# PARTICULAR SPECIFICATION PS.G01

## Approved Shop Drawings, As-built Drawings, Operational and Maintenance Manuals and Records

# Particular Specification for Approved Shop Drawings, As-built Drawings, Operational and Maintenance Manuals and Records

## Part I – Application of AutoCAD 2008 in Preparation of Drawings

**The Architectural Services Department (ArchSD) will commence to use AutoCAD version 2008 starting from 1 February 2008.**

(a) ArchSD will accept CAD drawing files of **AutoCAD Version 2008 to 2000** from contractors starting from 1 February 2008. Contractors are free either to opt upgrading their AutoCAD version or NOT upgrading.

(b) If the Contractor is not willing to upgrade their AutoCAD version, he can use the free tool provided by Autodesk to downgrade AutoCAD 2008 drawings issued by ArchSD to match his AutoCAD version currently used. He could still produce his CAD drawings in older versions but would not benefit from the new productivity features of new 2008 version.

(c) The free tool provided by Autodesk is "DWG TrueView" (previous version known as TrueConvert) which could be downloaded from :

**http://usa.autodesk.com/adsk/servlet/index?siteID=123112&id=2952277&linkID=9240618**

(d) The Autodesk "DWG TrueView" could convert **AutoCAD Version 2008** files to **Version 2007/2004/2000** files in one batch action**.**

(e) For example, if the Contractor has AutoCAD Version 2004 software for production, he could convert ArchSD's AutoCAD **Version 2008** drawing files to **Version 2004** drawing files for editing/processing and then submitting the **Version 2004** drawing files to ArchSD.

(f) To avoid incompatibility with lower version of AutoCAD, most of the new drafting features in **AutoCAD Version 2008** will not be used in ArchSD's CAD drafting practice.

(g) In case some new drafting features used in **AutoCAD Version 2008** DWG files are incompatible with lower version of AutoCAD, guidance notes will be attached to drawing files to be issued to contractors.

**Part II – Proforma Structure and Contents of Operation and Maintenance Manuals**

**Option A – Structure and Contents grouped by Types of Installations/ Services/ Equipment of Each Contract**

**Contents of Operation and Maintenance Manuals**

Provide separate volume of Operation and Maintenance (O&M) Manuals for each installations/services/equipment :-

**1. Project Information**

The project information shall include the following:-
(a) Project title and site address
(b) Contract no., contract title, contractor/sub-contractor name, contact persons and telephones/faxes; and
(c) Key contract dates - contract commencement, substantial completion, length of maintenance period.

**2. System Description**

Provide detailed description of the system/services/equipment installed, including the following :-

(a) Type(s) of system(s) and equipment installed;
(b) Locations of the system and major equipment, and what and where they serve;
(c) Description of operation and functions of the system and equipment;
(d) Design criteria, design data and parameters; and
(e) General operating conditions, expected performance, energy and resources consumption where applicable.

**3. Equipment Schedule**

Provide a schedule of all items of equipment and plant stating the location, name, model no., manufacturer's serial or reference numbers, duties and performance data.

**4. Spare Parts Lists**

This shall include recommendations from manufacturers/suppliers for spare parts with item description, quantity, unit rates and agents and stocking levels for the equipment and plant of the system.

**5. Manufacturers' Certificates/Guarantees/Warranties and Statutory Inspection Certificate**

This shall include manufacturers' certificates such as factory test certificate, laboratory test reports, guarantees and warranties etc and any others statutory inspection certificates where required. Whilst photocopies may be allowed in the draft version, originals should be included in the final version of the manuals.

## 6. Safety Precautions for Operation and Maintenance

Describe in this section the hazards and safety precautions of which the operation and maintenance staff need to be aware. These shall include the following :-

(a) Any known feature or operational characteristics of the equipment or systems installed which may produce a hazard;
(b) Any known hazards against which protection can be provided;
(c) Any mandatory requirements relating to safety;
(d) Any other safety precautions which should be observed; and
(e) Any other relevant warnings.

## 7. Operation Instructions

Provide instructions for the safe and efficient operation, under both normal and emergency conditions, of the system installed. These will be in addition to the manufacturers' literature for equipment and plant items and will include the following :-

(a) An outline of the general operating mode;
(b) Control data (location, effect, object, sequence, limits of capability, modes, set points);
(c) Procedures and sequences for start-up, running and shut-down, under both normal and emergency conditions;
(d) Interlocks between equipment items;
(e) Operating procedures for stand-by equipment;
(f) Precautions necessary to overcome known hazards;
(g) The means by which any potentially hazardous equipment may be made safe;
(h) Target figures for both energy consumption and energy costs; and
(i) Forms for recording plant running hours, energy consumption and energy costs.

## 8. Maintenance

(a) Maintenance Instructions

Provide the manufacturers' and the contractor/subcontractor's recommendations and instructions for maintenance for each item of plant and equipment installed. Clear distinction must be made between planned tasks (preventive maintenance) and work done on a corrective basis (corrective maintenance). Instructions shall be given on each of the following, as appropriate:-

(i) Isolation and return to service of plant and equipment;
(ii) Adjustments, calibration and testing;
(iii) Dismantling and reassembly;
(iv) Exchange of components and assemblies;
(v) Dealing with hazards which may arise during maintenance;
(vi) Nature of deterioration, and the defects to be looked for; and
(vii) Special tools, test equipment and ancillary services.

**8. Maintenance (Cont'd)**

(b) Maintenance Schedules

Propose maintenance schedules for all the preventive maintenance tasks identified above. The schedules shall be based on both manufacturers' recommendations and other authoritative sources (e.g. statutory or mandatory requirements) and will include the following :-

(i) Routine servicing;
(ii) Inspections;
(iii) Examinations;
(iv) Tests;
(v) Adjustments;
(vi) Calibration;
(vii) Lubrication; and
(viii) Overhaul.

The frequency of each task may be expressed as specific time intervals, running hours or completed operations, as appropriate. Collectively, the schedules will form a complete maintenance cycle, repeated throughout the working life of the installation.

**9. Record Drawings**

(a) Provide a complete list of manufacturer shop drawings with drawing number/reference.

(b) Provide a complete list of as-built drawings with drawing number/reference and brief description for computer diskettes.

**10. Technical Literature**

(a) A complete set of all manufacturers' literature shall be provided for the plant and equipment installed, and assembled for the system. The literature shall apply only to specific items actually supplied for the contract.

