



ARCHITECTURAL STRUCTURE

Week 7: Technical Drawing

Outline

1
INTRODUCTION

Aims
LOs

2
SEMINAR

- GROUP DISCUSSION
- GROUP RECAP

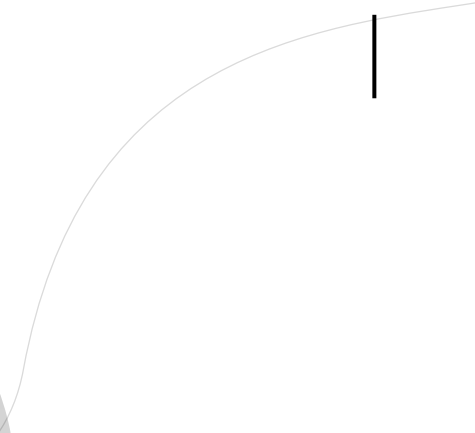




3
LECTURE
▪ WHAT IS TECHNICAL DRAWING



4
HANDS-ON EXERCISE
• BUILDING SURVEY
• MAKING DRAWINGS
• REFLECTIONS



Aims and objectives

- To understand the **rationale** of producing architectural (technical) drawings
- To gain knowledge on **what to include** in technical drawings
- To further understand **how to produce** technical drawings

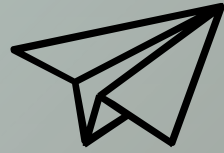
Learning outcomes

Students will be able to..

- 01** Be able to enumerate **necessary information** to be included
—
- 02** Plan on **how to create a** set of basic technical drawings
—
- 03** **Produce** a set of technical drawings of a simple house (Assessment 1)

A news..

From Week 9 onwards, your learning will be turned into asynchronous online. There are no live sessions.



- 1. How much do you know**
about technical drawings?
- 2. Have you drawn** a technical
drawing before?

Common problem in practice:

- Incorrect or inconsistent **scales** being used across drawings.
- **Doors opening** the wrong way or with insufficient opening space (i.e. opening into other doors, cabinets, windows, etc.).
- Facilities located in **impractical places**.
- **Undersized**, impractical or awkward spaces.
- **Poorly detailed junctions** or abutments between different components or systems.
- Incorrect **symbols**.
- Inconsistent **revision numbers**.
- Poor **reproduction**.
- **Un-buildable**, or difficult to build elements.
- Missing **components**.
- **Inconsistent** information.
- Illegible **writing**.
- The use of **acronyms** that are not understood.
- **Notes** that are not understood.

