways lighting, you would generally receive the highways background from other sources. You would then need to create one model file and in that to have maybe one or two layers (element code 634 – street lighting). Your numbered drawings would combine the background and lighting files.</p>
TD (Lam Wing Fat)	The standard is very suitable for big project Drawings. We can separate the whole project into many reference files then various current drawings can use the same reference file, but I believe it will become more complicated if apply on smaller project or on only one presentation Drawing.	<p>The standards can be applied very simply to small projects. Drawings can be held in one file and on one layer within that file, if that is what suits the situation.</p> <p>The standards do not apply to presentation drawings – this will be made clearer in future reports.</p>
HyD/TMCA (Chan Chak Hoi)	When the studies are finalised, further training for more or all relevant staff will be necessary in future.	Noted – training should be given on a departmental basis.
HyD/MWPMO (Yeung Yau Wah)	<p>The workload of preparing project drawings will be increased, starting from naming the model files, assigning the name for level layer, putting the data correspondingly to the assigned layer. More time will be spent on checking all these work to ensure the correctness.</p> <p>Are there any efficient tools that will be provided for the users in checking the drawings to suit for the "CSWD" standard?</p>	<p>But names must be given to model files and layers anyway – it is just a matter of naming in accordance with the CSWD, which, once users are familiar with, should not take any longer than at present. There need not be any more layers in the files than there are at present if proper structuring of the drawing is taking place. Better structuring of drawings will bring benefits of re-use later, which will save time.</p> <p>Commercial packages are available that will check a drawing's structure against a set of standards. These packages were discussed in the Working Paper 3B.</p>
HyD/HK Region (Kwan Suk Mei)	The standards may not be suitable for all types of drawings.	We believe that the standards can be adopted to suit all types of drawings but we would be pleased to examine any specific cases and make recommendations.
Ove Arup & Partners (David Lai)	The CAD draughtsman could take more time to revise the reference attachment for each revision added on each reference files, if the drawing file contains many reference files. This is quite time consuming.	<p>It is not proposed that revisions be added to 'live' model files. In fact, it is strongly recommended that they are not.</p> <p>It is only suggested that a revision be added to copies of old model files at milestones or other archiving events.</p>

From	Comment	Response
KCRC (Liu Ghung Ming)	After a period of adjustment the only difficulty is administrative (getting the organisation to adopt) not technical.	This is a very good point. Organisations will need to be committed to implementing the standards. In those that have a contractual obligation to use them, this should not be difficult. In others that do not have such an obligation, the commitment may be harder to generate. But it is hoped that the benefits that will be gained will be enough to gain that commitment.
Ryoden Engineering Co Ltd (Leung Kin Man)	Great effort is required to manage the CAD data e.g. file naming, layer assignment & element coding etc.	We respond to these two comments together. There will obviously be a learning curve in implementing the CSWD but, in line with the second comment, once established, we believe the on-going use of the standards will be simple.
Ryoden Engineering Co Ltd (William Poon)	Moderately Easy – should become smooth after the adoption period. With Some difficulty or difficult – at the commencing time.	Most companies tend to address specific areas of construction and drawings are often similar, even if they are for different projects. Operators will quickly become used to the coding of their areas of work.
Ryoden Engineering Co Ltd (Chiu Kwok Sui)	Our project mainly rely on incoming drawings from Client / Governmental Department / Consultant, we can only work to the standard if the incoming drawings work to the standard too.	Agreed. The standard will be adopted for new projects by Government and its consultants.
Ryoden Engineering Co Ltd (Chiu Kwok Sui)	For some small project or project without incoming drawing (improvement work for existing system), work to this standard definitely will increase our workload.	We are not convinced that workload will be increased as the CSWD are very flexible and can be adopted to suit a variety of situations. Whatever standards are used, folders, files and layers have to be named. The CSWD merely set what those names should be.
KCRC (Wai Ka Keung)	It would take a lot of manpower & support from the company to convert all the as-built drawings to follow the standards. Also it depends on how well the support and help is provided from the Works Departments. Without the strong support and free availability of the standard files, it would be difficult to work to the standards.	It is not recommended that existing drawings are converted to the CSWD unless they are going to be used and modified for new projects. The Works Bureau and Departments will provide strong support through the CSWD Committee. All standard files will be made available through the Works Bureau web site.
PD (Leung Sik Cheong)	We need to create macros in Microstation to change our customised lines to internal line code of standard width.	Noted – it is advisable to use custom line styles in moderation as they can cause problems during data exchange. We would recommend using default line styles with thick line weights to achieve thick lines rather than using custom line styles with a solid fill, which is Planning Department's current practice.
	We need to change the existing level names to element coding in CSWD	Noted. Standard templates can be created and imported to new drawings as demonstrated at the presentation.

From	Comment	Response
	Some line type of Microstation (e.g. B-spline curve) cannot be recognised by Arc Info. This should be specified for both Auto-CAD and Microstation use.	<p>We would not wish to place restrictions on AutoCAD and Microstation users due to the fact that ArcInfo does not recognise certain element types that are produced in CAD.</p> <p>An advisory note to this effect should be added to the CSWD with respect to data exchange.</p>
PD (Paulina Kwan)	It is appreciated that the proposed standards have taken into account the prevailing practice in the engineering / architecture field to avoid drastic charges. However, as Planning Department is not a core works department, the proposed standards appear not directly applicable to our daily business though it is observed that interface / data exchange amongst the CAD systems in the major works department / agents are frequently required.	It is correct to say that the CSWD are primarily aimed at construction and construction-related drawings. Much of PlanD's work is generally at the front end of the construction sequence and we would agree that the CSWD are not applicable to front-end planning work. This type of work is probably best addressed using GIS and it is understood that a similar Study on GIS standards is being/has been undertaken on behalf of Planning and Lands Depts. The same could be said of Transport Department's planning work, although the CSWD are applicable to traffic signs and marking drawings. Maybe there is applicability if PlanD gets involved in more detail work such as landscaping and streetscape design?
Halcrow China Ltd (Alex Ng Shing Kon)	Takes times to analyse the elements what element codes belong to (especially for some kind of drawings : survey drawings, Hong Kong 1:1000 digital map drawings. Please could it be possible to analyse a survey drawing in the trial? (Survey drawings required by GEO slope remedial works projects.)	It is inevitable that users will take time getting used to the element coding initially. However, after a short time users will become very familiar with the element codes, especially those common to their particular field of work.
	How will be the HK digital map to the CADD standards when the implementation of the standards starting?	<p>Survey drawings will make extensive use of the following main classes:</p> <p>800-809 Ground Survey</p> <p>910-919 Boundaries and Enclosures</p> <p>LANDS department is not one of the Works Departments, so they will not be obliged to adopt the CSWD.</p>
	It is not effective to send one drawing with many models at one times to other parties (we cannot merge the models to the drawings) any good ideas?	<p>We feel the benefits to be gained in splitting data up into model files far outweighs the problems encountered with sending these files to third parties. We consider that, in the majority of cases, only the data contained in the model files is required by the third party and there is not actually a need to send the drawing file</p> <p>e.g. A third party may be designing the landscaping for a highway you are currently designing and therefore requires your highway information. In this case it is likely that you would only need to send your highway model file rather than all of your highway drawings.</p>

From	Comment	Response
HyD (Railway) (Yuen-yi Woo)	There were insufficient details / information during the presentation. Obviously, we will observe that there will be some difficulties and conflicts to prepare the drawings compliance with Highway CAD Standard (RD\IT\03) to suit CSWD standard. As RD\IT\03 is the related document of ISO Quality Management System	<p>The purpose of the presentation was to introduce the CSWD to the users. It was felt that going through the CSWD in great detail would be counter productive, as it would cause confusion and lead to resistance to the standards.</p> <p>It was felt that users would instinctively become aware of the details included in the CSWD during the CSWD trial and by reviewing the sample drawings, which were provided to the Departments.</p> <p>The CSWD incorporates a lot of Departments' current standards so we would not envisage users having too much difficulty migrating to the CSWD.</p>

Question 4 – Are there any changes to the proposed standards that you would suggest?

From	Comment	Response
HyD/Lighting (Woo Kwok Yuen)	More training to the users.	Noted – training should be given on a departmental basis.
ArchSD (Lam Kwok Keung)	<p>I would like to stress my concern on File Naming Convention on Model Files (I presume xref files in AutoCAD). The number of characters for File ID is considered not enough. I have to point out that there are around 100 projects to be worked on each year in ArchSD. We all understand that only an unique file naming convention could avoid over-written by each others. So we would include the InFORM number to each drawing file including xref files.</p> <p>The other area I want to point out is the Agent responsible ID per Layer name and File name. It is absolutely fine for Works Departments but not for Consultant/Contractors/Suppliers. Although ACL would compile a full list for the say firms/companies, I wonder who would responsible to maintain it than. I don' t think it is a sensible idea to assign characters to individual of them. We should better assign a broad ID for each group.</p> <p>The linetypes specification would be a major problem for the standard between the two CAD system. Please look into it.</p>	<p>Noted the InFORM (project) reference will be added to model file names.</p> <p>Noted. We would suggest that those companies, which often work for Government, are assigned Ids now. Others can be added later, possibly on a grouped basis as you suggest.</p> <p>The line-types have been addressed as part of the drawing symbol database exercise. Departments' drawing symbols and line-types have been rationalised and categorised in the database.</p>

From	Comment	Response
HyD/MWPMO (Yeung Yau Wah)	The main purpose of the proposed standard is to standardise all elements, which are used for preparing CAD drawings. So that other users can easily make use of these drawing files, for data exchange and to retain the output appearance of a drawing. But we noted that the definition of folders, file naming, layer naming is too flexible, so it makes it hard for users to follow the standard.	The CSWD cover such a wide range of work that they have to be flexible. If they are made too rigid, they will not be able to address the full range of construction work and the situations in which that work is undertaken. It is up to users to apply the standards to best suit their work. Once that has been done a few times, then the standards will be easy to follow.
Ove Arup & Partners (David Lai)	In the old days, the advantage of AutoCAD drawings was that it was easy to distinguish the thickness of lines on the screen by different colours. I also agree to use by weight but preferable the weight would match with certain colours. E.g. wt 3 = 0.35mm to use colours of 3, 13, 23, 33 43 etc...	Assigning certain colours to certain weights to distinguish between line thickness is best left to the discretion of individual users/organisations. Similarly the use of different colours for different layers to distinguish between layers is also left to the discretion of individual users/organisations.
	No "reinforcement" layers defined in structure	Reinforcement is assigned code 291 under Parts& Accessories in division 200-299 Structure Primary Elements, Carcass.
	Too many sub layers. E.g. grid – no need to separate into national grid, site grid, building grid etc...	Users can group all grids under element code 020. The CSWD will be used by a wide range of disciplines whose needs will be different – therefore the CSWD need to be flexible.
	Identical colour palettes would be helpful.	Noted – we have standardised the grey scales on the AutoCAD and Microstation colour tables so that the corresponding grey scales can be mapped during data exchange.
	Chinese font numbers should be standardized in Microstation.	The CSWD includes a font resource file (CSWD_FONT.rsc) which will standardise the Chinese font numbers. This resource file will include the Lands Dept. Chinese font and the CSWD Chinese font.
KCRC (Liu Ghung Ming)	KCRC will comment during the trials through the IT section.	Noted
Ryoden Engineering Co Ltd (Leung Kin Man)	At this stage, it is more appropriate to say we understood the direction of the CAD standard. Let's see what exactly it is in the coming year.	Noted. It is correct to say that the standards will develop over the next few months.
Leigh & Orange Ltd (Desmond Leung)	File naming convention is not comprehensive.	We believe it is comprehensive but it would be true to say that it is not prescriptive i.e. the standards still allow an amount of flexibility in how to create file names. Given the range of work that the standards will address, we consider this to be the only practical solution.
Ryoden Engineering Co Ltd (William Poon)	I would like to follow the question about non-revision status of Model file system. I think during a project period, some CAD production parties use the model file that may be others party's drawing file. For example of ours' E&M work, we build our services drawing on top of the architectural model file. As everybody understand that Hong Kong's projects	It is quite true to say that others' model files will regularly change during the course of a project. CAD is an excellent tool for facilitating co-ordination by always referencing the latest version of another's model file. We suggest that the following simple procedure is

From	Comment	Response
	are habitually change from time to time during the construction period. We are hardly to distinguish which Model file is the most appropriate.	<p>followed to make sure that the latest version is always used:</p> <ul style="list-style-type: none"> ➤ Place the initial incoming file into the “incoming” folder; ➤ Reference that file to your own drawings ➤ On receipt of a new version of the incoming file, move the original version to the “revision” directory and add a revision suffix “A” to its name ➤ Place the new version, with the same name as the original, in the “incoming” folder. ➤ Your drawings will automatically reference the new version. ➤ Repeat the process each time the file is updated, renaming to rev B,C...etc.
Ryoden Engineering Co Ltd (William Poon)	Being an E&M group worker we are, I wonder there only have 2 trial users out of the total 50 participants undertaken, the result can be completely reflected.	ArchSD Building Services Group, EMSD and WSD will ensure that E&M aspects are fully covered in the trials.
Ryoden Engineering Co Ltd (William Poon)	When the adoption of CSWD standard being commenced in next year, will a standard control file such as the template file for AutoCAD or seed file for Microstation can be released to all working parties involved?	Yes, all necessary files will be made available through the Works Bureau web site.
Ryoden Engineering Co Ltd (William Poon)	The CSWD Standard should be included the standardizing of using Symbols, Legends and Abbreviations of each field of works.	Standard symbols will be provided initially. The other elements you suggest could be standardised later by the CSWD Administration Committee, if considered necessary.
Ryoden Engineering Co Ltd (William Poon)	I suggest training should be provided to user and classified by separate working field.	We will discuss the potential to provide training courses with the Works Bureau.
Ryoden Engineering Co Ltd (William Poon)	As AutoCAD 2000 has been already launched few month ago and MicroStation V8 will be available soon. The CAD software versions according to yours exercise are AutoCAD 2000 and Microstation SE or J respectively. Do you think the standard can be fully compatible with the new version?	<p>The standards have deliberately been kept as generic as possible and do not address particular CAD package versions. Microstation V8 does appear to have some very good features that will make some aspects of the CSWD and CAD in general easier to deal with e.g. data transfer.</p> <p>Inevitably, the CSWD will need to change over time to take advantage of new features of new CAD software releases. This will be dealt with by the CSWD Committee, which will be formed next year.</p>
Ryoden Engineering Co Ltd (William Poon)	I have a ideal that both AutoCAD and Microstation has already have a certain amount users in the Hong Kong market and the Works Bureau is trend to use both software equally. Is it possible that some affected party of HK can be invited the both software organization to form a exchange information committee or joint venture to investigate a new file format for both CAD recognized such as an example for a BMP file that can be both open and editing by	<p>One of the advantages of the CSWD is that they will bring users together, which will give strength in numbers when dealing with CAD suppliers and making good suggestions such as the one you give.</p> <p>The Works Bureau web site will keep users informed of developments and give points of contact for interested parties to join in developing the standards.</p>