(b) The literature should provide the following information where applicable :-

(i) Description of the product as purchased with highlighted model numbers;
(ii) Performance - behavioural characteristics of the equipment in use;
(iii) Applications - suitability for use;
(iv) Factory test reports, detailed drawings, circuit diagrams;
(v) Operation and maintenance instructions details;
(vi) Resources of plant, material and space required;
(vii) Methods of operation and control;
(viii) Cleaning and maintenance requirements;
(ix) Spare parts lists ;
(x) Protective measures and safety precautions; and
(xi) Public safety considerations.

## Part III – Requirements of Approved Shop Drawings, As-Built Drawings and Documents for Architectural Works

| Items of Work | Reference | Document/Information |
|---|---|---|
| Plumbing Layouts and Vertical Plumbing Diagram | GS 19.25<br>PS.G01<br>SCC 14 | Final version of as-built drawings |
| Drainage Layouts and Sanitary Plumbing Diagram, Sanitary Fitting Schedule and Manhole Schedule | GS 19.73 and 23.58<br>PS.G01<br>SCC 14 | Final version of as-built drawings |
| Metal/Aluminium windows, glazed doors, weatherproof louvers, and louvers | GS 17.34 and 17.38<br>PS.G01<br>PS.A01<br>SCC 14 | Final version of approved schedule and shop drawings and operation & maintenance manual |
| Ironmongery Schedule | GS 14.09<br>PS.G01<br>SCC 14 | Final version of approved schedule and operation & maintenance manual |
| Timber doors and steel doors | GS 13.60 and 17.32<br>PS.G01<br>PS.A01<br>SCC 14 | Final version of approved schedule and shop drawings and operation & maintenance manual |
| Proprietary roofing system | GS 12.118 and 12.119<br>PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawing, operation & maintenance manual and warranty and a list of approved material used. |
| Proprietary waterproofing system | GS 12.118 and 12.119<br>PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawing, operation & maintenance manual and a list of approved material used. |
| Suspended Ceiling System | GS 13.23<br>PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawing and maintenance manual |
| Roller Shutters (including fire shutters) | GS 17.41 and 17.44<br>PS.G01<br>SCC 14 | Final version of approved shop drawing and operation & maintenance manual |
| Proprietary System Installation | PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawing, operation & maintenance manual and as built drawings |

**Part III – Requirements of Approved Shop Drawings, As-Built Drawings and Documents for Architectural Works (Cont'd)**

| Items of Work | Reference | Document/Information |
|---|---|---|
| Final site surveying/levelling | GS 2.26<br>PS.G01<br>SCC 14 | Refer to Part VII for requirements |
| Carpentry, Fittings and Furniture | GS 13.01 and 14.100<br>PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and maintenance manual |
| Toilet & Shower Cubicle System, compact laminate panelling/ ducting system | GS 22.77<br>PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and maintenance manual |
| Folding/Moving Partition System | GS 22.02 and 22.81<br>PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings, and operation & maintenance manual |
| Proprietary Flag Pole | PS.G01<br>PS.A01<br>SCC14 | Final version of approved shop drawings, and operation & maintenance manual |
| Recycled plastic wood railing | PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and maintenance manual |
| Glass canopy and skylights, integrated with photovoltaic panels, metal cladding, aluminium architectural feature and A/C screen | GS 16.69<br>PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings, operation & maintenance manual and as-built drawings |

**Part III – Requirements of Approved Shop Drawings, As-Built Drawings and Documents for Architectural Works (Cont'd)**

| Items of Work | Reference | Document/Information |
|---|---|---|
| Metal gates | PS.G01<br>SCC 14 | Final version of approved shop drawings and operation and maintenance manual |
| Fall Arrest Systems | PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and operation & maintenance manual |
| Paving material | PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and operation & maintenance manual |
| Solid surfacing material | PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and operation & maintenance manual |
| Timber sports flooring | PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and operation & maintenance manual |
| Fabric faced acoustic panel | PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and operation & maintenance manual |
| Timber acoustic panel | PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and operation & maintenance manual |
| Access panel | PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and operation & maintenance manual |
| Tiling | PS.G01<br>PS.A01<br>SCC 14 | Final version of approved shop drawings and operation & maintenance manual |

## Part III A – Requirements of Media for Approved Shop Drawings, As-Built Drawings and Documents for Architectural Works

### A. Project Information

Record number provided by the Architect and the certified date of Completion of Works shall be inserted in each drawing as stated in Section B, C & D below to compile the standard form ADRU-SD of Part IIIC in accordance with the Guidelines for Preparation of As-built Drawing Files saved in CD/DVD-ROM computer disk for Architectural Works (ADRU-G3e of Part IIIB).

### B. Approved Shop Drawings & As-built Drawings in 'AutoCAD' Format

Contractors shall produce all drawings in AutoCAD Version 2008 to 2000 and to the satisfaction of the Architect. CAD drawings shall be prepared conforming with the CAD Standard for Works Projects (CSWP) as posted on the Development Bureau's web site http://www.devb.gov.hk/cswp and in accordance with the latest version of CAD Manual for ArchSD Projects issued by this Department. Should any technical conflict between the CSWP and CAD Manual arise, the CSWP will take precedence.

### C. Approved Shop Drawings & As-built Drawings in 'PDF' Format

These drawings shall be converted to image files in Adobe Portable Document Format (PDF) v1.2, 1.3, 1.4, 1.5 or 1.6 (compatible to Acrobat Version 3, 4, 5, 6 or 7). The PDF image file shall be printed out from drawing file by AutoCAD in full size with minimum resolution 600x600 dpi. The line weight and colour setting of PDF image file shall be matched with hardcopy output.

### D. Approved Fire Services Installations drawings, Approved General Building Plans & relevant documents in 'TIFF' or 'JPEG' Format

These drawings & relevant documents shall be converted to image files in Tag Image File Format (TIFF) or Joint Photographic Experts Group (JPEG). The TIFF image file shall be reproduced from the full size drawings with minimum resolution of 400x400 dpi in compression G4 format. The JPEG image file shall be reproduced from full size drawings with minimum resolution of 400x400dpi.

### E. CD/DVD-ROM computer disk

These drawings files shall be in three sets of CD/DVD-ROM computer disk. Each CD/DVD-ROM computer disk shall be labelled in accordance with Guidelines for Preparation of As-built Drawing Files saved in CD/DVD-ROM computer disk for Architectural Works as stated in standard form ADRU-G3e of Part IIIB issued by this Department and supplied in sturdy plastic containers.