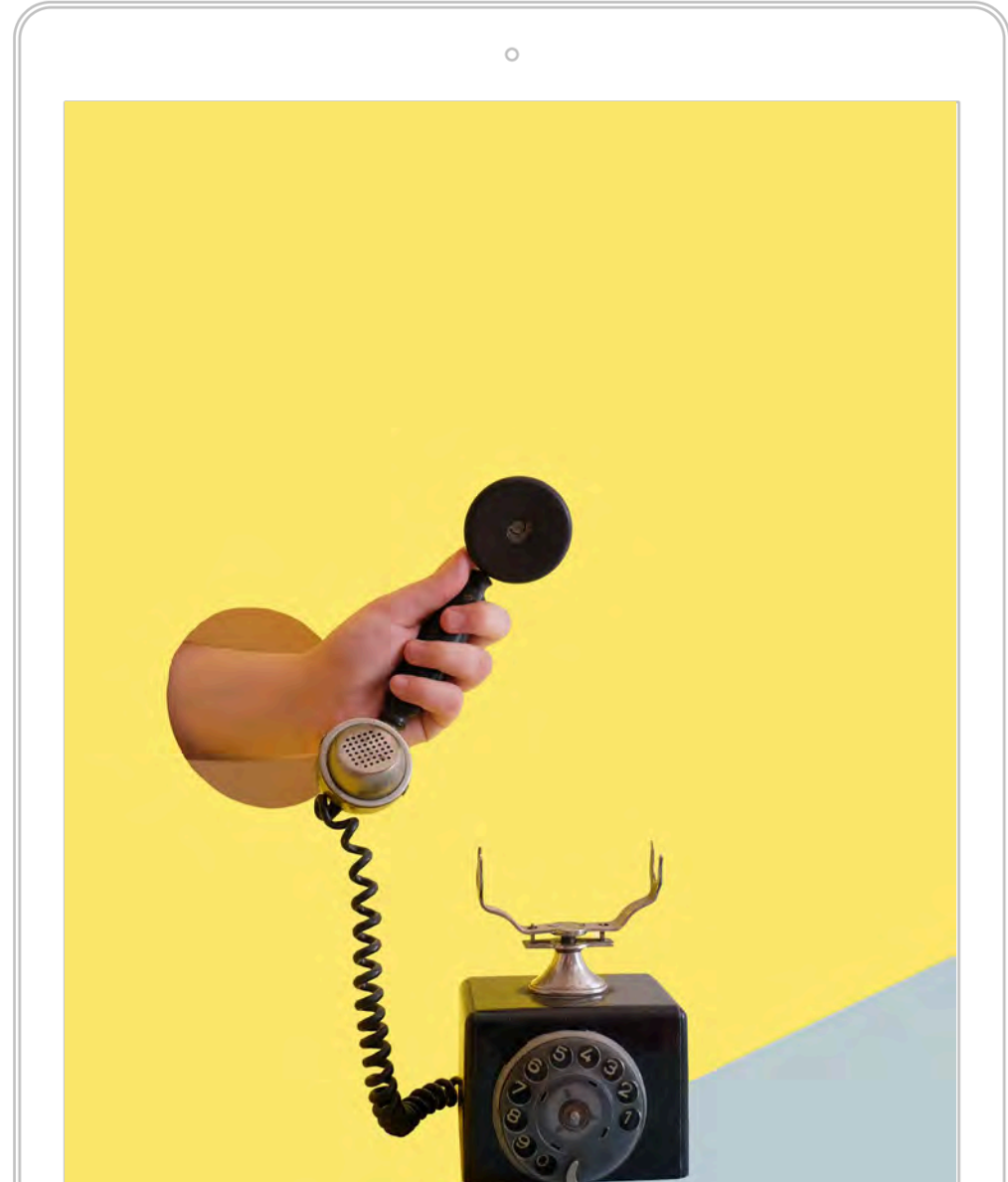
ACTIVITIES

1. ACTIVITY 1- DISCUSSION IN GROUPS (USE GUIDING QUESTIONS, VIA DISQUS): 35 MINS
2. SUBMIT GROUP ANSWERS: 5 MINS
3. GROUP RECAP: 10 MINS