From	Comment	Response
	Microsoft Paint and Adobe PhotoShop respectively.	
Ryoden Engineering Co Ltd (William Poon)	Will this CSWD standard introduce to Hong Kong Housing Department?	Please see HKHA's comment on Page E-23. They do not intend to use the CSWD for their internally produced drawings but will adopt the standard for drawings that are sent to others.
Ryoden Engineering Co Ltd (William Poon)	Last one is my own opinion that I fully support the establishment of the CSWD Standard and adoption but I have my feeling that (may be I use AutoCAD mostly) the study is take more account on the Microstation than AutoCAD.	<p>Thank you for your support.</p> <p>We have tried to treat Microstation and AutoCAD equally and there should not be a bias. In some ways, AutoCAD is a simpler system than Microstation and requires fewer settings to be specified. This may give the impression that the CSWD take more account of Microstation, but please be assured it is not the case.</p> <p>It is important that both systems continue to be used in Hong Kong to maintain competition, which will raise standards and avoid over-pricing.</p>
PD (Leung Sik Cheong)	Although Microstation V.8 can support unlimited levels, it is recommended that users should minimize the number of levels used and data should be input from level / upwards one by one consecutively.	Agreed that too many layers in a file should be discouraged. We believe that if the number of layers becomes large, it is better to split the data into more than one file. It must be remembered that only one user can work on a file at anyone time. If too much data is placed in a particular file, this may prevent efficient working.
PD (Paulina Kwan)	Based on our past experience, Planning Department is frequently requested to provide zoning boundary and its annotation to works agents / departments for their reference. Hence, please consider to develop relevant resources files to help conversion of the relevant layer into the proposed element coding system so that this department could easily adopt the proposed standards as far as possible.	<p>A meeting was held at PD's office with Leung Sik Cheong regarding the CSWD and how they could be utilised by Planning Department. Particular attention was paid to the element coding and examples were provided as to how they could be applied to PD's zoning drawings. It is envisaged that PD will make extensive use of <i>classes 910-919 Boundaries and Enclosures</i> with the use of the user definable code to distinguish ownership e.g.</p> <p>913_C lot/land allocation boundaries – Commercial</p> <p>913_G lot/land allocation boundaries – Government</p> <p>913_I lot/land allocation boundaries – Industrial</p> <p>913_P lot/land allocation boundaries – Private</p> <p>913_R lot/land allocation boundaries – Residential</p>

From	Comment	Response
Halcrow China Ltd (Alex Ng Shing Kun)	The CADD file data sheet : Suggestion : add a <u>layer numbers</u> column may be more flexible and effective.	Although with current versions of Microstation each layer name has to be assigned to a level number, the CSWD does not make use of the level number and is trying to coax users away from thinking in terms of level numbers but to think in terms of level names. This way of thinking will become even more apparent when users begin to use Microstation Version 8, which places much greater emphasis on the use of layer names. We would therefore not wish to include level numbers in the CAD file data sheet.
HyD (Railway) (Yuen-yi Woo)	Mostly we will attach the alignments and stations from various railway projects, so we wish the Project code should be include in File Naming Convention.	Noted – there has been a lot of similar requests and the project code will be added to the file name.
HyD (Railway) (Yuen-yi Woo)	Details of the project code please refer to the feedback for File Naming Convention, which was prepared by R&D Highways Department.	Noted – we will refer to this correspondence.
MTR Corporation (William Lam)	<p>The layering structure is not standardised yet. Suggested to state the principles even it cannot be compromised amongst the Departments.</p> <p>Moreover, it is suggested to classify drawings into types, i.e. geo-spatial (layout plan, section, elevation), schematic diagram, table, detail, notes. The requirements of compliance with CAD Standard should vary according to the drawing type.</p>	<p>It is felt impractical to totally standardise layer names – a degree of flexibility needs to be provided. The first three characters of the element field taken from the CSWD Element Coding Tables currently standardise part of the layer name. The fourth character or sub class is currently user definable, although once users have become competent with the use of the CSWD it is envisaged that this could also be standardised. To provide flexibility it is felt best not to completely standardise the user definable field but users may wish to standardise this field on a project basis.</p> <p>Whilst the CSWD is in its infancy it is felt best to apply the CSWD to all drawings except presentation drawings.</p> <p>Once departments have familiarised themselves with the CSWD the CSWD Committee could look at relaxing the CSWD for certain drawing types.</p>
KCRC Luk Hoi Leung, Dickson	<p>Global Origin and Working Unit Drawing settings:</p> <p>The proposed global origin and working units settings are different from existing standard. In case legacy drawings are required, there is a need to change the settings and then move and scale existing drawing elements back to the original co-ordinate and size. This requires substantial effort. Also, clipped location of reference file and reference attached by saved view cannot be maintained after the modification. Manual relocation is required.</p>	<p>Noted, as you are aware we have been discussing these issues with Bentley and it would seem this problem has now been resolved.</p> <p>Bentley are to include an option on the reference file dialogue box which will give you the option of aligning the reference file global origin with the master file global origin if the two global origins are different. This will in effect automatically shift the reference file so that it correctly overlays the master file.</p>

From	Comment	Response
KCRC Luk Hoi Leung, Dickson	Working Units – Drawing settings The proposed working units settings give an maximum accuracy of 1mm which is sometimes not adequate for E&M and architectural drawing. For example, if a facility array on a large architectural layout plan is placed in a rotated view of Microstation, sometimes the facilities are reference to the adjacent one rather than a common reference point. The positional error will accumulate and may end up to a few millimetres for the last facility object in the array.	Noted, all Departments currently use this working units setting for metres drawings, as do LANDS. Where greater accuracy is required the CSWD working units setting for millimetres drawings can be used.
KCRC Luk Hoi Leung, Dickson	Grey scale – Drawing settings Files from CSWD sample – cswd_fs.plt & cswd_hs.plt have the RGB values for the five grey scales in the color table but they are not specified in the standard.	Including such settings in the CSWD is not considered necessary as it would just increase the size of the CSWD and daunt the users. Users wishing to know such settings can interrogate them from the colour table.
KCRC Luk Hoi Leung, Dickson	Agent code for file name and layer name – Operation issue Two-character agent code is not adequate to uniquely identify all organizations in the industry.	Agreed – three characters will be used.
KCRC Luk Hoi Leung, Dickson	Revision code – Operation issue Adding the revision or status code to the end of filename will cause an operation issue if the revision or status of a reference file changes. There is a need to manually update all master files using this reference.	The CSWD does not recommend adding revisions to live model files. We have suggested that users who wish to keep a record of previous revisions of model files could place a COPY of the model files in the REVISION folder and append the revision status to this file for record purposes only.
KCRC Luk Hoi Leung, Dickson	Directory structure – Operation issue There is only one directory proposed to store all drawings belong to the same project. The lack of sub-directories is not flexible in storing and categorizing drawing files.	Any of the directories can be further sub-divided to suit large projects.
KCRC Luk Hoi Leung, Dickson	Plotted line thickness – Operation issue There is a half size plot configuration file – cswd_hs.plt included in the CSWD sample but only one plotted line thickness scheme is specified in the standard. One plotted line thickness scheme cannot ensure the best and readable hardcopy output. It may be too thin for A0 drawing and on the other hand too thick for A3 drawing.	The half size plot configuration file applies a 25% reduction to the CSWD line thickness, this gives a clear and concise print when plotting drawings at half scale. Including such settings in the CSWD is not considered necessary as it would just increase the size of the CSWD and daunt the users. Users wishing to know such settings can interrogate them from the plot configuration files.

From	Comment	Response
KCRC Luk Hoi Leung, Dickson	<p>Drawing effective area – Operation issue</p> <p>Suggest standardizing the drawing effective area for each drawing size (i.e. A0, A1). Since each organization has its own title block, some have the drawing information column at the right while others may have it at the bottom. This results in different effective drawing area inside the title block and requires manual adjustment when drawings are exchanged between organizations.</p>	<p>Departments have long established standards when it comes to drawing frames, attempting to change such standards is unlikely to be successful and is not really necessary.</p> <p>In most cases when people exchange data the only information they are interested in is the data contained within model files. This being the case users can simply reference other people's model files into their own drawings. Copying the entire contents of one parties drawing into another parties drawing is simply duplicating information, although we appreciate this does happen, we would hope this is not common.</p>
KCRC Luk Hoi Leung, Dickson	<p>English Text Sizes – Drafting practice</p> <p>It is suggested that minimum English/Chinese text heights for drawings from A2 size and above be stated in the CAD Standard. This is because photo-reduction or plotting to A3 and even A4 size from the original large size drawing is very common and text becomes illegible if already small in the original. Our experience for A1 drawings is that the English text height be a minimum of 3mm and for Chinese, a minimum of about 4.5mm.</p>	<p>The text sizes given in the CSWD apply to all drawing sizes and are as a result of extensive consultation with the Departments where such issues were raised and considered.</p>
KCRC Luk Hoi Leung, Dickson	<p>Colour table – Drafting practice</p> <p>It is suggested using AutoCAD default color table even for Microstation since it provides a wider variety of color options.</p>	<p>Noted, the majority of Microstation users are all familiar with using the default Microstation colour table and it would seem unnecessary to completely change the default colour table as there will not be any significant benefits in doing this.</p> <p>Colour drawings are very suggestive and it is for this reason that we do not standardise such drawings under the CSWD. Regardless of the number of colours and the variation of colours you have on a colour table, users will always want to introduce new colours.</p>
	<p>Directory structure – Operation issue</p> <p>It is suggested a drawing list or summary (transmittal) be put under the project directory for ease of data exchange since most of the time the drawing filename cannot indicate what the drawing is about.</p>	<p>Good Idea, users are currently free to add such items to the CSWD folder structure. A number of the Departments either have or are in the process of setting up Drawing Management Systems which will automatically create drawing lists and transmittal forms.</p>

From	Comment	Response
KCRC Luk Hoi Leung, Dickson	<p>Element Coding – Operation issue</p> <p>The defined codes are mainly for architectural and building services. There is not much defined for Railway Systems such as CCTV, signalling and control.</p>	<p>CI/SfB is buildings biased but we have attempted to give infrastructure and equal share. More codes can be added as required.</p> <p>Element 647 will be added for Signalling</p> <p>Element 642 will be added for CCTV</p>
KCRC Luk Hoi Leung, Dickson	<p>Title Block – Drafting practice</p> <p>In the CSWD sample, the title block frame is placed as an element in the drawing file. It is suggested the title block frame be specified as common reference file to the drawing files. This minimizes the effort in replacing the title block when drawings are exchanged between organizations. Also, if the drawing title is drawn in true size (i.e. A1, A0), it will be more intuitive for user since the attached scale of title block is directly corresponding to the plotting scale of the drawing.</p>	<p>Agreed, we would always place the drawing frame in a model file and would strongly recommend this to everyone. The sample files available on the WB web site all use a model file for the drawing frame.</p> <p>The file created by HyD for the CSWD trial did have the drawing frame placed live in the drawing file, although HyD's normal practice would be to reference the drawing frame as a model file.</p>
KCRC Luk Hoi Leung, Dickson	<p>Layer Naming – Drawing setting</p> <p>The standard does not require a strict mapping of layer names to level numbers of Microstation. If two drawings of different mappings are reference to each other, it will give the wrong layer name when checking the level of a reference element since Microstation used to match the level number. Therefore, it is suggested a strict mapping of layer names to level numbers be specified. As there is a 63-level limitation, it is also suggested that different mappings be used for different disciplines.</p>	<p>Under the CSWD level numbers have no use. Level numbers are simply a requirement of the current Microstation software, which will be removed when users start using Microstation version 8.</p> <p>The traditional method of determining which layer an element in a model file is on is to copy that element, this will then display the layer name of that element in the command window or on the status bar. To see the layer name displayed for elements in model files users will need to switch level names on in the reference file category on the user preference menu.</p>
KCRC Luk Hoi Leung, Dickson	<p>Element Coding – Operation issue</p> <p>It is suggested sequential use of element code and avoids unused code in between.</p>	<p>I The structure of the CSWD Element Coding Tables is based on CI/SfB, which uses a clear and well established categorisation structure. The unused classes allow for future expansion.</p> <p>If you were to use sequential element codes you would not have clearly segregated bands of elements, the table would read as one big table, which would be confusing for users.</p>

Question 5 – Do you think that the CSWD will bring benefits to the Construction Industry in Hong Kong?