**Part IIIB (Form ADRU-G3e) – Guidelines for Preparation of As-Built Drawing Files to be Saved in CD/DVD-ROM Computer Disk for Architectural Works**

## 1. Procedure for producing of CD/DVD-ROM computer disk

1.1 After the allocation of record number by ArchSD, a "Block" containing the record number provided by the Architect and the certified date of completion of the Works must be inserted on the right bottom corner of each drawing before converting to PDF/TIFF/JPEG format. Sample as figure 1.

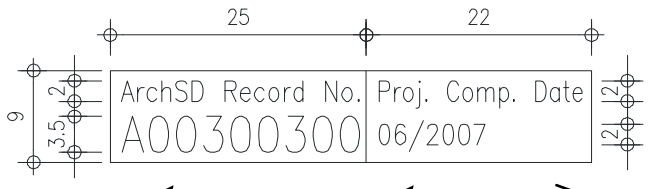
1.2 The "Block" as stated in item 1.1 must be inserted for other Raster Images (TIFF/JPEG format).

1.3 If the file is a model file (X-ref) to the files for item 1.1 and 1.2, no "Block" insertion is required.

1.4 Separate folder for different type of files are required in computer disk. Sample as figure 2.

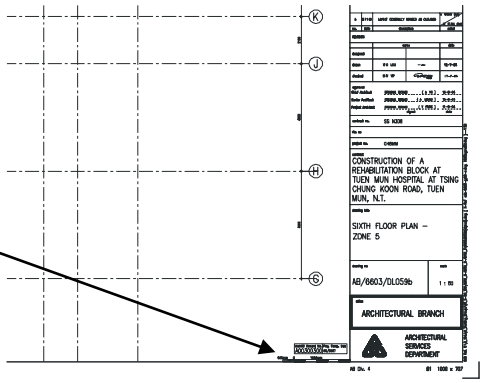
1.5 After the insertion of "Block", all the files are required to save into a CD/DVD-ROM computer disk which including all AutoCAD DWG/Raster Image format files, corresponding PDF format files and updated list of record drawings in excel format. Project information shall be labelled on CD/DVD-ROM computer disk. Sample as figure 3.

**Figure 1: Format of "Block"**




**Record No**.
(Attribute with Tag Name ASDRECNO)

**Project Completion Date**.
(Attribute with Tag Name ASDRECDATE)




"Block" shall be located on the right bottom corner vacant space

**Setting of "Block" for record number in AutoCAD (DWG format)**

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|---|---|
| Block Name | ArchSD_RN |
| Attribute Tag Name of Record No. | ASDRECNO |
| Attribute Tag Name of Date. | ASDRECDATE |
| Layer Name | ADA010__ |
| Text Style Name | Standard |
| Text Font Name | Romans |
| Color (Lineweight) of Record No. text. | Red (0.35mm) |
| Color (Lineweight) of other text and Line. | Cyan (0.25mm) |

**Figure 2: Proposed folder structure**

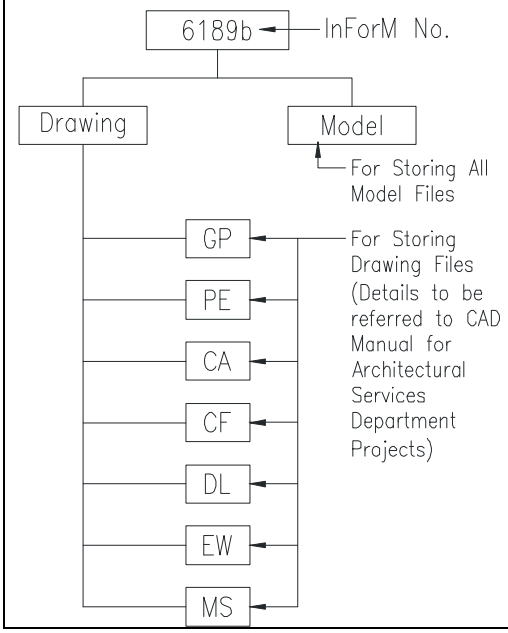


**Figure 3: Label format of CD/DVD-ROM**

**Part IIIC (Form ADRU-SD) – List of Approved Shop Drawing & As-Built Drawings Record Files**

**Form ADRU-SD**

**Project Title** (English) PROJECT TITLE IN ENGLISH
(Chinese) 工程項目名稱

**Street / Place** (English) PROJECT LOCATION IN ENGLISH
(Chinese) 工程項目位置

**Project No.** ..... **InForM No.** ..... **Proj. Comp. Date** .....
**Contract No.** ..... **W.O. No.** .....

Book ..... Page .....
CD_Rom No. .....
Location Code .....
Office Use Only
(APB/Arch Dwg Records)

| Record No | Drawing No. rev | Drawing Title | Digital File* | Record Type |
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* dwg file unless otherwise stated

Prepared By ..... ..... .....
STO(A)16 Name in Blocks (Initial) (Date)

Checked By ..... ..... .....
PTO(A)12 Name in Blocks (Initial) (Date)

ADRU-SD (7/08)

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TO(A)/Grade
Arch Branch

**Part IIID (Form ADRU-FS) – List of Approved FS Installation / DG Store Drawing Record Files**

**Project Title** (English) PROJECT TITLE IN ENGLISH
(Chinese) 工程項目名稱

**Street / Place** (English) PROJECT LOCATION IN ENGLISH
(Chinese) 工程項目位置

**Project No.** ..... **InForM No.** ..... **Proj. Comp. Date** .....
**Contract No.** ..... **W.O. No.** .....

**Form ADRU-FS**
Book ..... Page .....
CD_Rom No. .....
Location Code .....
Office Use Only
(APB/Arch Dwg Records)

| Record No | Drawing No. rev | Drawing Title | Digital File* |
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* dwg file unless otherwise stated

Prepared By STO(A) ..... Name in Blocks ..... (Initial) ..... (Date)
Checked By PTO(A) ..... Name in Blocks ..... (Initial) ..... (Date)

Page 1 of 1

ADRU-FS (7/08)