LECTURE

4. ACTIVITY 2- BUILDING SURVEY EXERCISE: 70 MINS
5. SUBMIT INDIVIDUAL REFLECTIONS (DISQUS): 5 MINS

Photo by Elena Koycheva on Unsplash



ACTIVITY 1

**Submit via
PollEverywhere:**

<https://PollEv.com/surveys/VPuDWbzRyUXkm2mpWDyL/respond>



35 + 5 mins

DURATION

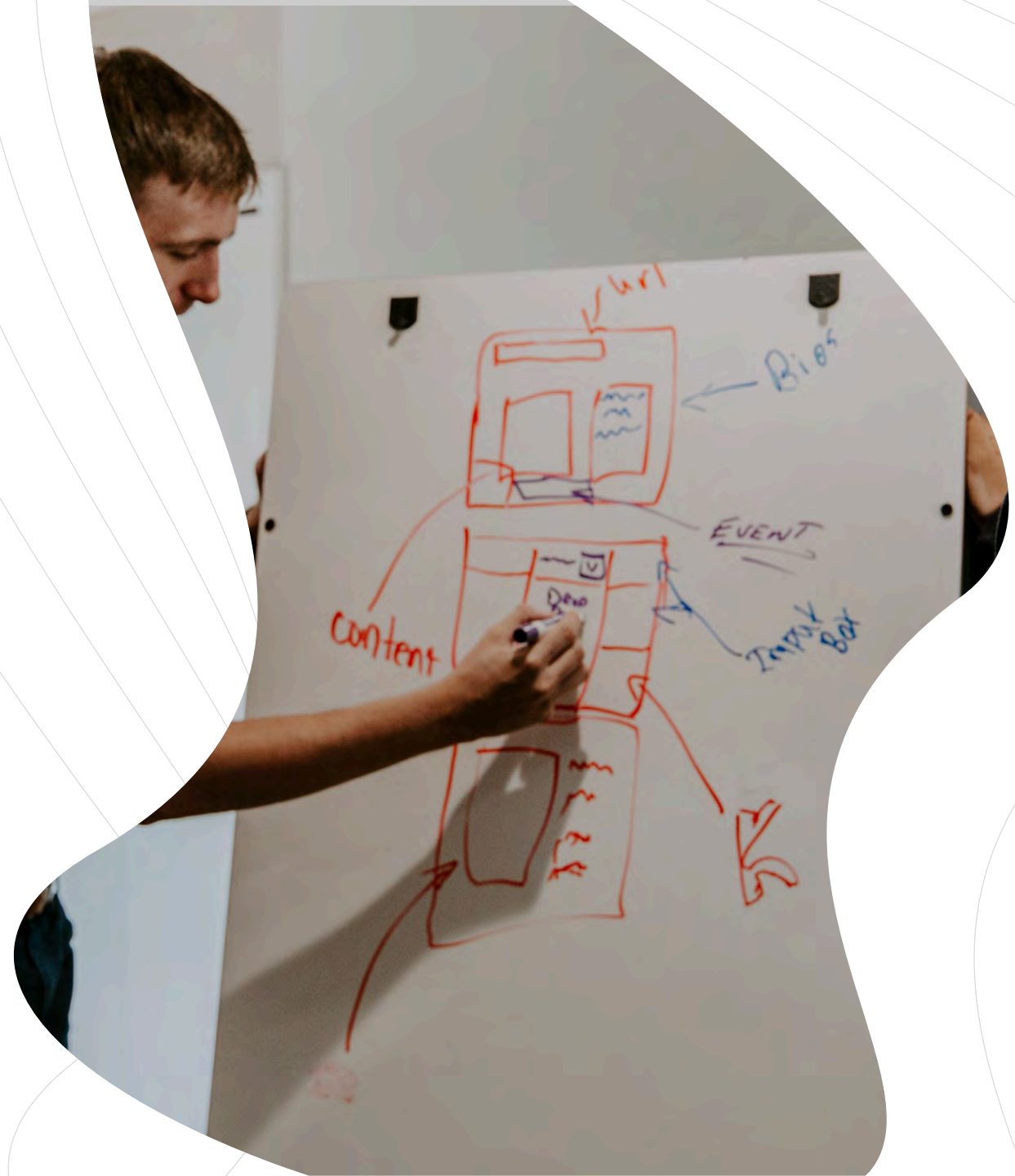
In your **presentation group**. Use these guiding questions to discuss:

1. **What is the purpose of technical drawings?**
2. **What kind of information is necessary to be included? List the absolute minimum information of each type of drawings (plan, elevation, etc..).**
3. **Who use them?**
4. **Who made them?**
5. **Who get to decide on the drawing convention (scale, template, etc?)**
6. **In what stages of architecture project technical drawings are used?**
7. **What do the dotted lines represent?**
8. **Why are there different hatching styles?**

GROUP RECAP:

PollEverywhere:

<https://PollEv.com/surveys/VPuDWbzRyUXkm2mpWDyL/respond>



Part 1: Road map

Project team



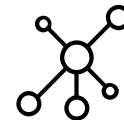
CLIENT TEAM

The commissioning team.



DESIGN TEAM

The team which is responsible for the design of the building and producing information required to manufacture and construct it.



CONSTRUCTION TEAM

Team which is contracted under a contract to undertake construction works.



STAKEHOLDERS

Project stakeholders are any party outside the project team who might influence direction of the design or create a project constraint.



Design team



Core members are:

- Lead designer
- Principle designer (usually sub-function of the lead designer role)
- Designers: architect, interior designer, landscape architect, etc
- Engineers: civil and structural and building services engineers
- Cost consultant
- Construction advisor
- Specialist consultants (fire engineer, acoustic consultant, façade engineer, sustainability consultant, etc..)

Core task in architecture projects:

- Agree appointments with the **professional team**
- Develop a **brief** with the client
- Create **concept designs** options
- **Coordinate** the design
- Prepare a **planning application**
- Apply for **planning consent**
- Develop a set of **construction information**
- Prepare a **tender**
- Obtain **consents** required **prior to construction**
- Award a **Building Contract**
- **Construct** the building
- **Inspect** the construction as it progresses
- **Hand over** the building.

RIBA. (2020). *RIBA Plan of Work* [Online]. Available: <https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work> [Accessed April 20th 2021].