From	Comments	Responses
HyD/Lighting (Woo Kwok Yuen)	Only small portion of CAD data needs to be transfer among other parties. But large change of current drawing practice and training are needed.	<p>Agreed that not all data needs to be transferred at the moment, although under Government policy for e-commerce, a full set of design drawings will be given in soft copy to a contractor for example. Data transfers will increase significantly in the near future.</p> <p>To an extent, the current limited transfers that occur are due to the lack of a common standard that the CSWD will provide.</p>
HyD/MWPMO (Yeung Yau Wah)	The benefits of using “CSWD” standard depends on whether the whole Construction Industry in Hong Kong will adopt to use this standard or not. We noticed that not all the consultants are involved in this study. They already have their own drawing standard. Therefore, there are problems when exchanging of data with them.	<p>As the Consultation Document states, Government is the major initiator of construction projects in Hong Kong. Therefore anyone that works on these projects will be required to work to the CSWD. It will only be on rare occasions that consultants will supply drawings to the participating departments not as part of a contractual requirement under a Consultancy Agreement. In this rare circumstance, drawings might be provided to a different standard.</p> <p>We hope that those consultants that carry out a lot of work for Government will eventually adopt the standards as their own in-house standards. There would be large benefits in terms of training and consistency if they do.</p>
Ove Arup & Partners (David Lai)	Since they still use 2 different cad systems & hopefully can be widely used with compatible to MTRC, KCRC, Housing, Big developers as well.	A very good point, with which we agree. The standards will become even more widespread if they are adopted by other major client organisations such as the MTRCL, KCRC, HKHA etc. Obviously, there is no contractual commitment for these other organisations to adopt the CSWD, but it is believed that there would be major benefits to the whole industry if they did.
KCRC (Liu Ghung Ming)	Better work discipline and therefore quality improvement.	Agreed – we believe that the consistency that the standards will bring will improve discipline and quality.
	Higher efficiency after the transition period.	Agreed – a consistent set of standards, together with the proposed Standard Interface, will improve efficiency once operators are used to the CSWD.
	Improved translation of AutoCAD to Microstation.	Agreed and Microstation V8 is likely to improve data exchange even further.
Ryoden Engineering Co Ltd (Leung Kin Man)	Yes. It does. To a practical extent, every item of CAD should be standardised. It will not only raise the future implementation of the standard but also avoid arguments among different contract parties.	Agreed, although we want to strike a balance between standardisation and allowing flexibility to cater for the unexpected. If standards are too rigid they become impractical and users will not want to work to them.

From	Comments	Responses
Ryoden Engineering Co Ltd (William Poon)	It will much depend on the commercial business's application.	Agreed that some areas of the industry will benefit more than others. Those that receive data as well as provide it will benefit most.
KCRC (Wai Ka Keung)	In the long term, if everyone follows the same standard, errors can be kept to a minimum. In recent time of financial difficulties in Hong Kong, I just wonder whether most co will put more money and resources to keep on this new standard. To look at the future, I think it is a very good way to become a World leader in this discipline.	<p>Agreed that the longer term benefits will more than counter any implementation costs that arise.</p> <p>Companies will have to implement the CSWD if they want to work on Government projects. If they really think that there is a cost associated with this then they would build it into their tender prices. We would be most surprised if this was to happen.</p> <p>We too hope that the CSWD will help with Government's aim of making Hong Kong a world leader in e-commerce in its widest sense.</p>
ITSD (Lawrence Lai)	The CSWD will facilitate CAD data exchange.	Agreed and other significant benefits will come as a result.
PD (Paulina Kwan)	If technical issues could be resolved. Standardisation of data specification would definitely help data transfer and sharing.	Noted – we believe that the CSWD will bring these benefits.
Halcrow China Ltd (Alex Ng Shing Kun)	Major benefits for big projects.	Agreed, CAD's full potential can be realised on large multi disciplined projects when CAD is used in a structured manner. The CSWD aims to promote a structured approach to CAD data.
	A few benefits for small projects : Take more times. (project with only few drawings)	Agree that benefits may be less on smaller projects but disagree that drawings will take longer to produce once operators are familiar with the standards.
MTR Corporation (William Lam)	<p>It is recommended to aim for a common Global Origin for HK including Lands Department.</p> <p>Element coding for Building is a good start. The benefit of using these codings is yet to develop.</p>	<p>Noted, with the release of Microstation Version 8 and its limitless design plane all Microstation users in Hong Kong can now use the default Microstation global origin (CSWD) regardless of the working units setting being used.</p> <p>To overcome the problem of referencing historic files which use different global origins, Bentley are to include an option on the reference file dialogue box which will give you the option of aligning the reference file global origin with the master file global origin. This will in effect automatically shift the reference file so that it correctly overlays the master file.</p> <p>Agreed. The CSWD system is very similar to that already used by ArchSD, where it has proved to work very well.</p>

Other Comments

From	Comments	Responses
KCRC (Francis Chan)	<p>Thanks for your good presentation, I have some comments on the standard shown below:</p> <p>It is a good idea to use model files concept for design, all related drawings are automatically updated once the model file has been updated. This will minimise to use the wrong information and keep all drawings in consistent manner. However, in practice, the model file may revise quite a lot especially on the preliminary design stage. It is hard to let people know which version of model file(s) has been used for which version of drawings if we need to copy electronic file to the related parties. So, would I suggest that try to consider using e-file management approach such as folders design to control the versions of model files.</p>	<p>Agreed – one of the major benefits of CAD is that automatic updating of information can greatly help in facilitating co-ordination. But, as you say, there is then the question of version control.</p> <p>We would suggest regular archives be kept, especially at milestone points in a project's development.</p> <p>Good drawing management systems that support the use of model files and their revisions are hard to find.</p>
KCRC (Francis Chan)	Please consider that the height of text should be clear when the plot is reduced to smaller size.	Agreed and for this reason we were reluctant to put very small text sizes into the standard but many users requested them. Operators will have to use their common sense and not use small text sizes if drawings are going to be plotted at reduced size.
KCRC (Francis Chan)	Please consider the standardisation of output (line type, thickness and colour) while using different drivers for different plotters.	<p>For consistency we would not wish to change the default line type output of the plot drivers. The CSWD currently has 8 standard line thickness for full size drawings. Users will need to incorporate these line thickness values into their Microstation/AutoCAD plot settings tables.</p> <p>Colour on colour drawings is best left to the individual users as the choice of colour is subjective and is likely to vary depending on the purpose of the drawing. We would recommend users adopt a WYSIWIG approach to colour so that the colour, which appears on your screen, is the colour, which will be plotted, rather than manipulating the output through the Microstation/AutoCAD plot settings tables.</p>
Scott Wilson (Wai-kit Leung)	We have some comments as given below. In addition, we wish to recall the ACEHK initiative in the development of the ACECODE for effective drawing management. The project was funded by the former Service Support Fund of the Innovation and Technology Commission of the HKSAR Government with the objective to develop effective drawing management tools to benefit the construction industry as a whole. We trust that you are well aware of this (copy of letter distributed to you dated 27 July 2000 about the product launch is enclosed again for your easy reference) and would take this into account in your study. For your information, Scott Wilson has incorporated the ACECODE in some of the recent projects since its launch in July 2000. As for Government projects, ACECODE has been adopted	Thank you – we will investigate the applicability to the CSWD.

From	Comments	Responses
	in CED's Contract CV/2000/06 – Formation and Associated Infrastructure Works at Choi Wan Road & Jordan Valley. At present, details of ACECODE are nested in the Scott Wilson web site. Please note that apart from streamlining registration of paper drawings, ACECODE could facilitate registration of electronic drawing files as it sets a standard on drawing title block which enables standard interfaces to be implemented for direct extraction of drawing title block data from the drawing file.	
Scott Wilson (Wai-kit Leung)	<p>CAD standards used by the LIC of the Lands Department</p> <p>Given that many of the engineering projects in Hong Kong use data from the Lands Department, it is important to ensure compatibility between the standards of the drawing files from Lands Department and the CSWD.</p> <p>Implementation strategy for on-going projects or completed projects that may have to be used in the near future.</p> <p>While the newly refined CSWD protocols may be easy to adopt on new projects that are to start from the scratch, it may be very involving and somehow intricate to implement these protocols for existing data. What methods of approach are advised in dealing with existing data pertaining to on-going and/or completed projects?</p>	<p>During the Base-lining Stage of the Study, we had discussions with LIC of the Lands Department and collected information regarding their CAD standards so that we were fully aware of their standards and could be keep this in mind when creating the CSWD. This is evident in the CSWD's choice of global origin and working unit for Microstation drawings, which follow that used by Lands Dept.</p> <p>Departments will need to consider on-going projects on a case by case basis as to whether it is worth updating them to the CSWD.</p> <p>As there is no contractual requirement for drawings to be produced to the CSWD in current Consultancy Agreements, then we would envisage that the CSWD will only apply to new agreements.</p>
Scott Wilson (Wai-kit Leung)	<p>Interface of core CAD platform with tributary key design systems</p> <p>CAD simply as a kernel of engineering design inevitably has to exchange information with the global design support tools including graphics, GIS, parametric engineering modules such as MOSS/InRoads, etc. How would this kind of interface be established and managed under the CSWD?</p>	<p>We consider that the proper structuring of CAD data is a start in allowing an interface with other packages as mentioned.</p> <p>Interfaces with particular packages will be developed over time, mostly on projects and on an 'as-required' basis and added to the CSWD through the CSWD Committee.</p>

From	Comments	Responses
Scott Wilson (Wai-kit Leung)	<p>Line types, especially usage of custom / non-standard line styles</p> <p>The CSWD specifications seem to have ignored this subject which is very critical in the CAD industry. No line styles have been discussed. In addition, it is not stated whether special line styles are allowed for use, and if so, how to deal with them across different species of CAD platforms.</p>	<p>Users are free to use the AutoCAD and Microstation default line-types as they wish. The use of custom line-types is permitted under the CSWD, although we would recommend custom line-types be used in moderation.</p> <p>Custom line-types have been addressed as part of the drawing symbol database exercise. Departments' drawing symbols and line-types have been rationalised and categorised in the database. We have proposed to create corresponding custom line-types in AutoCAD and Microstation so that they can be mapped during the data exchange process.</p>
Scott Wilson (Wai-kit Leung)	<p>Lack of disaster recovery planning</p> <p>As part of standard QA, there ought to be a disaster recovery plan that is reliable and secure. The current edition of CSWD seems to fall short of such critical requirement.</p>	<p>This is outside the scope of the Study and, we consider, outside the scope of the CSWD, which cannot specify QA procedures for all participating organisations. It is up to QA registered companies to determine their own disaster recovery plans, formulate appropriate procedures and have those procedures approved and audited by the QA regulatory authorities.</p>
Scott Wilson (Wai-kit Leung)	<p>Standard procedures for handling referenced data during archiving or system porting-over</p> <p>Considering the fact that there are various means of handling coordinated / reference data during information archiving or system porting-over, and of course bearing in mind that each one of the options is associated with unique technical problems, shouldn't the CSWD advise on standard procedures recommended for such circumstances?</p>	<p>Again, this is outside the scope of the CSWD Study.</p> <p>Organisations should develop their own procedures for the situations you describe.</p>
Scott Wilson (Wai-kit Leung)	<p>Lack of standard guidelines in handling Chinese characters</p> <p>Nowadays in Hong Kong, most CAD projects are bi-lingual, involving frequent use of Chinese characters. The challenge in this respect is to identify the most suitable Chinese character system and fonts to adopt. However, the current CSWD edition seems to have disregarded this subject.</p>	<p>Considerable effort has gone into standardising Chinese text, which was quickly recognised under the Base-lining stage of the Study to be a major problem.</p> <p>As stated on Page 11 of the Consultation Document, a standard font set will be provided for use with the CSWD. It will:</p> <ul style="list-style-type: none"> ➤ Be in Ming font ➤ Have all standard Chinese characters as well as those of the Hong Kong Supplementary Character Set ➤ Be in BIG-5 format initially and migrate to Unicode format once Microstation V8 is in full use in the departments.

From	Comments	Responses
		➤ Be provided in suitable formats for use in AutoCAD (.TTF) and Microstation (RSC)
Housing Department, D&C Branch (Alex Ho)	HD will keep the current drawing practice in order not to change a lot for staff and Quality Manual. It was suggested to convert to exactly the same format as Works Bureau before doing the drawing exchanges.	Noted. It will be of great benefit if HD uses the CSWD when exchanging data with other parties – thank you.
Housing Department, D&C Branch (Alex Ho)	To state how long will have a revision on the standard.	We would expect the first revision to happen a few months after the CSWD have been put into 'real' use and any flaws in the standards come to light. After that, we would expect minor enhancements every 4-6 months or following significant changes in the functionality of AutoCAD and Microstation through new releases of those packages. Additions to the symbols database could happen quite regularly – every 2 months or so.
Housing Department, D&C Branch (Alex Ho)	To state the method of notification to the Works Department.	Through the CSWD pages on the Works Bureau web site.
Housing Department, D&C Branch (Alex Ho)	Too many layers = no layers. Simplify CiS/FB is suggest.	Agreed but too few layers = no structure and limited re-use. A balance must be struck, which we believe the Element Coding table provides. Operators can use grouped classes to limit the number of layers.
Peter Chi-Wai Pang CADD Support Analyst ITSD – Technical Support Kowloon Canton Railway Corporation	As the CSWD is to be made contractual in the coming construction project, I would like to ask you if the government have any schedule for the CSWD. (If you have, would you please send it to me for reference?)	The key dates are given in the slides of the presentation, which are enclosed in Appendix C of this report.
	Is there any registration mechanism so that the agency code can be registered?	Agency codes will be developed under this Study initially and maintained by the CSWD Committee. KCRC will be included in the list (KCR)
	Is there any mechanism for the symbol, cells, etc to be consolidated in the central library for the public to download?	Yes, an initial set will be provided for download and updated regularly. Suggestions for additions will be able to be made through the web site.
	As you said the Chinese font file will be made available to the public, is there any license constraint?	The font set will be owned by the Works Bureau and under the licensing conditions that it can be made available for others to use it.