TO(A)/Grade
Arch Branch

## Part IIIE (Form ADRU-AD) – List of Architectural Drawing Record Files

**Form ADRU-AD**

**Project Title** (English) PROJECT TITLE IN ENGLISH
(Chinese) 工程項目名稱

**Street / Place** (English) PROJECT LOCATION IN ENGLISH
(Chinese) 工程項目位置

**Project No.** _____ **InForM No.** _____ **Proj. Comp. Date** _____
**Contract No.** _____ **W.O. No.** _____

Book _____ Page _____
CD_Rom No. _____
Location Code _____
Office Use Only
(APB/Arch Dwg Records)

| Record No | Drawing No. rev | Drawing Title | Digital File* | Record Type |
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Prepared By _____ _____ _____
STO(A) Name in Blocks (Initial) (Date)

Checked By _____ _____ _____
PTO(A) Name in Blocks (Initial) (Date)

ADRU-AD (7/08)

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TO(A)/Grade
Arch Branch

**Part IIIF (Form ADRU-SC) – List of Approved SCCU Submission Drawings & Approval Letters Record Files**

**Form ADRU-SC**

**Project Title** (English) PROJECT TITLE IN ENGLISH
(Chinese) 工程項目名稱

**Street / Place** (English) PROJECT LOCATION IN ENGLISH
(Chinese) 工程項目位置

**Project No.** _____ **InForM No.** _____ **Proj. Comp. Date** _____
**Contract No.** _____ **W.O. No.** _____

**Book** _____ **Page** _____
**CD_Rom No.** _____
**Location Code**
**Office Use Only**
**(APB/Arch Dwg Records)**

| Record No | Drawing No. rev | Drawing Title | Digital File* |
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Prepared By STO(A) _____ Name in Blocks _____ (Initial) _____ (Date)

Checked By PTO(A) _____ Name in Blocks _____ (Initial) _____ (Date)

Page 1 of 1

ADRU-SC (7/08)

TO(A)/Grade
Arch Branch

**Part IV – Requirements of Approved Design Drawings, Shop Drawings, As-Built Drawings and Records, Design Calculation and Documents for Structural Works in Works Contract other than Design and Build Contracts**

| Item of Work | Document/Information |
|---|---|
| Temporary Works | As-built records showing the layout and construction details of those parts of the temporary works that remain in position after the contract. |
| Steel Sheet Piling | If sheet piles are to remain in position after use |
| Footing | As-built footing plans |
| Structural Steel Works designed by the SO | Approved design drawings, and checking calculation of alternative design, if any, proposed by the contractor; and<br>As-built drawings. |
| Structural Steel Works designed by the contractor | Approved design drawings, and design calculation;<br>As-built drawings; and<br>Maintenance Manual.<br>Final version of approved shop drawing (i.e. connection details) |
| Hoisting Crane/lifting eye | Final version of approved shop drawing |
| Site Formation / Geotechnical Works | As-built topographical survey, site formation layout, details drawings, design calculation and maintenance manual covering the following -<br>(i) The extent of man-made slopes and retaining walls, if any (including cut and fill slopes). The legend for cut slopes should be different from that of the fill slopes;<br>(ii) The contour lines shall terminate at the boundaries of the cut/fill slopes and there shall not be any contour lines within the cut/fill slopes;<br>(iii) Any surface protection such as hydro-seeding, sprayed concrete, chunam, etc. and surface drainage system shall be marked clearly on the as-built drawings;<br>(iv) Any installation such as soil nails, dowel bars, horizontal drains, etc. shall also be marked on the as-built drawings. The respective grouting and testing records shall also be submitted. The elevation of the respective slopes shall be shown;<br>(v) Any retaining walls layout and details; and<br>(vi) Any other geotechnical features. |
| Other Specialist Works or other items | To be determined by the project structural engineer. |

**Part IVA (Not Used)**

**Part IVB – Requirements of Media for Approved Design Drawings, Shop Drawings, As-Built Drawings and Records, Design Calculation and Documents for Structural Works**

**A. Project Information**

Record number provided by the SO as stated in the standard form (SEB/DWG.004 of Part IVC) shall be inserted in each drawing in accordance with the "Guidelines for Preparation of As-built Drawing Files saved in CD/DVD-ROM computer disk for Structural Works" (SEB/DWG.005 of Part IVD).

**B. Approved Design Drawings, Shop Drawings and As-built Drawings and Records in TIFF Format**

All approved design drawings, shop drawings and as-built drawings and records shall be converted from the full size drawing to images files in TIFF format with minimum resolution of 400 x 400 dpi in compression G4 format.

**C. Design Calculation in PDF Format**

All Design Calculation of as-built structural works shall be converted to files in Adobe Portable Document Format (PDF) v1.2, 1.3, 1.4, 1.5 or 1.6 (compatible to Acrobat Version 3, 4, 5, 6 or 7) with Optical Character Recognition (OCR). The PDF file shall be printed out from design calculation of as-built structural works in full size with minimum resolution 300x300 dpi.

**D. Hard Copy**

All approved shop drawings, as-built drawings, design calculation and documents shall be in one set of hard copy.

**E. CD/DVD-ROM computer disk**

All files of approved design drawings, shop drawings, and as-built drawings and records shall be in one set of CD/DVD-ROM computer disks. Each CD/DVD-ROM computer disk shall be labeled in accordance with "Guidelines for Preparation of As-built Drawing Files saved in CD/DVD-ROM computer disk for Structural Works" (form SEB/DWG.005 of Part IVD) and be supplied in sturdy plastic containers.

All files of design calculation shall be in one set of CD/DVD-ROM computer disks. Each CD/DVD-ROM computer disk shall be labeled in accordance with "Guidelines for Preparation of Design Calculation Files of As-built Structural Works saved in CD/DVD-ROM computer disk for Structural Works" (form SEB/DWG.006 of Part IVE) and be supplied in sturdy plastic containers.

**Part IVC (Form No. SEB/DWG.004) – Record Numbers for As-Built Drawings**

*LOCATION CODE:* _____ *Page:* _____

*LOCATION:* _____

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| Record No. | Drawing No. | Description |
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**Part IVD (Form No. SEB/DWG.005) – Guidelines for Preparation of As-Built Drawing Files to be Saved in CD/DVD-ROM Computer Disk for Structural Works**

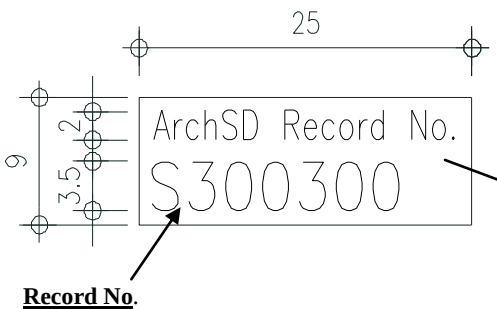
## 1. Procedure for producing of CD/DVD-ROM computer disk

1.1 After the allocation of record number by the Architect, a "Block" containing the record number and project completion date must be inserted on the lower right bottom corner of each drawing file before converting to Tiff format. Sample as figure 1.