From	Comments	Responses
Patrick Chan Secretary General of the Hong Kong Construction Association	<p>Thank you for your presentation to our representatives on 30 October 2001.</p> <p>Since the presentation at end-October 2001, HKCA IT Working Group has consulted our members and received favourable support.</p> <p>We support the move to produce a common set of CAD Standards for all the Works Departments and believe that the final products should become compatible with the common international standards, especially the standard being adopted in mainland China.</p>	<p>Thank you for your support of the CSWD.</p> <p>Together with Departments' current practices, international standards have been used to set the CSWD. Standards developed on the Mainland can be monitored and incorporated into the CSWD as they are developed and if they are relevant.</p>

APPENDIX F

RESPONSES TO COMMENTS FROM THE HKIA

APPENDIX F - RESPONSES TO COMMENTS FROM THE HKIA

Item No.	Comments	Responses
1.	<p>General Comments</p> <p>What the standard is for...? In addition to specific requirements on 'standards', this CAD document also contains two other types of information namely: 'good practices', and the 'reasoning behind the specific requirements'.</p> <p>Part 3 of this standard is about 'good practices'. This type of information can however be confusing as 'good practices' can only be recommendations and not requirements, and can become misleading when put in the same document containing requirements specific to the Works Bureau.</p> <p>Further, the scope described under 'good practices' is very limited and does not address many of the tools already being practiced by professionals using more advanced software; further, many of the good practices recommendations are already well documented in other internationally accepted standards.</p> <p>The parts concerning 'reasoning behind the requirements' can be expanded so that the users of this standard can better judge whether the requirements can be adapted to non-Works Bureau works. This is important especially since this standard also aspires to be a 'de facto' standard throughout Hong Kong.</p>	<p>We would first explain that the purpose of the Consultation Document is to consult. It is not 'the Standard' in its final form.</p> <p>We felt that in order to give the background to the proposed standards, some of the principles that have been used to develop the standards should be explained. We were limited by the requirements of the Brief to keeping the Consultation Document to less than 20 pages (excluding the appendix). In order to address, at least briefly, all the elements of the Study, it was not possible to go into any more detail. Indeed, if the document had been any longer, it would be unlikely that readers' interest would have been maintained. Part 3 is therefore background and not part of the 'standard'.</p> <p>We do agree, however, that some of the language in the document is not clear as to what is mandatory and what is recommended. This is generally due to a hang-over from previous stages of the study when we were making recommendations. Once these recommendations have been finally endorsed by the Study's Working Group, then we will use prescriptive language, as applicable, in the documentation of the final standards.</p> <p>While the 'good practices' may be well documented in other internationally accepted standards, we found that the simple, basic principles of maintaining as much unique data as possible were not in full use throughout the participating departments and we considered it important to restate these principles. While the scope may appear limited in this chapter, we consider that these fundamentals are all that is needed to put CAD to effective use. With regard to 'more advanced software', we had to set the standards for the software in use within the participating departments. While your comment does not describe what this software is, we are not aware of anything that does not use the basic principles described.</p>

Item No.	Comments	Responses
	<p><i>Recommendation:</i></p> <p>Decide whether “good practices” really do belong in this standard. If yes, then expand the scope to take account of the more advanced CAD techniques (with reference to other internationally accepted standards as appropriate).</p> <p>Expand on the “reasoning behind the requirements” to explain why certain elements are required. This will let users know whether certain requirements are the result of specific government business processes.</p> <p>Make a distinction in the document between ‘absolute requirements’ and ‘background information’ or ‘recommendations’.</p>	<p>We will review the way in which the principles on which the standards are based are described in the final documentation of the standard and will also expand on the reasoning behind the requirements, as you suggest.</p> <p>At this inaugural stage of the CSWD, we would not wish to expand the standards nor make them any more complicated or require the use of software that is not in current use within Government. Many of the comments on Appendix E expressed the opinion that the standards are too complex already. Our view is that they address a ‘middle ground’ that can be expanded later under the guidance of the CSWD Committee.</p> <p>Agreed</p>
1.1	<p>Other Standards</p> <p>There are already a number of internationally accepted standards relating to the drafting and CAD. Some of these standards are more ‘general good practice’ in nature, while other standards are meticulous and detailed. Although this draft standard refers to BS 1192, the reference is vague.</p> <p><i>Recommendation:</i></p> <p>Make maximum use of other internationally accepted standards (ex: BS ISO 128-21, S EN ISO 3098-5). Make specific references to those standards (or portions of those standards) suitable for adaptation. Some of these internationally accepted standards contain valuable practice recommendations on drafting and CAD; these can be highlighted and made known to users of the Works Bureau standard.</p>	<p>The standards broadly follow the recommendations of BS1192. We did examine all international CAD standards and considered BS1192 to be most relevant and simple to adapt to the perceived requirements of the participating departments. We do not see the need to introduce parts of other standards into the CSWD at this stage.</p>

Item No.	Comments	Responses
1.2	<p>Different scales</p> <p>When compared to those of other disciplines, architectural drawings are more demanding in terms of scale changes. Within a typical set of architectural drawings are usually drawings of three different scales: small scale (site plans, floor plans, etc), medium scale (wall sections, etc) and large scale (details).</p> <p>The CAD standard currently does not address the issue of varying scales. The scales of the intended final output must be considered in the CAD standard because issues such as line weights, shading, etc vary according to the final output scale.</p> <p><i>Recommendation:</i></p> <p>Address how drawing scales affect the CAD standard.</p>	<p>But we do not believe the CSWD should say “all small scale details must be drawn at 1:10” for example, as this would serve no useful purpose. We are setting CAD standards, not presentation standards. Surely it is better to say – “draw at whatever scale you think is most appropriate and use these pens and text font in order that when your drawing is transferred to another organisation nothing will be lost in the translation”</p> <p>While we agree that line weights and shading vary according to the scale drawn at, we merely wish to ensure that all users have a common set of line weights and shadings available for use.</p>
1.3	<p>Over categorization</p> <p>Perhaps <u>most worrying</u> is the extensive requirement for ‘element coding’, namely; There is not enough explanation as to the reasoning behind such an “element coding” concept. What does the Works Bureau want to achieve with this idea? Are these codes intended to tie in with a BQ and/or specification system?</p> <p>In the ‘Standard’, an ‘element’ is defined as “the physical parts of construction and related works.” This idea however is counter to the whole principle of drawings. Architectural drawings have a fundamental need to show ‘assembly’ – how different products/ systems interface with one another. Therefore to break a drawing down into hair-splitting elements could make the drawing task almost impossible. For example, a stone floor is an assembly usually consists of stone, setting bed, reinforcement, structural slab and waterproofing. In this “element coding” system each of the above will have to be drawn on a separate layer – this doubles the number of lines making even a simple drawing incredibly complex and difficult to draw.</p> <p>Because construction is interrelated, it may be impossible to fully define what is what. For example, where does a floor end and a stair begin? There seem to be far too many elements with the potential for 10,000 classes, how can anyone manage this?</p>	<p>The use of element coding has been made very flexible and we do not agree that it needs produce over-categorization.</p> <p>There has to be an amount of common sense applied to the use of the element codes. The example you quote appears to be of what would be a large scale detail of a stone floor. A detail of this nature could all be categorised as a floor finish as that is what the detail is showing.</p> <p>But if the structural slab and reinforcement are drawn by the structural engineer, in the engineer’s own file and that file is referenced by the architect to co-ordinate with the floor finish details, then the structure and finish would not only be in different layers, but also in different files.</p> <p>Such a review was carried out before choosing a modified SFB coding system. This is an architecturally biased system and is already in use in the Architectural Services Department. It is recommended in BS 1192 and we consider it is the correct choice. You will note that we have had to modify the standard SFB system to cover all elements that are constructed by the Works Departments. We could not find a single international standard that covered this range of elements.</p>

Item No.	Comments	Responses
	<p><i>Recommendation:</i></p> <p>To seriously rethink the proposed 'class' system while reviewing CAD systems used in other countries to see whether similar systems exist elsewhere and the success of their implementation.</p>	
1.4	<p>Integrated Contract Documents</p> <p>The current CAD standard has no relationship to other parts of the contract documentation system. Each contract document contains 4 parts: specification, drawings, schedules and Bills of Quantities. CAD standards are only a sub-group of drawings.</p> <p>The main objective of creating a standard must be to integrate the four elements so that related information scattered among the four parts can be easily cross-referenced. The CAD standard does not address this bigger picture.</p>	<p>In principle this is a good idea and was something that was considered during the Study. It must be remembered however that the CSWD cover all types of construction work in Hong Kong and therefore would need to be linking to a multitude of specifications and standard methods of measurement. The key to linking CAD data with other types of contract documentation is attribute data. The working paper that addressed attribute data concluded that:</p> <ul style="list-style-type: none"> • In conclusion, what started as a discussion on the use of attribute data has focussed on the need to properly integrate CAD systems with all project and work processes. In so doing, the requirement for CAD familiarisation and training at all levels in an organisation is essential. • Unless and until this integration occurs, the use of attribute data will remain limited and its potential will not be realised. • The introduction of the CSWD is an opportunity to help raise the profile of this need within the construction industry in Hong Kong. • It is not recommended that the CSWD contains a lengthy definition of attribute data categorisation at this stage. It is considered that the range of attributes that could be used is too large to document and that the use to which they would be put is undefined at this stage. • Instead, it is recommended that the CSWD contains a statement pointing out the potential benefits of attribute data and also pointing out the need to integrate CAD systems, through training, with all project processes.

Item No.	Comments	Responses
	<p><i>Recommendation:</i></p> <p>Review the contract documentation issue comprehensively. Establish standards regarding specifications, drawings, schedules, BQ and principles on how these are integrated. Ideally this should have been done before the revamping of CAD standards take place.</p>	<p>We hope that, in time, moves towards the integration of contract documentation will take place. But we must learn to walk before we can run. We are sure that the CSWD Committee would be pleased to receive any practical examples of such integration that the HKIA may have.</p>
1.5	<p>Flexibility & Extensibility</p> <p>Concerns also remain on the flexibility and extensibility of the standard in relation to rapid moves in the CAD industry and the need for a degree of autonomy.</p> <p>It is common practice in Information Packaging to include a "Meta-Data" section to any package. Meta-Data is the sub-data of data, (similar to the Preamble of a BQ) enabling explanation of the data structure. In this way it is possible to retain flexibility, (for example to add new folders, lisps, formulae, models of models, layers of layers etc.) as the technology develops beyond the original default folders and settings while retaining the benefits of 'standardization'.</p> <p><i>Recommendation:</i></p> <p>Limit the scope of standardized applications to a basic framework while retaining maximum flexibility for wide ranging applications.</p>	<p>We believe that the standards do address this basic framework as discussed in Item 1 above. It is recognised that CAD software will change rapidly and that the standards must be flexible enough to address these changes.</p> <p>But referring back to Item 1.3, the things that we draw, i.e. the elements, do not change. That is why it was considered necessary to have a comprehensive set of element codes.</p>
1.6	<p>Data Exchange</p> <p>Further to the range of issues discussed, concerns over the integrity and uniformity of key data remains a concern in common practice.</p> <p><i>Recommendation:</i></p> <p>Consider the adoption of a standard 'title block' this could be used to encompass all basic naming and settings information together with standard entry fields for displayed information while giving a tangible 'face' to the CAD Standard. Ideally such a title block would be interactive and could contain further information on revisions etc. in addition to the proposed CSWD 'Standard Interface' and website hyperlink.</p>	<p>If the departments all wish to work to a standard title block, then this might be feasible. Alternatively, the information fields could be incorporated into departments' current title blocks.</p>

Item No.	Comments	Responses
1.7	<p>Data Representations</p> <p>While the range of 'classes' is considered too extensive and should form the subject of further study, we feel there may be some scope in terms of user flexibility to create a simple hierarchy of 'class groups' and 'class layers' suited to common applications. (ie. drawing scales and graphic content might follow standard layer configurations to suit a range of pre-set or user defined preferences, submission procedures etc).</p> <p>The further creation of cells should of course take account of the need for a variety of scalar representations suitable to a defined range of drawing types and plotting scales.</p> <p><i>Recommendation</i></p> <p>To ensure flexibility of the CAD standard to allow user customization of data content</p>	<p>The initial practical application of this would be through a series of templates or predefined layer tables as used by Highways Department and others.</p> <p>Users are encouraged to build up a library of standard definitions to suit their discipline work and project requirements.</p> <p>We consider that the CSWD has the necessary flexibility.</p>
1.8	<p>Data Management</p> <p>While the conventions for storing reference and back-up files are largely governed by software users, some indication of 'good practice' in this area may be beneficial to the study. A simple flow chart mapping a sample project and its utilization by various parties could also be considered.</p> <p>Further consideration may also be given to the con-currency of data. Notwithstanding the inevitable move towards 'live' 3D working files accessible over the internet, some interim measures regarding 'revised' versions of drawings should be clearly established in terms of a 'live' drawing register. Ideally all 'changes' should be graphically highlighted in addition to conventions for 'revision/date' assignments. In this respect, file naming with references to 'date' in addition to 'revision' would be beneficial. Hotlinks to project folders, sub-folders and related files would also be advantageous. As such our concern is not simply for the transfer of data, but the knowledge that all parties are indeed referencing the same set of information.</p>	<p>The range of projects carried out by the departments is large and varied and to describe a 'sample' project is likely to raise more questions than it answers.</p> <p>We are at the early stage of the implementation of the CSWD where the scope is to set a CAD standard for Works Departments to avoid data loss during exchange of data. Although this is a somewhat confined scope, it will nonetheless require immense collaboration and cooperation between the departments and other stakeholders.</p> <p>The development of the CSWD is an on-going process with short and long term targets.</p> <p>We appreciate the HKIA's comprehensive comments and obvious expertise in CAD and believe that many of the ideas presented can be considered to be incorporated into the CSWD once the initial standards have been adopted by the participating departments.</p>

Item No.	Comments	Responses
	<i>Recommendation:</i> To encapsulate the graphic standards within a simple interface, this could take the form of a standard title block with the potential for further interactive functions in due course.	Noted.

Comments on Study on CAD Standard for Works Departments Consultation Document

Prepared by David Fung (LPT Architects) - November 2001 and HKIA - 11 December 2001

No.	Section	Comments/Problems	Suggested Solution	Response
Application Issues				
2.1	Folders Page 7	<p>In Folder "PROJECT#1/ADMIN" it is suggested to store the drawing frames.</p> <p>For small projects or small firms, the correspondences like letters / faxes/ memos may be saved in a folder call "ADMIN" under the same project number. Thus, the naming of "ADMIN" is confusing.</p>	Folder contains drawing title block, grid lines, site boundary shall be called "XREF" or "REF"	<p>All of the participating departments have separate CAD servers, as does Atkins China Ltd, so this ought not to be a problem in those organisations. However, it is recognised that some organisations may store their CAD data with other project data and that a conflict could arise.</p> <p>We consider that naming this folder, which is used for storing standard, project-related drawings, as XREF or REF would also be confusing as it clashes with the XREF term used by AutoCAD users.</p> <p>We would suggest CAD_ADMIN as an alternative name.</p>
2.2	Folders Page 7	In Folder "PROJECT#1/INCOMING" – a hierarchy of naming of folders shall be followed through to maintain a higher degree of differentiation.	<p>Hierarchy:-</p> <p>Incoming \ Companies \ Date</p> <p>Refer to section on naming of folders in the Reference CAD manual</p>	<p>Noted and agreed that this is a good method of subdividing the INCOMING folder. Users are free to sub-divide this folder as suits their organisation and project. We would not wish to make this sub-division system mandatory, but prefer instead to allow users to select their own sub-division method.</p>
2.3	Folders Page 7	<p>In Folder "PROJECT#1/REVISION" – to make copies to store previous versions of files is NOT a good way to handle.</p> <p>In /DRAWING folder, drawings has a lot of reference files referenced into the "Drawing" which compose the sheet. Each model file has its own path attached.</p>	<p>A much better way to store revisions is to use the "Archive" functions:</p> <ul style="list-style-type: none"> In AutoCad – use Pack 'n Go + Path substitution + Zip In Mstation – use Utilities\Archive 	<p>The method suggested was considered to be the simplest way of allowing users to keep old versions of files, while maintaining the integrity of the current data set.</p> <p>There are many other ways of doing this and yours is a good way.</p> <p>Atkins China Ltd's in-house method is to make a back-up of the whole directory structure at milestones in the project.</p>

No.	Section	Comments/Problems	Suggested Solution	Response
		<p>1 By “copying” the drawing & model files into the \REVISION folder involves a lot of copying of files, which some of the files may be missed out during the process.</p> <p>2 The paths for all the model files are still referring to the original \MODEL folder, that means they are referring to the most current model files but not the saved revision. In Microstation, it can be resolved by putting drawing and model files into the same directory. However, that mean 2 files (more if more revisions) with the same file name exist in different folders. This is extremely confusing.</p> <p>3 It is suggested only the “drawing” files to be renamed by adding the revision number as suffix. By doing so, however, disabled the powerful and efficient batch plotting function which rely on the naming of the drawing files.</p> <p>4 By using “copying”, only the drawing and model files are copied. Other files that compose the drawing files such as fonts, settings, plotting settings will not or more likely forgotten to copy. The result is that the recipient of the revision issued can never print out the exact copy of the originator due to the missing fonts and settings.</p> <p>5 Say a project has 200 drawing files and 500 model files. On one revision, only 100 drawings are revised. How do user know what, out of the 500 model files, to copy into the \REVISION folder?</p>	<p>Refer to the Archive section in the Reference CAD manual</p> <p>Advantages:</p> <p>Paths of all model files will be eliminated to reduce file confusion.</p> <p>Zipped to the smallest file size to save file space.</p> <p>There will not be 2 or more files bearing the same name (one in \MODEL folder and one in \REVISION folder) which will cause confusion.</p> <p>The reference structure can be maintained and can be manipulated at a later date.</p> <p>Single and smallest file size to facilitate file transfers between parties via emails/internet.</p> <p>A full record what the previous revisions or issues can be kept either in the network or saved separately. Any file or all files can be retrieved at any time.</p>	<p>The CSWD Brief does not require the setting of Drawing Management practices, merely to make an allowance for them. Given the many different practices in use, we would not wish to force new practices onto departments / organisations for a number of reasons, which include:</p> <ul style="list-style-type: none"> Archiving procedures are often integrated in QA procedures upon which, company certification is obtained – any changes could have significant impacts The different needs of the various organisations affected by the CSWD. The archiving needs of a design company are very different for example to those of a ‘records keeping’ organisation as exist within WSD and DSD. <p>We are sure that your suggestions will be of interest to CSWD Users nonetheless.</p>

No.	Section	Comments/Problems	Suggested Solution	Response
2.4	Folders Page 7	“... in situations where reference links between the two types of files may be lost...” – why is that the links may be lost? Using “ Archiving” described above will not result in lost links. Thus the model files and drawings files should always be split into two folders.	A much better way to prevent lost links is to use the “ Archive” functions. Refer to the Archive section in the Reference CAD manual	Noted
2.5	File naming Page 8	Refer to point 3 above, adding a “ revision” to a file is not a good practice because it hinders the use of automated batch plot utilities existed in both AutoCad and MircroStation.	The drawing files shall always exist without revision status. Only the current set of drawings exist in the drawing folder. Previous issues and revisions, shall be archived using the method described in point 3. Thus there will not have any conflict with the filenames.	Revisions to drawing numbers were added at the request of the participating departments. Your comments on batch plotting are noted but it would not take long to create the necessary text files for batch plotting from a directory listing.
2.6	Layer naming Page 10	There are 999 CSWD elements for the Element Coding Tables – it is impractical to memorize them and even using the table will be troublesome.	The whole table can be customized into the pull down menu both in AutoCad and MicroStation. Customization of menus shall be included in the CAD standardization.	The Standard Interface program will include features for naming to the Element Coding Tables. We still maintain that users will be generally limited to a specific range of codes and will quickly become familiar with those that they use the most.
2.7	Layer Assignment Page 10	An object (line, circle... any drawing element) is defined by 4 attributes – layer/level, line type, line weight and colour. The proposed CSWD uses Element Coding Tables extensively (999 categories) to differentiate the appropriate layer/level, however, the other 3 attributes are not defined. For example, a person drawing a wall at Level 2 and a person drawing a wall at Level 3 may look completely different on screen and on paper. This is because even though they may define the wall correctly (both Class 220 – Internal wall), but the colour, line type, and line weight are not defined in the system and it is up to their own experience to decide. The CAD standardization is not complete.	Same as point 6 above, the whole table can be customized into the pull down menu both in AutoCad and MicroStation. All four attributes can be defined automatically.	We do not see the need to standardise these other attributes and to do so would make the CSWD too rigid to cater for all the types of work that are drawn by and for the participating departments. We are keen not to standardise for its own sake. You will see that many comments on the CSWD say that they are already too complicated. To add other attributes that do not affect data exchange is deemed unnecessary.

No.	Section	Comments/Problems	Suggested Solution	Response
2.8	Drawing Settings Page 11	In order to make the translation between AutoCad and MicroStation work, the Line Thickness Assignment in AutoCad has to be assigned by weight but not by colour. CSWD report said it is not “recommended” to draw in line weight but in fact it shall be worded as “must be” drawn in line weight.	Use of “line weight” but not “colour” shall be strictly reinforced.	The use of the term ‘recommended’ is a hangover from the early days of the Study when ‘recommendations’ were being made. Once the CSWD are fully endorsed by the CSWD Working Group then those items that are mandatory will be described as such.
2.9	Application Page 13	The “standardized” table stated that Text Size varies with different scales. It causes a lot of confusion and it is easy to get mistakes when there are several scales to be drawn in the same drawings or when there are a team of people drawing on the same project. People will be drawing in different sizes.	In AutoCad, text, dimensions shall be drawn in the Paper Space but not Model Space. Thus text size is referred to the size of drawing sheet but not building element. Therefore, it only exists ONE text size across the whole documentation, regardless of the scale of the building contents. In MicroStation, text is drawn in the drawing files but not model file, thus, only ONE text size is enough or the whole documentation.	Both methods are applicable to different ways of working. For drawings with many scales then the Paper Space method is probably best. But when only one scale is used then Model Space is just as good if not better. WSD, for example, draws most of its plans at 1:1000 and places text in Model Space.
2.10	Example Drawings downloaded from the Web	In the title block file, a layer table is attached intended for easy referencing of different layer name. An example of text size is also attached for matching text sizes in different scales. The two pieces of “useful” information outside the title block, however, disabled the function in AutoCad. The Batch Plot Utilities in AutoCad search for the “extent” of information to be plotted. With these “outside” information messing up with the title block, Batch Plot Utilities cannot print the content in a meaning scale. Drawings has then to be plotted one by one, every time. Experience showed that to plot 150 sheets of drawings took a draftsman 4 hours to print, every time! Batch plotting is a key to efficient plotting of drawings. Batch plotting the above 150 sheets takes 2 minutes!	With menu bar customization, the layer table is not needed. With text drawn in Paper Space (AutoCad) instead of model space, the example of text size is not needed. Thus Batch Plot Utilities in AutoCad can be facilitated and hundreds of different drawings can be plotted within minutes automatically. In MicroStation, the Batch plot searches for the property of the title block to define the area to plot, so it is not a concern here.	The Tables were for information only and do not form part of the CSWD.

No.	Section	Comments/Problems	Suggested Solution	Response
2.11	Example Drawings downloaded from the Web	In one of the sample drawings where drawings in different scales appeared in one single drawing, say one in 1:500 and one in 1:100, there exists a lot of problems in text size and dimension text size.	When text and dimensions are drawn in Paper Space instead of Model Space, the text size and dimension text size are independent of the drawing elements and it is no longer a problem.	Please see response above regarding use of Paper Space and Model Space.
2.12	Example Drawings downloaded from the Web	The section draw bears no relationship with the plans. Checking the accuracy of drawing is difficult. Incapable of keeping track on changes. Say change in plan cannot be reflected in change in section.	A controlled set up of the relationships between plan, section and elevations are of paramount importance. Refer to the "Magic Square" set up approach in the Reference CAD manual.	The 'Magic Square' is a good method of composing drawings of buildings but is not so applicable to civils drawings. The section and plan were to demonstrate the structure of the CAD data only, not the accuracy of the drawing.
Other Important Issues to be addressed in the CAD Standard				
3.1	File Transfer	CAD standard shall include procedures to transfer drawings to 3 rd parties by means of: Archiving Procedure Procedures to convert between MicroStation and AutoCad Files Be reminded that problems in converting paper space objects and MicroStation objects has to be resolved.		Transferring CAD data will be addressed in the final version of the standards although it will concentrate on ensuring the completeness of the data rather than the method of transfer. For example, archiving procedures would not be applicable if just transferring a single model file.
3.2	Use of Paper Space & Model Space (AutoCad)	Advantages of drawing in two spaces: Facilitate batch plotting Single text size through whole documentation because text size related to sheet but not model, thus different scaled drawings thus not affect text font, there is no need to have example text size attached to the Title block File Making use of drawn information to produce drawings in different scales. Refer to Different Scale section in the Reference CAD Manual.		Comments are noted but do not suit everyone's way of working. Many of these comments related to procedures, which although important, are not necessary to define to meet the objectives of the CSWD. Imposing standards for naming on the construction industry is a significant first step. To impose standard procedures that all companies / organisations must follow would be too much at this stage. You have obviously spent a lot of effort in developing a good set of procedures to suit your company's way of working. You would not appreciate us imposing new procedures on you.

No.	Section	Comments/Problems	Suggested Solution	Response
3.3	Cautions in Referencing	<p>Using drawing files and model files means the use of Xreferencing (AutoCad) or Reference (MicroStation), however, there are certain criteria a drawing shall be set up to make the referencing effective:</p> <p>Plan at all levels shall be lay on top of each other</p> <p>A common Global Origin shall be specified across all plans</p> <p>Other cautious reminder shall be included in the standard such as:</p> <p>In AutoCad, it shall be reminded that Discourage use of “overlay” but use “attachment”</p> <p>The importance to outline the traps is that change in one drawing will trigger changes in potentially hundreds of drawings. So the procedure must make it right for the first time.</p>		<p>Agreed.</p> <p>Agreed.</p> <p>Depends on the situation</p> <p>Agreed – it is important to think about how a project will be set up at its outset.</p>
3.4	Gridlines	Insufficient layer break down for grid lines in element 020-029. Intelligent use of grid line system can increase efficiency and reduce the chance of making mistakes. Refer to the Gridline Section of the Reference CAD Manual		Refer to our responses to the Reference CADD Manual.
3.5	Different Scale of Details	By using existing drawing elements, additional information shall be drawn on model space, while paper-space drawn text, dimension. Refer to Different Scale section in the Reference CAD Manual.		Noted.