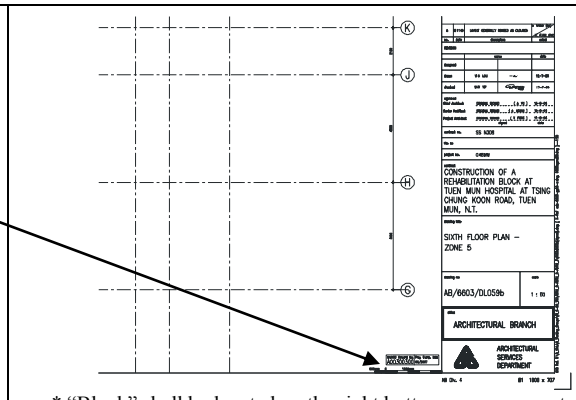
1.2 Separate folder for different type of files are required in computer disk. Sample as figure 2.

1.3 After the insertion of "Block", all the files are required to save into a CD/DVD-ROM computer disk which including all Tiff format files and updated list of record drawings in excel format. Project information shall be labelled on CD/DVD-ROM computer disk. Sample as figure 3.

**Figure 1: Format of "Block"**




**Record No**.
(Attribute with Tag Name ASDRECNO)

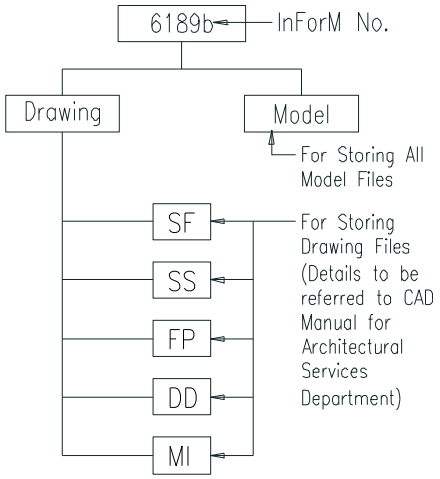



* "Block" shall be located on the right bottom corner vacant space

**Setting of"Block" for record number in AutoCAD (DWG format)**

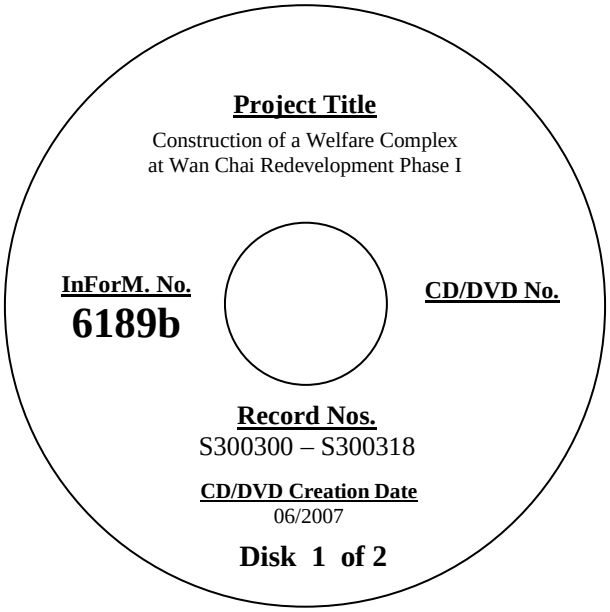
| | |
|---|---|
| Block Name | ArchSD_SMN |
| Attribute Tag Name of Record No. | ASDRECNO |
| Layer Name | ADS010__ |
| Text Style Name | Standard |
| Text Font Name | Romans |
| Color (Lineweight) of Record No. text. | Red (0.35mm) |
| Color (Lineweight) of other text and Line. | Cyan (0.25mm) |

**Figure 2: Proposed folder structure**




SF : Site formation
SS : Piling record / substructure
FP : Framing plan
DD : Detail drawing
MI : Miscellaneous

**Figure 3: Label format of CD/DVD-ROM**



**Part IVE (Form No. SEB/DWG.006) – Guidelines for Preparation of Design Calculation Files of As-Built Structural Works to be Saved in CD/DVD-ROM Computer Disk for Structural Works**

**1. Guidelines for producing of CD/DVD-ROM computer disk**

The structural design calculations files shall be prepared and organized as follows:

1.1 There shall be a master file, containing indices with hyperlinks pointing to individual calculation files, each containing calculations of similar natures. Appropriate folder structures incorporating multiple levels of sub-folders should be adopted for projects with multiple building blocks or sizeable structures.

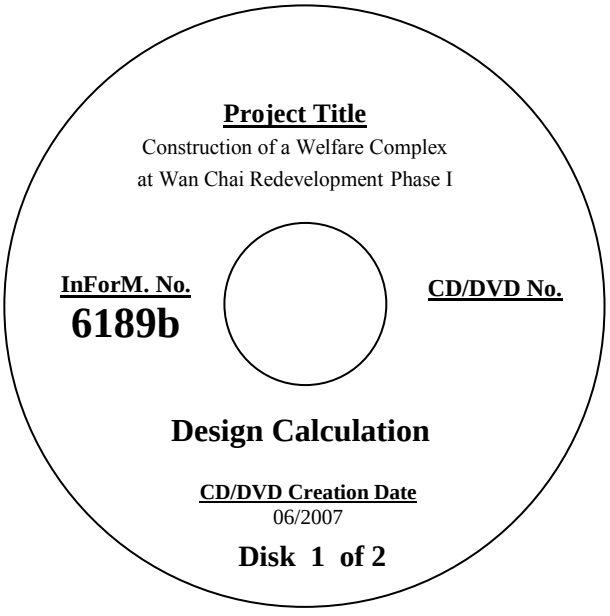
1.2 The calculation files shall be grouped under folders/sub-folders according to their natures, e.g.

(i) Piling;
(ii) Wind analysis;
(iii) Sub-structure;
(iv) Super-structure;
(v) Detailed design of horizontal structural elements, (calculations of structural elements shall be presented in ascending order of floors levels and element numbers); and
(vi) Detailed design of vertical structural elements and etc.

1.3 In general, each calculation file shall contain not more than 200 pages of calculations, otherwise the file shall be separated into sub-files.