No.	Section	Comments/Problems	Suggested Solution	Response
Implementation Issues				
		<p>The CAD standard for Works Department (CSWD) is based on AutoCAD 2000 and Microstation SE or J. For AutoCAD however, many practices are still using R14. There are certain AutoCAD 2000 features that are not available in R14 e.g. Line Thickness. Besides, upgrading to AutoCAD 2000 can mean considerable cost. It is therefore suggested to use R14 as the 'de facto' base.</p> <p>Different practices adopt different CAD file naming, layers naming conventions. Most of them are intended to be user-friendly. The names tend to be literal and require least deciphering. The CSWD file and layer naming conventions are derived from the BS1195 : Part 5 of 1998, Construction drawing practice - Guide for the structuring and exchange of CAD data and the RIBA CI/SfB coding systems. It is a good intention to rationalize information transfer; to create a common user environment; to give users guidance in structuring their drawing file and to provide a structure for quality control over users drawings. It is also understood that the coded elements also open the option of transferring the CAD drawing data to other software packages for analysis, measurement etc. However, the coding systems cannot be regarded as user-friendly.</p> <p>User-friendly on screen menus in the form of customized filters or LISP routines for different disciplines are required to improve the efficiency and usability of the coding system.</p>		<p>The requirement of the brief was to produce the CSWD for Departments current CAD software, and to make measures for future software. Departments currently use AutoCAD 2000 and Microstation SE or J. The CSWD takes advantage of a lot of the improvements, which were incorporated, into these versions of the software such as the AutoCAD lineweights. We would not wish to hold back progress by not taking advantage of the latest tools at our disposal.</p> <p>As has been proved by the CSWD Trial, once users start using the CSWD Element codes they become familiar with them very quickly. Organisations can further assist users in familiarising themselves with the CSWD Element codes by producing standard layer tables for their particular field of work.</p> <p>Agreed, the CSWD standard interface will meet this need.</p>

No.	Section	Comments/Problems	Suggested Solution	Response
		<p>The CSWD sets out standards on 'FOLDERS', 'FILE SETTINGS', 'FILE NAMING', 'LAYER NAMING', 'LAYER ASSIGNMENT', 'DRAWING SETTING' and 'PLOT SETTING' which form the basis of creating and managing Model files for individual disciplines. The CSWD however says little on the data exchange and the output of CAD files for collaboration.</p> <p>In conclusion, we recognize that currently different practices are having their own standards and conventions. They may not be bad, they may not be good, they are just how they work and what they consider suit them. On the other hand, we welcome the establishment of standards built on a widely recognized paradigm for seamless exchange of information. We would like to see that the standards could be extended to other Government departments or even to the whole Hong Kong construction industry.</p> <p>Attention should however be paid to the likely costs to participants. It is well known that CAD software packages and upgrades are expensive. Thus, the standards should preferably be as generic as possible and downward compatible.</p>		<p>We would not categorise the data exchange process as a CAD Standard so have not included it in the CSWD. We have dealt with the data exchange process separately and will be producing a separate set of guidelines for this.</p> <p>Agreed, this would be beneficial to all CAD users in Hong Kong. We note that KCRC, MTRC and the Hong Kong Housing Authority are all taking a very keen interest in the CSWD and have all expressed a willingness to align their standards with the CSWD if possible. These three parties are currently all in the process of reviewing their CAD manuals so we look forward with anticipation in seeing the results.</p> <p>Agreed, although as mentioned above we should not hold back progress simply because not everyone is using the latest CAD software. Where improvements are made to software it is important that we exploit these opportunities and take maximum advantage of these improvements, as will be the case with Microstation Version 8. Although we note care should be taken, and a collective approach should be taken with such issues. This is where the CSWD committee will come into practice, as it the committee who will be responsible for updating the standards as and when the needs arise, such as when new versions of software are released.</p>

DRAFT REVISED CADD MANUAL for a Model project P:\00062 - prepared by David Fung of LPT Architects.

Ref		Consultant' s Response / CSWD Equivalent
1	<p>DIRECTORY STRUCTURE</p> <p>Archive Store all issued drawings, zipped. Naming = date + description</p> <p>Plot Plot settings and Batch plot list</p> <p>Dwg AutoCad design files only, e.g. all plans, sections, elevations, details</p> <p>Dgn MicroStation design files only</p> <p>Sheet Stores plotting files, only text, dimension and title sheet information, all others are reference files</p> <p>Xref Reference files such as boundary, title block, site plans, all separate file</p>	<p>We respond by giving the CSWD equivalent to LPT's standards. We believe these demonstrate how easily the CSWD can be adopted into existing CAD practice.</p> <p>\\REVISION</p> <p>\\CAD_ADMIN</p> <p>\\MODEL</p> <p>\\MODEL</p> <p>\\DRAWINGS</p> <p>\\CAD ADMIN</p>
2	<p>FILE NAMING</p> <p>Files stored under Dwg / Dgn sub-directory</p> <p>A_plan_Lxx (a = architecture; L = Level; xx = B1 – Basement 1, 00 – ground, 01 – first Rf- roof)</p> <p>A_elev_x (x = 1, 2, 3... different elevations)</p> <p>A_sec_x (x = 1, 2, 3.... different sections)</p> <p>Files stored under Sheet sub-directory</p> <p>e.g. 062D034 – detail working set</p> <p> 062S034 – BD submission</p> <p>Files stored under Xref sub-directory</p> <p>e.g. a_boundary</p>	<p>\\MODEL</p> <p>A_P_LXX__N</p> <p>A_E_X</p> <p>A_S_X</p> <p>062D034</p> <p>062S034</p> <p>\\CAD_ADMIN</p> <p>A_P_BOUND</p>

Ref		Consultant' s Response / CSWD Equivalent
	a_site_plan sec_grid – magic square grid Grid_100 Grid_50	A_P_SITE A_P_MAGIC A_P_G100 A_P_G50
3	SETTINGS For every project, an initial set up is of paramount importance. Pull down menu customization shall be set up to define all the setting subject to client's agreement. Station LPT pull down customization shall be initiated.	Agreed that it is essential to agree the application of the standards at the start of a project. Pull-down menus will be provided under the Standard Interface.
4	‘ MAGIC SQUARE’ APPROACH All drawings set to true co-ordinates, if possible All plan to lay on top of each other Establish the following Relationships: <ul style="list-style-type: none"> - Plan – Plan relationship - Plan – Section Relationship - Plan – Elevation Relationship - Elevation – Elevation Relationship - Section – Section Relationship - Elevation – Section Relationship Text Title Block Coloring Note in Xreferencing, use “ Overlay” instead of “ Attachment” , do not use “ Specify on Screen”	Agree Agree Agree Agree Agree Agree Agree Agree Agree Contradicts previous statement. Most suitable method for the project should be adopted.

Ref		Consultant' s Response / CSWD Equivalent																																										
5	<p>DIFFERENT SCALES</p> <p>Xref of different raw drawings i.e. from dwg/dgn sub-directory</p> <p>Use Xclip (AutoCad) or Clip Boundary (Mstaion) to display portion of useful information of the dwg/dgn files.</p> <p>AutoCad – Details in model space of sheet files</p> <p>Microstation - Details drawing in different file under “Dgn” sub-directory</p>	Use the most appropriate methods to suit the project.																																										
6	<p>GRIDLINE (STORED IN “XREF” SUB-DIRECTORY)</p> <p>Separate gridlines, bubbles and text</p> <p>Some typical names:</p> <table><tr><td>V-BUB</td><td>Vertical Bubble</td><td>A_0252V</td></tr><tr><td>V-DIM</td><td>Vertical Dimension</td><td>A_031_V</td></tr><tr><td>V-LINE</td><td>Vertical Grid line</td><td>A_0251V</td></tr><tr><td>V-TXT-N</td><td>Vertical Text in N direction</td><td>A_0261V</td></tr><tr><td>V-TXT-E</td><td>Vertical Text in E direction</td><td>A_0262V</td></tr><tr><td>V-TXT-S</td><td>Vertical Text in S direction</td><td>A_0263V</td></tr><tr><td>V-TXT-W</td><td>Vertical Text in W direction</td><td>A_0264V</td></tr><tr><td>H-BUB</td><td>Horizontal Bubble</td><td>A_0252H</td></tr><tr><td>H-DIM</td><td>Horizontal Dimension</td><td>A_031_H</td></tr><tr><td>H-LINE</td><td>Horizontal Grid line</td><td>A_0251H</td></tr><tr><td>H-TXT-N</td><td>Horizontal Text in N direction</td><td>A_0261H</td></tr><tr><td>H-TXT-E</td><td>Horizontal Text in E direction ...</td><td>A_0262H</td></tr><tr><td>H-TXT-S</td><td>Horizontal Text in S direction ...</td><td>A_0263H</td></tr><tr><td>H-TXT-W</td><td>Horizontal Text in W direction ...</td><td>A_0264H</td></tr></table> <ul style="list-style-type: none">• Make copies of different scale of the same grid file• Use same gridline reference in all plans, section, elevations and details by switching off unnecessary layers/levels.• Rename path to change grid scale	V-BUB	Vertical Bubble	A_0252V	V-DIM	Vertical Dimension	A_031_V	V-LINE	Vertical Grid line	A_0251V	V-TXT-N	Vertical Text in N direction	A_0261V	V-TXT-E	Vertical Text in E direction	A_0262V	V-TXT-S	Vertical Text in S direction	A_0263V	V-TXT-W	Vertical Text in W direction	A_0264V	H-BUB	Horizontal Bubble	A_0252H	H-DIM	Horizontal Dimension	A_031_H	H-LINE	Horizontal Grid line	A_0251H	H-TXT-N	Horizontal Text in N direction	A_0261H	H-TXT-E	Horizontal Text in E direction ...	A_0262H	H-TXT-S	Horizontal Text in S direction ...	A_0263H	H-TXT-W	Horizontal Text in W direction ...	A_0264H	<p>If this level of detail is needed, then the following Layer / Element Coding could be used</p> <p>Users can adopt their familiar working practices</p>
V-BUB	Vertical Bubble	A_0252V																																										
V-DIM	Vertical Dimension	A_031_V																																										
V-LINE	Vertical Grid line	A_0251V																																										
V-TXT-N	Vertical Text in N direction	A_0261V																																										
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V-TXT-S	Vertical Text in S direction	A_0263V																																										
V-TXT-W	Vertical Text in W direction	A_0264V																																										
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H-DIM	Horizontal Dimension	A_031_H																																										
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H-TXT-W	Horizontal Text in W direction ...	A_0264H																																										

Ref		Consultant' s Response / CSWD Equivalent
7	TABLES Use Excel for tables and BD calculations such as: GFA/UFA Site Coverage / Plot Ratio Car parking... Drawing list Material	Users can adopt their familiar working practices
8	ARCHIVING PROCEDURE LPT MUST archive immediately every single drawing that has been issued. (Otherwise, changes in the Model files will update all drawings afterwards) Do NOT simply copy the working set and dump into the Archive sub-directory, this will create a lot of confusion by having the same filenames over different folders.	Agreed that this is a good practice Agreed – better to remove archived files from the system
	AutoCAD Step 1 - Pack' n Go – save all related file in a temporary folder - Open the first file you want to archive - From pull down menu, click “Express\Tools\Pack'n Go” - A menu of all of the design file/reference files/fonts/printer settings will pop up that compose this sheet. - In “ Copy to” box, specify a temporary folder to save all the above files - Repeat the procedure until all the sheet files that you want to archive are saved in the temporary folder. - Because all the files that compose the archive are saved under the same temporary folder, repetitive files for the whole archive such as grid, site plan, boundary lines, title block will only exist once, hence the minimum number of files are saved.	Users can adopt their familiar working practices

Ref		Consultant' s Response / CSWD Equivalent
	<p>Step 2 Path Substitution</p> <p>All the sheet files saved in the temporary folder, however, still link to the reference files in the original job directory. This is not acceptable because</p> <p>3rd party receive the archive file cannot reestablish the reference structure;</p> <p>the purpose of archiving is to make a frozen “ snap shot” of the drawing issued but not he current working file, hence, it is necessary to delink all the paths of the reference files in each sheet file</p> <ul style="list-style-type: none"> - Open the first file that you have saved using “Pack’n Go” in the temporary directory - From pull down menu, click “Express\Tools\Path Substitution” - Specify all the paths to be substituted by pressing * - Substitute with “ nothing” – simply by pressing the Enter key - All the path will be delinked, i.e. the sheet file will not search for the reference files in the same folder. <p>Step 3 - Zip the files and put into the archive sub-directory using name described below</p> <p>To retrieve – unzip into a temporary directory</p> <p>Do NOT use “ BIND” function.</p> <p>Advantages of this method over the text-book “ bind” method or copy the whole directory are:</p> <p>Reference structure remains – manipulation possible at later stage</p> <p>Absolute minimum number of files that are necessary to compose all the sheet files, no repetition of the same information.</p> <p>Every thing essential to reproduce an exact duplicate of drawing are saved, sheet files, reference files, fonts and even plotter settings! Any recipient of the archived file can print out the same quality – no much mismatched fonts/thickness/line type.</p> <p>As the archived file are named specifically (see next section), there is no duplication of filenames that cause confusion</p> <p>Emailing only one single zipped file to others</p>	

Ref		Consultant' s Response / CSWD Equivalent
	<p>MicroStation</p> <p>Under Utilities/Archive function Note: Never specify " Save Directory" using name described below</p> <p>To archive,</p> <ul style="list-style-type: none"> • Open any MicroStation file • From pull down menu, select Utilities\Archive, an archive dialogue box pops up • From pull down menu of the dialogue box, select File\New, to create an archive file in the project archive folder, use the naming system described below • Select all the sheet files to be archived then choose Add • Remember NOT to check on " Save Directory" Option • Check on " Reference file" • Keep on hitting " OK" until it starts archiving • The function save all drawing files, model files, fonts, settings, plot drivers... into one Archive file specified in point 3, to its minimum size (it will zip auto) <p>To retrieve,</p> <ul style="list-style-type: none"> • Open any MicroStation file • From pull down menu, select Utilities\Archive, an archive dialogue box pops up • From pull down menu, select File\Open, open the archived file • Select all archived files to be extracted then choose Edit\Extract • Remember to extract to a temporary folder, not extract back to the current network folder • Open those filed in the temporary folder as normal MicroStation files <p>Naming of archived file 20011005_tender issue Date+ description</p>	Users can adopt their familiar working practices
9	<p>BATCH PLOTTING</p> <p>Batch Plot Utility – separate application in the AutoCad directory</p> <p>Utilities\Batch Plot function in Mstation</p> <p>Note: Use separate filename for each individual drawing in accordance to LPT's ADS manual</p>	Users can adopt their familiar working practices

APPENDIX G

DATA TRANSFER TEST DRAWINGS

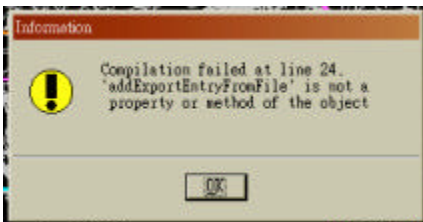
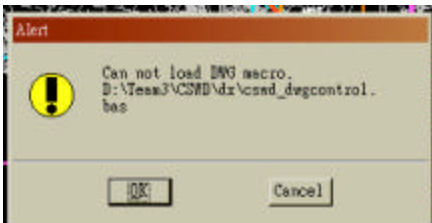
APPENDIX G – DATA TRANSFER TEST DRAWINGS

KHC1010x-GL0001	General Layout	CSWD Microstation Trial
KHC1010x-GL0001	General Layout	CSWD AutoCAD Trial