1.4 Project information shall be labelled on CD/DVD-ROM computer disk. Sample as figure 1.

**Figure 1: Label format of CD/DVD-ROM**



**Part V – Requirements of Approved Shop Drawings, As-Built Drawings and Documents for Building Services / E&M Installations**

**1. As-Built Drawings**

The as-built drawings required to be provided by the Contractor for various types of BS/E&M installations shall include, but not limited to the followings :-

(a) Building services layout plans such as ducting arrangement, trunking arrangement, piping arrangement, etc;
(b) System schematic diagrams, control diagrams and wiring diagrams;
(c) Concealed work layout plan such as concealed conduit routing, etc; and
(d) Installation details and assembly drawings such as LV cubicle switchboard layout, motor control cubicle layout, etc.

**2 Operation and Maintenance Manuals**

(a) Hard and Soft Copy

(i) The final approved Operation and Maintenance (O&M) Manuals in both hard and soft copies shall be provided by the Contractor. 4 sets of hardcopies are required for A/C and electrical installations, and 3 sets for other installations, of which 1 set of the hardcopy shall be the original.

(ii) A softcopy of the complete set of O&M Manuals shall also be provided by the Contractor. The electronic files shall be in Adobe Acrobat format. Separate electronic file shall be provided for each volume of the O&M manuals as described in item (b) below.

(b) Binding of O&M Manuals

O&M Manuals for different installations shall be bounded into separate volumes as follows:

(i) Air-conditioning installations including chillers, refrigeration plants, air handling units and all peripheral units;
(ii) Mechanical ventilation installations including all ventilation system and hydro-vent system (if any);
(iii) Electrical installations including main distribution, sub-main distribution and final sub-circuit installations;
(iv) LV switchboard installations;
(v) Emergency generator installations;
(vi) Fire service installations including sprinkler, hose reel/fire hydrant, fire detection and alarm, total flooding fire extinguishing installations and portable fire fighting equipment;
(vii) Lifts and escalators;
(viii) Catering Equipment;
(ix) Medical Gases Installations;
(x) Broadcast Reception Installations;
(xi) Security Installation;
(xii) Plumbing and Drainage Installations; and
(xiii) Others such as low voltage electrical installation, electrical operated roller shutters, lifting devices/appliances, etc.

(c) Structure and Contents

Each O&M manual shall include the following information under separate sections as appropriate:

(i) Project Information

The following information shall be included :-
Project title, site address, contract no., contract title, contractor/sub-contractor name, address, contact persons and their telephone/fax nos., contract commencement date, substantial completion date and end date of maintenance period.

(ii) System Description

- Type(s) of system(s) and equipment installed;
- Design criteria, design data and parameters;
- Locations of the system and major equipment, and what they serve;
- Description of operation and functions of the system and equipment; and
- General operating conditions, expected performance and energy and resources consumption where applicable.

(iii) List of Installed Equipment

Schedule of all items of equipment and plant stating the location, name, model no., manufacturer's serial or reference no., manufacturer's design duties and data.

(iv) Spare Parts Lists

- Spare Parts supplied by Contractors
  Item descriptions, supplied quantities, model nos., manufacturer's serial or reference nos. and storage locations.
- Recommended Spare Parts List
  Manufacturers'/suppliers' recommendations for spare parts with item description, unit rate, recommended stock quantities as well as the agents for the parts.

(v) Manufacturers' Certificates/Guarantees/Warranties

- Manufacturers' certificates such as factory test certificate, laboratory test reports, guarantees and warranties and any others where required for the equipment and plants etc.
- Originals of Statutory Inspection Certificate for various installations, including the following :-
  - Electrical installations (Work Completion Certificate - Form WR1);
  - Fire service installations (Fire Service Certificate - Form FS172);
  - Lifts and escalators (Certificate on Examination of Lift or Escalator and signed forms/certificates as required by the Lifts and Escalators [Safety] Ordinance); and
  - Others equipment such as surveyor's test certificates for high pressure vessel, surveyor's load certificates for electrical operated roller shutters, lifting devices/appliances, etc.

    [Note: Testing records & commissioning data (other than the types prescribed above), which are required under the contract such as the T&C procedures, etc to verify the compliance of the BS/E&M system's/equipment's performance with the contract requirements, are checked and endorsed separately by the Architect and do not form part of the O&M manuals.]

(vi) Safety Precautions for Operation & Maintenance

State, where applicable, hazard warnings and safety precautions of which the operation and maintenance staff need to be aware:

- Mandatory requirements relating to safety;
- Known hazards against which protection measures shall be taken; and
- Known features or operational characteristics of the installed equipment or systems which may cause hazard and the related safety precautions.

(vii) Operation Instructions

Instructions for the safe and efficient operation, under both normal and emergency conditions, of the installed system which shall comprise the following :

- An outline of the operating mode;
- Control logic and data (sequence, effect, limits of capability, modes and set points);
- Procedures and sequences for start-up and shut-down;
- Interlocks between equipment/system;
- Calling on of stand-by equipment;
- Precautions necessary to overcome known hazards;
- Means by which any potentially hazardous equipment can be made safe;
- Estimation of energy consumption and energy costs;
- Forms for recording plant running hours, energy consumption and energy costs; and
- Operating data such as running current, operating pressure, operating flow rates, etc.

(viii) Maintenance

- Maintenance instructions

  Manufacturers' and contractor/subcontractor's recommendations and instructions for the maintenance of the installed equipment. Clear distinction must be made between planned tasks (preventive maintenance) and fault-repair tasks (corrective maintenance). Instructions shall be given on each of the following, as appropriate :

  - Nature of deterioration, and the defects to be looked for;
  - Isolation and return to service of plant and equipment;
  - Dismantling and reassembly;
  - Replacement of components and assemblies;
  - Dealing with hazards which may arise during maintenance;
  - Adjustments, calibration and testing; and
  - Special tools, test equipment and ancillary services.

- Maintenance schedules

  Proposed maintenance schedules for all the preventive maintenance tasks identified above. The schedules shall be based on both manufacturers' recommendations and other authoritative sources (e.g. statutory or mandatory requirements) and shall include the following :

  - Routine servicing;
  - Inspections;
  - Tests and examinations;
  - Adjustments;
  - Calibration; and
  - Overhaul.

  The frequency of each task may be expressed as specific time intervals, running hours or number of completed operations as appropriate. Collectively, the schedules shall form a complete maintenance cycle, repeated throughout the whole working life of the installation.

(ix) As-built Drawings

- A complete list of as-built drawings identified with drawing number/reference;
- A complete list of manufacturers' shop drawings with drawing number/reference, where applicable; and
- A brief description of CD-ROM for these drawings.

(x) Technical Literature

A complete set of manufacturers' literatures for all the plant and equipment installed in the system. The contents of these literatures shall cover the following areas where applicable:

- Description of equipment with model numbers highlighted;
- Performance - behavioural characteristics of the equipment;
- Applications - suitability for use;
- Factory/laboratory test reports, detailed drawings, circuit diagrams;
- Methods of operation and control;
- Operation instructions;
- Cleaning and maintenance requirements;
- Plants, materials and space required for maintenance;
- Protective measures and safety precautions for operation & maintenance; and
- Part lists.

(xi) Contact addresses and telephone numbers of suppliers of major equipment.

## Part VI - Requirements of Photographic / Video Records from the Contractor

### A. Photographic Records

### 1. Format and Quantity

Photographic records shall be taken in two stages as follows :-

(a) Stage I – During Construction :

(i) Monthly ground photographs taken from adjacent buildings and streets, angles subject to agreement with the Architect. Once the angles are confirmed, photographs must be taken from the same spots throughout the construction period. These photographs will be kept as records of construction, for publishing in hardcopies and digital copies, and for development of animations showing the construction of the building from ground to completion.

(ii) At the start of the contract, visit the site and submit, 4R size prints, a minimum of 36 trial shots from various locations and angles, for the Architect to select 12 angles. The angle taken must allow for the growth of the buildings and avoid changing angle at a later stage when the building rises. For buildings with substantial interiors, and as required by the Architect upon completion of the superstructure, visit the site and submit a minimum of 36 trial shots from various interior locations and angles, for the Architect to select 12 more interior angles.

(iii) Photographs must be taken at agreed fixed date of each month, e.g. each first Monday. Make monthly submissions of the following items to the Architect for the 12 selected exterior angles and 12 selected interior angles (as agreed after completion of superstructure):

- 1 set of A4 size colour print submitted in A4 folders with appropriate holders with items fully labelled.
- One CD-R containing the digital images in PC computer RGB format with each image being a minimum of 4 megapixels, in JPEG format without compression.

(b) Stage II – Upon completion of the contract and within 9 months after issue of the completion certificate :

(i) When instructed, the photographer shall visit the site to explore the best possible angles of the completed project on film, and mark-up the preferred viewing positions including external and internal features on a location plan(s) for agreement with the Architect. The photographer shall then submit 4R size colour prints with a minimum of 72 trial shots (internal and external) from various locations and angles, for the Architect to select 36 shots / angles.

(ii) The photographer shall then re-visit the project under the best weather and lighting conditions (including early morning, late afternoon or night shootings) and produce the items as stated below for the 36 selected shots / angles :

- 1 set of A4 size colour prints submitted in A4 folders with appropriate holders with items fully labelled.
- 400 mm x 500 mm direct print on crystal paper for 4 nos. of selected shots by the Architect.
- One CD-R containing a set of high resolution (300 dpi minimum 16 megapixels) digital images in PC computer RGB format, in JPEG format without compression and a set of low resolution (600 x 800 pixels) digital images in PC computer RGB format, in JPEG format without compression.

**2. Content and Quality**

(a) Exposures shall include external and internal views, and special features of the completed project. Shots at night or at specified times may be required for external areas. Photograph locations are to be agreed with the Architect, and shall aim at representing the design intentions.

(b) The photographs shall be taken under the best possible conditions (such as shooting angle, sunlight direction, foreground and background associations, etc.), employing appropriate photographic techniques and equipment in producing high quality products (fine grain, appropriate field of depth, contrast, colour temperature and composition, etc.).

**3. Photographer and Resources**

At the start of the contract, the contractor shall obtain approval from the Architect on the photographer and resources to be employed for the job. The submission for approval shall include the name(s) of the photographer(s), his/her years of experience in architectural photography, camera type, brand and lens, job reference including a sample of works consisting of no more than five A4 size sheets. Once the resources are approved, any change must be justified and approved by the Architect again. This is intended to maintain consistent quality throughout the contract. Unsatisfactory work will be rejected and the contractor shall be required to re-take the photograph to replace the unsatisfactory work.

**4. Copyright**

The contents of all the photographs are copyright reserved and may not be reproduced, duplicated or used as advertisement in any manner without the written approval by The Director of Architectural Services.

**B. Video Records**

**1. Requirements to make Video Records of Project**

The video records are intended to be taken for projects that are large in size and have high complexity, special design features, pioneering construction techniques, special nature or scope of works and/or special site conditions or locations. In general, projects in the high cost range – e.g. projects with an approval project estimate of $400M or above and with special features will normally have a requirement to make video records.

**2. Content, Format, Quantity and Quality**

(a) Stage I – Contract Commencement :

(i) Discuss with the Architect the main theme and duration of the project video. Examples of main theme could be as follows :

- Key events from project inception (or commencement) to completion;
- Narrative of special topics (an advance curtain wall system, new pre-fabrication system, special environment protection features);
- The completed facilities and functions, including introduction of the building, the facilities, spaces, building services or any other functional systems, the building with users in action, etc.; and
- Any others as decided by the Architect.

(ii) The following is the scope of work required :

- Length of raw unedited footage : minimum 450 minutes (min. 15 minutes each visit) in DV format
- Length of edited video :. 18 minutes
- Estimated number of visits : minimum 30 visits (increases if contract is extended)
- Voice over language(s) : Cantonese (primary) and English versions
- Captions : Captions in the same language as the voice script for each of the Cantonese and English versions
- No. of draft version : 1st Draft: one
  2nd Draft: two (Cantonese / English)
  Final version: two (Cantonese / English)
- Copies of each final version : VCD: two each language
  DVD: two each language
- All items shall be fully labelled and indexed on the items and on the containers/holders.

(iii) Produce outline storyboard (there is no need to prepare a detailed script at this stage) and agree with the Architect the schedule of the visits and key production dates.

(iv) When routine footages are to be captured throughout the contract period, at contract commencement, visit the site and submit a DVD with minimum 20 minutes trial shots from various angles and locations for the Architect to select and agree in principle for routine shooting.

(b) Stage II – During Construction :

(i) Capture site footages according to the agreed schedule. Allow for 5 additional visits throughout the contract for shooting special unscheduled events, as instructed by the Architect. These footages shall be kept with the contractors for later use.