APPENDIX H

RESPONSES TO COMMENTS ON THE TRIALS

APPENDIX H – RESPONSES TO COMMENTS ON THE TRIALS

Dept	Reference	Department' s Comment	Consultant's Response
HyD/MW (Y W Yeung)	1	<p>We cannot complete the testing on the CSWD file import/export process; according to the instructions as stated in the CSWD_01.doc file. We found that when we tried to export the file to DWG format and load the CSWD_DWGCONTROL.bas file, an error message was prompted, which stated a message of :</p>  <p>When we clicked the "OK" button, another message of:</p> 	<p>Apologies for the confusion surrounding the CSWD_DWGCONTROL.bas file. Hopefully we have now got to the bottom of it. Bentley released 9 versions of Microstation J :</p> <p>07.00.01.11 07.01.00.62 07.01.00.66 07.01.01.36 07.01.01.42 07.01.01.48 07.01.01.57 07.01.04.07 07.01.04.10</p> <p>Unfortunately the DWGCONTROL.bas file which is supplied with these versions is not generic, and it is this which has lead to users getting error messages when loading the CSWD_DWGCONTROL.bas file which we provided for the CSWD trial. The simplest way to resolve this is to do the following:</p> <ul style="list-style-type: none"> • Copy all files from BENTLEY/HOME/PREFS/DWGDATA to CSWD/DX • Add the following 4 CSWD mapping tables which you have been provided with to CSWD/DX <p>CSWD_FONT.tbl CSWD_WTWD.tbl CSWD_WTW1.tbl CSWD_WTW2.tbl</p>

Dept	Reference	Department' s Comment	Consultant's Response
HyD/MW (Y W Yeung)	2.	<p>Due to these errors, we cannot continue the testing on this process.</p> <p>We noticed that two files are missing (dwghatch1.tbl & dwghatch2.tbl) while running the CSWD_DWGCONTROL.bas file.</p>	<ul style="list-style-type: none"> Rename the DWGCONTROL.bas file in the CSWD/DX folder to CSWD_DWGCONTROL.bas Using the find and replace command in <i>notepad</i> or <i>word</i> amend the following four items in the new CSWD_DWGCONTROL.bas file: FONT.tbl replace with CSWD_FONT.tbl WTWD.tbl replace with SWD_WTWD.tbl WTW1.tbl replace with CSWD_WTW1.tbl WTWT.tbl replace with CSWD_WTW2.tbl Save the changes to CSWD_DWGCONTROL.bas <p>You will now be able to load the CSWD_DWGCONTROL.bas file and conduct the data exchange process following the step by step instructions for importing and exporting drawings, which has all ready been forwarded to you.</p>
HyD/MW (Y W Yeung)		<p>Also the following path for searching the defined files are not matching with existing directory structure of Microsatation:</p> <p>Begin Auto Edit</p> <p>MbeLevelTable.addImportEntryFromFile "E:\Bentley\Home\prefs\dwgdata\dwglevel.tbl", "MASTERFILE"</p> <p>MbeWeightColor.addImportEntryFromFile "E:\Bentley\Home\prefs\dwgdata\dwgwtco.tbl"</p> <p>MbeLineStyle.addImportEntryFromFile "E:\Bentley\Home\prefs\dwgdata\dwgline.tbl"</p> <p>MbeColorTable.addImportEntryFromFile "E:\Bentley\Home\prefs\dwgdata\dwgcolor.tbl"</p> <p>"MbeCharTable.addImportEntryFromFile "E:\Bentley\Home\prefs\dwgdata\dwgchar.tbl"</p>	
HyD/MW	3	In order to continue the testing, we modify the CSWD_DWGCONTROL.bas file to	

Dept	Reference	Department' s Comment	Consultant's Response
(Y W Yeung)		fit our existing directory structure of Microstation, (i.e. C:\). However, we cannot guarantee the contents of output are correctly produced even the output file is created.	
HyD / R&D (Stephen Lo)	Background	<p>According to the proposed Standards stated in the Consultation Document, the trial was undergone starting from mid November, 2001 by both Structures and R&D Divisions.</p> <p>The trial was implemented under the CAD Document Management System (CDMS) environment in Structures Division. Two drawings were produced: General Layout & General Arrangement. The followings are the findings during the trial.</p>	<p>Noted.</p> <p>Noted.</p>
HyD / R&D (Stephen Lo)	Findings and Recommendations Directory Structure	<p>In order to implement the Standards under the CDMS environment, the <CSWD> main folder was created in the client PC outside the CDMS while the <Project> folder was created under the directory inside the CDMS. It was so arranged because the path link for the resources and setting files could not be setup directly in CDMS.</p> <p>General speaking, there is no sign of conflict or difficulties for creating the Standard folders under our CDMS environment.</p>	<p>Noted.</p> <p>Good, one of our primary objectives in setting the CSWD was to minimise the impact it would have on Departments current practice.</p>
HyD / R&D (Stephen Lo)	File Settings	<p>Because of the shortage of time, only 2D files were created instead of 3D. Besides, users are very concern of the creation of 3D drawings since they were trained for 2D drafting only. On the other hand, they had tried some 3D drawing in MicroStation before and found that there were some problems encountered while a 2D projection produced directly from a 3D model.</p> <p>Recommendation:-</p> <p>In order to allow the CAD users to grasp the technique of 3D drafting, Microstation 3D training should be provided for all the CAD users in the Department.</p>	<p>Noted</p> <p>Agreed.</p>

Dept	Reference	Department' s Comment	Consultant's Response
HyD / R&D (Stephen Lo)	File Naming	<p>Users concerned that the proposed length (6 characters) of the File ID reference in the File Naming Convention for Model Files was impractical for their actual implementation because they normally will have hundreds of drawings for their project. For example, if a 1:1000 base map (original filename: b15ne12a) is referenced to the master drawing, the possible way to name the Model file is to replace the File ID reference with " b15ne12a" which is 8 characters in this case. It is impossible to replace it with any other characters for that base map.</p> <p>Recommendation:-</p> <p>The File ID reference should be extended to 8 characters long (minimum).</p>	<p>We had to draw a line somewhere and the CSWD trial would appear to demonstrate that the majority of Departments are able to define logical File ID Reference's using 6 characters. In regard to the example you give, we would not recommend renaming base map files or any other third party files as you will lose the automatic update mechanism which exists when receiving new versions of these files if they retain their original file name.</p>
HyD / R&D (Stephen Lo)	Layer Naming and Assignment	<p>The CAD users sometimes could not grasp precisely which is the correct element category or element code to be assigned to the elements. For example, when he draws the purlin to the structural steel frame of a footbridge roof. He doesn't know whether he should choose code number 279-Parts and Accessories under category "Structure Primary Elements" or code number 379-Parts and Accessories under category "Secondary Elements, Completion of Structures".</p> <p>Besides, it is a very time consuming job to manipulate the Layer Assignment by just using standard MicroStation manual. Only level number is displayed on the Microstation menu bar. Level assignment for elements is difficult by referring only the level number. Users should have to call up the Level Name popup menu bar (which shows the level names clearly) for layer / level assignment for the elements.</p>	<p>Element code 279 should be used, as a general rule:</p> <p>Classes 200-299 should be used for elements that are structurally required to keep the structure standing.</p> <p>Classes 300-399 should be used for elements that are not structurally required to keep the structure standing.</p> <p>Once users start working to the CSWD they will become much more familiar with the CSWD element codes and the choice of which codes to use. Where situations arise like the example you give it is more important that users make a decision and apply it consistently to that particular project, rather than be to concerned as to whether it was the correct decision.</p> <p>It is proposed that the standard interface will have a layer name wizard which will assist users in the creation and manipulation of layer names.</p>

Dept	Reference	Department' s Comment	Consultant's Response
HyD / R&D (Stephen Lo)	Recommendations:		
	1	For consistency and easy management, we recommended to standardise the use of Layer Number in our Department. It is to ensure that the use of element code in different drawings in our offices is consistent. The document of RD/IT/03A should be amended to align with the CSWD and should be the guideline for the layer assignment in the Department. Besides, the use / meanings of the element coding should be elaborated clearly to provide correct application of element codes.	Noted, it is envisaged Departments such as HyD who currently have standard level assignment tables will simply furnish these tables with CSWD layer names.
HyD / R&D (Stephen Lo)	2	It is strongly recommended that a custom palette / tool bar should be designed having a pull down manual or pick list so that the CAD users can easily pick his desired " Layer Name " during drafting.	It is proposed that the standard interface will have a layer name wizard which will assist users in the creation and manipulation of layer names.
	Drawing Settings	For some presentation drawings, lines are intentionally overlaid each other to give more attractive impression. Therefore, a variety of line thickness is necessary. Recommendation: We recommended to add 3 more line thickness (1.25mm, 1.5mm & 1.75mm) in between 1.00mm to 2.00mm.	It is felt that the current line thicknesses specified in the CSWD are adequate for working drawings, it is not intended for the CSWD to be applied to Presentation Drawings. The addition of 1.25mm, 1.50mm and 1.75mm line thicknesses to the CSWD would have implications on the CSWD data exchange process as AutoCAD does not have these line thicknesses in the default lineweight settings box.
HyD / R&D (Stephen Lo)	Plot Settings	Two plotted drawings were produced through the use of plot files submitted by the Consultant. No sign of error was encountered for the copies.	Noted, hopefully this demonstrates the ease with which users will pick up the CSWD and the fact that the CSWD is not a lot different

Dept	Reference	Department' s Comment	Consultant's Response
HyD / R&D (Stephen Lo)	Conclusions	During the CSWD Trial, we have measured that an extra time of about 30% is required in order to complete the same drawing compared to our traditional way of drafting. Most of the additional time was spent on the operation of " Layer Assignment" . When the implementation of CSWD takes place in the future, even with the customised tool provided, additional manpower resource and intensive training should be required in order to complete the task in time.	As with all things new there is an initial learning curve where users will take time to familiarise themselves with the CSWD, in particular the CSWD element codes. Hopefully, the trial has proved just how quickly users do become familiar with the CSWD after a short time of use. It is envisaged that the standard interfaces layer name wizard will greatly assist users in layer assignment tasks.
HyD / RDO (Tao Ming Chung)	1	<p>When I attach the setting file cswd_dwgcontrol.bas for export to AutoCAD format file. I get message as following:</p> <p><i>Information message: "Execution failed at line 20. Error: 1930."</i></p> <p><i>DWG / DXF Export - Version 7.1.2.8, CSWD_DWGCON_EXT unloaded; Alert message: "Can not load DWG macro."</i></p> <p>After I amended the dwgcontrol.bas file into xxabc.bas by revising those statement containing "*.tbl" to include the full path, the export was succeeded.</p> <p>The later reference model files had overwritten the previous file, if they had the same file names.</p> <p>Also, the exchange setting was not compatible to our CSWD system requirement. It could not identify the reference model file in different project's folder after exchanged.</p>	<p>See previous response to data exchange problems</p> <p>The CSWD recommends that the live model files name remains the same through out its life cycle. This will enable the automatic update of all drawings which reference this file if you receive updated model files from third parties as they will override the previous version. If you wish to keep previous versions of model files we suggest you move the previous version of the model file to the REVISION directory and append the revision status to the end of the filename.</p> <p>We have recommended that all exchanged drawing files and model files are stored in the same folder. This will enable the drawing files to automatically locate the model files.</p>
HyD / RDO (Tao Ming Chung)	2.	Mostly we will attach the alignments and stations from various railway projects, so we wish the project code should be included in File Naming Convention e.g. Model file ID reference.	Noted, we have had a number of requests for this and now propose adding an 8 character alphanumeric project ref to the CSWD model file naming convention.

Dept	Reference	Department' s Comment	Consultant's Response
HyD / RDO (Tao Ming Chung)	3.	When I attach the setting file xxabc.bas for import AutoCAD file, I get the status message: "Unable to open table file: No file name!", then I follow the steps to import AutoCAD drawing. I found many settings of the drawing were changed. They are as following:	See previous response to data exchange problems.
	3.1	Chinese Text cannot display properly. e.g. Chinese Text (FT=179 ch_m_sun) are changed to English Text (FT=3 Engineering).	Chinese Font 179 is not part of the CSWD so will not convert properly during the data exchange process. The CSWD supports the following Chinese Fonts: LANDS Chinese Font: BFHEIN2101.ttf Font 115 in CSWD_FONT.rsc CSWD Chinese Font: This font is still to be created, but will be a MING style font which will exist in TTF format and will be added to the CSWD_FONT.rsc file, Font number to be decided. These two Chinese Fonts will convert sucesfully during the CSWD data exchange process.
	3.2	Standard Width for English Text (0.8 x Text Height) are changed and different to original scale.	When you use the CSWD mapping tables this will convert successfully. See previous response to data exchange problems.
	3.3	All line weight are changed to zero.	When you use the CSWD mapping tables this will convert successfully. See previous response to data exchange problems.
	3.4	All line style are changed to continuous type.	When you use the CSWD mapping tables this will convert successfully. See previous response to data exchange problems.

Dept	Reference	Department' s Comment	Consultant's Response
Chief Engineering/ Lighting (W T Chan)	Folders	Please be informed that the comment for the trial of CSWD are as follow : Acceptable. IT notes may need to be revised.	Noted, one of our primary objectives was to make the CSWD flexible to allow Departments scope for incorporating some of their existing standards and practices into the CSWD.
	Settings	Acceptable. Similar to existing practice.	Noted, one of our primary objectives was to incorporate as much of the Departments current standards as possible into the CSWD.
	File Naming	It should use a whole directory (include the project name) to distinguish between different files with a same file name.	Noted, with have had a number of requests for this and now propose adding an 8 character alphanumeric project ref to the CSWD model file naming convention.
	Layer Naming	Acceptable. IT notes may need to add the element coding system.	Noted, hopefully this demonstrates that the CSWD is not a great deal different from existing practices currently used in the industry.
	Layer Assignment	Acceptable. The level names in annex A of RD/IT/03 need to be revised.	Noted, we envisage that departments such as HyD who all ready have well established " level setting tables" can simply update the current level name in these tables with the relevant CSWD layer name.
Chief Engineering/ Lighting (W T Chan)	Drawing Setting	Acceptable for the line thickness standard, English font standard, fonts width factor standard and colour table standard. Line style standard has not been specified and Chinese font standard to be determined.	Noted. The line style standard has been addressed as part of the drawing symbol data base where we have rationalised and categorised Departments drawing symbols and linestyles. A MING style CSWD Chinese Font set will be created in due course.
	Plotting Settings	Acceptable. The plotter's driver can cater the settings.	Good, one of our primary objectives in setting the CSWD was to minimise the impact it would have on Departments current practice.
	Application #1	Acceptable.	Noted.
	Application #2	No comment.	Noted.
	System Requirements	Applicable.	Noted.
	Others	The sample program "CSWD_DWGCONTROL.BAS", which provided by consultant, could not be attached onto the MicroStation for trial run. It leaded that the Data Exchange between MicrosStation SE/J and AutoCAD 2000 could not be evaluated by us.	See previous response to data exchange problems.