(ii) Video footages must be taken at the intervals as agreed and as scheduled. Original DV footage must be kept with the contractor for later editing and a DVD copy of the footage must be submitted to the Architect within 7 days after the shooting for viewing and record purpose.

(c) Stage III – At Contract Completion :

(i) Discuss and obtain the confirmation from the Architect about the finalised detailed storyboard for the video. Produce the draft script in Cantonese for the approval of the Architect. Once the Cantonese version is approved, produce the translated English version for final approval.

(ii) Compile an animation showing the growth per month, from contract start to completion of the new building(s). Images shall be assembled from the video or photographs on agreed fixed dates and at fixed viewing angles throughout the construction period, as required by the contract. A time bar must be included to illustrate progress of the work versus time. This animation shall form part of the final edited video.

(iii) Submit detailed time schedule for any additional shooting required for the final version, editing, proof-reading first draft, second draft and final versions.

(iv) Upon completion, submit to the Architect all items as required and specified in para. B2(a)(ii) above.

**3. Video Camera Recording Team and Resources**

At the start of the contract, the contractor shall obtain approval from the Architect on the video camera recording team and resources employed for the job. The submission for approval shall include the name(s) of the video camera recording team members, member's years of experience in video camera recording, equipment type, job reference, etc. Once the resources are approved, any change must be justified and approved by the Architect again. This is intended to maintain consistent quality throughout the contract. Unsatisfactory work will be rejected and the contractor shall be required to re-take the video footage to replace the unsatisfactory work.

**4. Copyright**

The video must be captioned with the copyright sign, date and "Produced by Architectural Services Department" at the end. The contents of the video and all raw footages captured are copyright reserved. They may not be produced, duplicated or used as advertisement in any manner without the written approval by The Director of Architectural Services.

## Part VII - Requirements of Documents to be handed over for Topographical Surveys

### 1. General Requirement

(a) All planimetric details shall be in terms of the Hong Kong 1980 Grid System.
(b) All levels, heights, depths and contours shall be in terms of Hong Kong Principal Datum.

### 2. Presentation of Drawings

(a) Materials

Survey submissions shall be in 0.l mm (minimum) thick translucent material, dimensionally stable and suitable for reproduction and microfilming.

(b) Format

(i) All survey drawings shall be produced on standard sheets of Bl size 1000 mm x 707 mm with Title and Information Panel unless otherwise specified.

(ii) Grid lines shall be shown at 100 mm intervals by crosses. Co-ordinates values shall be shown outside the details, or at sheet edges at 100 mm intervals in a neat and legible form. Grid intervals for other scales of drawings shall be specified otherwise.

(iii) A key plan showing the surveyed area shall be shown on each drawing.

(iv) The details shall generally be set out on the drawing in the middle of each drawing and a North Point added.

(v) Names and annotations shall be aligned parallel to horizontal grids except for names relating to linear features which shall be aligned parallel to those features.

(vi) The overlap of adjacent drawings shall give not less than 50 mm of details common to each drawing.

(vii) In the case of multi- sheet tasks, a sheet diagram shall be drawn in the space provided on the Information Panel of each sheet.

(c) Linework and Lettering

All linework and lettering on survey drawings must be sufficiently clear and dense to permit dyeline and other copies to be readily obtainable from the original.

(d) Symbols and Abbreviations

Features should be shown in accordance with "Survey and Drafting Specifications 1994" and all current amendments thereto issued by Hong Kong Government Engineering Survey Offices, which may be inspected at or obtainable from Survey Division, Civil Engineering and Development Department, Civil Engineering Building, 6th floor, 101 Princess Margaret Road,, Kowloon. Other features should be described in full. In certain circumstances it may be necessary to use additional abbreviations which shall then be added to the Information Panel of the particular drawing(s).

(e) Contour Interval

The contour interval for 1:200 and 1:500 pans shall be 0.5 and 1.0 metre respectively.

(f) Scale of Plan to be Plotted

Plotting shall be at the scale of 1 to 200.

**3. Computer Diskette**

(a) Provide two sets of CD-ROM computer disk.

(b) All the as-built drawings shall be produced with CAD, with the format capable of being read by AutoCAD 2000/2004/2007/2008 in an "IBM PC compatible" computer and to the satisfaction of the Architect. The layers used for as-built drawings in CAD format shall follow the standard of ArchSD CAD Layering System, details of which shall be provided by the Architect to the Contractor if so requested.

(c) Each computer disk shall be labelled, with cross reference to a printed list of files explaining the contents and purpose of each file and supplied in sturdy plastic containers.

(d) If any file on any disk proves to be unreadable, the Contractor shall supply a fresh copy of the disk, with all files thereon, free of charge.

(e) The Contractor shall certify that the survey information on the computer disk and on the negative are identical. Any ambiguity or discrepancy shall be rectified by the Contractor.

**4. Document to be Delivered**

(a) Control Survey

(i) The Contractor shall supply a list of the co-ordinates and levels for all the control stations and bench marks established and/or used for the Survey.

(ii) The Contractor shall supply Horizontal Control Diagrams and Vertical Control Diagrams.

(iii) The Contractor may be requested to supply a full error analysis for each horizontal and vertical control network established for the Survey.

(b) Field Document

The Contractor shall supply copies of field notes showing all the point numbers, measurements, observations and sketches of the Survey.

(c) Computation

The Contractor may be requested to supply copies of all the computations for the Survey.

(d) Survey Result

(i) The Survey information is to be submitted in the form of one set of original drawings in translucent material as specified and two copies each of paper prints. The original drawings are to be signed by the Contractor to certify the authenticity of the Survey and that the Survey has been carried out to the standards specified in the contract.

(ii) The description, value and exact location of the bench marks are to be clearly shown on the survey plan, by enlarged diagram if necessary. Except otherwise stated in the tender documents, a minimum of two Temporary Bench marks per site is required and if location is not specified it shall be determined by the Contractor or as directed by the Architect.

(iii) If site boundary points and co-ordinates are provided on the drawings attached with the tender document, the Contractor is required to plot the site boundary on the survey plan as required.

(iv) In addition to Clause 4(d)(i), the Contractor is required to submit survey information as described in Clauses 4(d)(i) to 4(d)(iii) on separate computer disk as specified for each item.

(v) Where rectification of Survey information is required after submission, the Contractor shall correct and re-submit the Survey information within 7 days from the date of the Architect's instruction.