Dept	Reference	Department' s Comment	Consultant's Response
HyD / CE/TMCA (Daniel K L Man)		<p>I refer to your above-quoted memo.</p> <p>This office has conducted some trial use of the seed files provided in CD-ROM via your memo of 12.11.2001 of even series. The settings of the seed files are similar to our normal setting and therefore no specific problems have been encountered in file retrieval and CAD operations.</p> <p>However, there were problems in printing the drawings. While normal plotting of the drawings by plotter presented no problems, printing by HP Laserjet A3 size printer was not successful. Although the scale of the drawings remained the same, only half of the A3 paper was printed. Grateful for advice if the plotter drivers. CSWD_hs.plt and CSWD_fs.plt support printing in laserjet printer.</p>	<p>Noted, one of our primary objectives was to incorporate as much of the Departments current standards as possible into the CSWD.</p> <p>A sample lazer jet plot configuration file has now being created for the CSWD. This will be distributed to all Departments on completion of the study along with all the other CSWD files. This file was emailed to HyD on 7th December 2001 along with some guidelines.</p>
HyD / KLN (Patrick Ho)	1.	There is no user guide for the test. It is very difficult for the users to have a comprehensive testing in the CSWD trial. In fact, our testing staff does not know how to perform the trial test.	An explanation of the CSWD Trial was given in Final Working Paper No.4A – Consultation Plan and to C S Cheuk at HyD's offices on 12 November 2001.
HyD / KLN (Patrick Ho)	2.	The level name is not easy for the user to familiar with, it would take a longer time than expected. For example, the drawing in the demonstration, the acphwaytnn.dgn with a level name AC823_. I wish to know why it is not H_823_? I understand that the level name is not yet fixed in this moment. Hopefully it would be solved if the standard interface or a softcopy of mapping table were prepared.	<p>As with all things new there is an initial learning curve where users will take time to familiarise themselves with the CSWD, in particular the CSWD element codes. Once users start using the CSWD for sustained periods the CSWD layer naming convention and the element codes will become second nature to them.</p> <p>As stated in Working Paper 3 and the Consultation Document the CSWD layer name comprises of 3 fields. The First field is the Agent e.g. the organisation who created the data. For the purpose of the demonstration Agent code AC was used to represent Atkins China Ltd as we created the data.</p> <p>The CSWD layer naming convention is fixed, although the CSWD element coding tables have provision for future expansion as it is envisaged that the element codes will need to be expanded on to incorporate new Construction Elements and Equipment in the future.</p> <p>It is proposed that the standard interface will have a layer name wizard which will assist users in the creation and manipulation of layer names.</p>
HyD / KLN (Patrick Ho)	3.	The data exchange file CSWD_DWGCONTROL.bas is not working. (i.e. it cannot convert from MicroStation to AutoCAD or vice versa.)	See previous response to data exchange problems.

Dept	Reference	Department' s Comment	Consultant's Response
HyD / KLN (Patrick Ho)	4.	Standard CSWD cell have not given to us yet, the directory 'symbol' is empty.	Noted. As required in the brief, the standard drawing symbols have been rationalised and categorised and are now held in a Drawing Symbols Database in BMP format only. We are currently in discussions with WB to produce all drawing symbols in both AutoCAD and Microstation format.
HyD / KLN (Patrick Ho)	5.	We use the print plot file, CSWD_fs.plt and CSWD_hs.plt, supplied by Atkins for printing. However the printout is different from what we expected. Also there is no I-plot print file for us to print an expected output.	<p>As stated in the correspondence which was sent with the CSWD Trial Files, the two Microstation plot configuration files which were provided were:</p> <p>Sample Plotter Configuration Files for Hp-GL/2 Plotters/Printers for both full size (CSWD_FS.plt) and half size (CSWD_HS.plt) plots.</p> <p>As stated in the correspondence, Departments who are currently using other types of plotters/printers and/or third party software such as IPLOT to plot their drawings can make a copy of their current plot settings files and update the copied version with the following CSWD settings:</p> <p>CSWD Paper Sizes</p> <p>CSWD Line Weights</p> <p>CSWD Grey Scales</p> <p>(These settings were highlighted in the word version of the plot configuration files which were emailed to you at the beginning of the trial)</p>
Lighting Division/ HyD and Survey Division/ HyD Kwan Yuen TONG	Trial of CSWD	When the sample program CSWD_DWGCONTROL.BAS run on Microstation, execution error was found, so we were unable to carry out a trial on CSWD	See previous response to data exchange problems.
HyD / HK Region (K W Fung)		After the trial of CSWD, I have not found any difficulty. Therefore, I have no comment on it.	Noted, we are pleased that you did not experience any difficulties

Dept	Consultation Document Ref.	Observation during trial	Suggested addition/revision to CSWD	Justification	Consultant's Response
HyD/ NT Region (L K Tsang)	P.7 - Porject#1 etc	Maintenance works are usually without a project reference. In this case, we use the drawing number as the project reference in the trial. Is this acceptable to CSWD?	CSWD should recommend a file structure for drawings without a project reference.	Hundreds of CAD drawings has to be produced each year for maintenance works which do not have a project reference. The storage of CAD files for this type of drawings should be properly structured.	In the absence of a project reference users could use the project name or an abbreviation of the project name to define the top-level directory. HyD may categorise maintenance records based on geographic region, in which case you could use an abbreviation for the various regions i.e. NTW New Territories West NTE New Territories East KLN KowloonHKI Hong Kong Island
HyD/ NT Region (L K Tsang)	P.7 - Porject#1\ADMIN	To store drawing frames in the Admin sub-folder may not be the most efficient. Additional operations will be required to scale and move the reference file as well as to make reference to it. Our current practice is to store the drawing frames in the form of cells	1. To create a Symbols sub-folder under the Project directory to accommodate cell libraries for particular projects. 2. To consider the drawing frames as files of current drawings and store in Drawing sub-folder	Operations will be more efficient.	The CSWD folder structure can be furnished with additional sub folders at the users discretion. Where ever possible Project specific drawing symbols should be avoided as this leads to a duplication of standards. One of the aims of the CSWD is to create a series of standards, which can be used by everyone and applied to all types of work. Storing drawing frames as cells is a very simplistic approach and a big mistake. Drawing frames often contain company logos, addresses, and project names etc, which often have a habit of changing. A good example being the recent changes to the MTRC, KCRC

Dept	Consultation Document Ref.	Observation during trial	Suggested addition/revision to CSWD	Justification	Consultant's Response
					and Airport Authority Logo's. By storing the drawing frame in a reference file you have one unique source for this data so when anything needs to be revised it is revised once and is automatically updated on all drawings. Your argument about additional operations required to scale, move and make reference to reference files applies equally to cells. If your drawing frame is in the form of a cell you will need to open the cell library, select the cell and place the cell at the correct scale.
HyD/ NT Region (L K Tsang)	P.8 - Status	We cannot find a completely relevant character code for maintenance works	To add a character code " M = maintenance work"	The model files for maintenance works can be instantly recognisable from its file name.	Very good idea – M for maintenance work will be added to the CSWD
HyD/ NT Region (L K Tsang)	P.8 - Status	When we prepared a general layout plan for a proposed road, we found that it is time-consuming to split a reference model file containing the basic survey into 2 files with character codes E and R. Moreover, further editing work will be required if the geometry of proposed road revised.	Consider to provide a character code for model files containing existing features, say F.	It is not worth at the design stage to divide the existing feature into " existing to remain" and " remove" for a road works project since the design may be revised several times before it is finalised. Omitting this process will reduce much abortive work	Status code W should be used in this case. 1. The CSWD is applicable to all drawings except presentation drawings. Although it should be noted that situations always arise where users need to produce one off special drawings that need not apply to any standards so we need a degree of flexibility in the application of the CSWD. 2. As mentioned above one of the primary aims of the CSWD is to create a set of standards that includes symbols and resources,

Dept	Consultation Document Ref.	Observation during trial	Suggested addition/revision to CSWD	Justification	Consultant's Response
					which can be applied to all projects. The creation of project specific standards leads to duplication and confusion. For example currently in Hong Kong MTRC, KCRC and soon Works Departments all have their own CAD Standards just imagine how much easier and more efficient it would be if all three used the CSWD.

Comments on the Proposed Standards

Item	Lighting Div's Comment	Survey Div 's Comment	Response
Folders	No comment	No comment	Noted
File Settings	No comment	No comment	Noted
File Naming	The proposed file naming convention for model file is unable to uniquely identify the model without specifying the full path of the file name (i.e. to indicate the project name). It is suggested to add the project name to the file name.	Noted – the project ID will be added into the model file reference	
Layer Naming	No comment	No comment	Noted
Layer Assignment	No comment	The Standard Interface program should be able to help minimize the efforts and expedite the operations in assigning Level Name	Agreed – this should be one of the primary functions of the SI.
Drawing Setting	No comment	No comment	Noted
Plot Settings	No comment	No comment	Noted
Application #1	No comment	No comment	Noted

Item	Lighting Div's Comment	Survey Div 's Comment	Response
Application #2	No comment	No comment	Noted
System Requirements	No comment	For running on WIN 2000, the recommended minimum hardware requirements are PIII CPU, 256 MB RAM, 40 GB HDD, 1024*768 display resolution	Noted
HyD/ NT Region (L K Tsang)	The CSWD should clearly state which types of drawings it is applicable		The CSWD is applicable to all drawings except presentation drawings. Although it should be noted that situations always arise where users need to produce one off special drawings that need not apply to any standards so we need a degree of flexibility in the application of the CSWD.
HyD/ NT Region (L K Tsang)	Referring to proposed standard folder structure as shown on page 7, Symbols and Resources sub-folders should also be created under the Project folder to store the symbols libraries and resource files required by that particular project. This will ensure each project can be self-supply of necessary resource files and symbol libraries. It is very significant when someday some of such files become obsolete and discarded from the CSWD. In addition, it will benefit the data exchange with some local or overseas non-CSWD users.		One of the primary aims of the CSWD is to create a set of standards that includes symbols and resources, which can be applied to all projects. The creation of project specific standards leads to duplication and confusion. For example currently in Hong Kong MTRC, KCRC and soon Works Departments all have their own CAD Standards just imagine how much easier and more efficient it would be if all three used the CSWD.

Dept	Reference	Department' s Comment	Consultant's Response
Lighting Division/ HyD and Survey Division/ HyD	Implementation and Administration	The issues regarding the required additional staff resource, training and cost for implementation should be addressed.	These issues have been addressed in Working Paper 3
Kwan Yuen TONG	Element coding	<p>The “ 1:200 and 1:500 Survey and Drafting Specifications” has long been adopted by the survey sections in the Works Bureau for engineering survey drawing. Thus this specification should be followed when designing the standard symbols for Class 800 –809 Ground Survey.</p> <p>It is suggested that the proposed Element Coding Class 808 Military Cable should be deleted from the group Ground Survey.</p>	<p>For your information, the symbols have been passed to the Consultant as</p> <p>Part of HyD's comment on Working Paper No. 3D. The Consultant has agreed to</p> <p>Review the drawing symbols and include those which are appropriate.</p> <p>(b) The class for Military Cables is added as requested by Kowloon Regional</p> <p>Office (you may wish to see discussions in the summary of comments on WP 3A for</p> <p>The rationale behind).</p>

APPENDIX I

RESPONSES TO COMMENTS ON THE DRAFT CONSULTATION REPORT

APPENDIX I – RESPONSES TO COMMENTS ON THE DRAFT CONSULTATION REPORT

Dept	Para. No.	Department' s Comment	Consultant's Response
ArchSD		We have no further comments to the Consultation Report.	Noted.
CED		We have no comments on the report.	Noted
DSD		No comments on the Consultation Report	Noted
EMSD		No comments	Noted
HyD		The Report is well presented. No comments	Thank you and noted
ITSD	Section 5.1.9	With reference to the terms of reference of the CSWD Committee presented in WP4, it appears not necessary to involve the 2 CAD software vendors as regular members of the CSWD committee. Please consider if invitation of them to join CSWD committee or working group meetings in an as needed basis is sufficient to meet the purpose of putting pressure on them to resolve problems on CAD data exchange or improve CAD software.	We would certainly not suggest that CAD Vendors should be permanent members of the committee and have only suggested that they are 'involved'. An 'as-needed' basis should be sufficient. Clause 5.1.9 will be amended accordingly.
ITSD	Section 5.2.1	The table on recommendation did not address the solution option mentioned in Section 4.3.11 for resolving the problem that the Chinese font being used by TD for traffic aid marking is not part of CSWD.	Table 5.2.1 recommends the changes to be made to the Preliminary CSWD as a result of the consultation exercise. In order to resolve which option should be adopted with regard to the Chinese font being used by TD for their Traffic Aids Drawings, an action is included in Clause 5.3.2 to clarify the licensing arrangements for the font set.
ITSD	Section 5.3.6	With reference to Section 3.2.4 and Section 5.1.4, about half of CAD users from participating departments considered that they would have some difficulty to familiarize with the CSWD. Is it advisable to organize formal training to these CAD users prior to roll out of the CSWD? If yes, please consider including the lead time for arrangement and conduction of such training in the CSWD implementation plan.	The results of the CSWD trial were very positive and demonstrated that once users started using the CSWD in earnest they made very good use of it. Nonetheless, training is always useful and will be included in Working Paper #5.
TDD		No comments	Noted
TD		No comments received.	
WSD		No comments on the Consultation Report	Noted