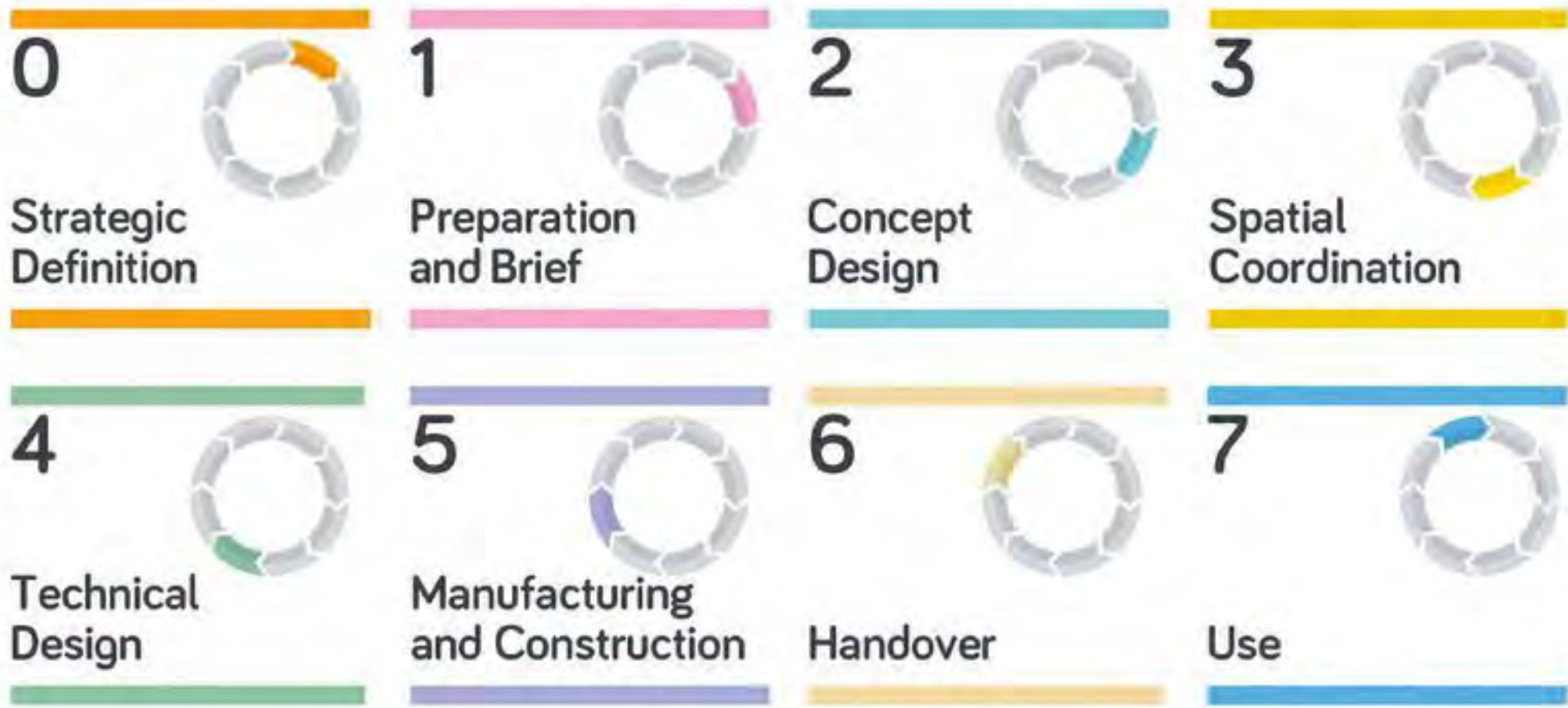
Same goal:
 Providing project team
 with a **road map** for
 promoting consistency
 from one stage to the
 next.
 To provide vital
 guidance to clients.

RIBA. (2020). *RIBA Plan of Work* [Online].
 Available:
<https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work> [Accessed April 20th 2021].

	Pre-Design		Design				Construction	Handover	In Use	End of Life
	0	1	2		3	4	5	6	7	
RIBA (UK)	Strategic Definition	Preparation and Brief	Concept Design	NOT USED	Developed Design	Technical Design	Construction	Handover & Close Out	In Use	NOT USED
ACE (Europe)	0	1	2.1	2.2	2.3	2.4	3		4	5
	Initiative	Initiation	Concept Design	Preliminary Design	Developed Design	Detailed Design	Construction	NOT USED	Building Use	End of Life
AIA (USA)			-		-	-	-			
	NOT USED	NOT USED	Schematic Design	NOT USED	Design Development	Construction Documents	Construction	NOT USED	NOT USED	NOT USED
APM (Global)	0	1	2		3	4	5	6	7	
	Strategy	Outcome Definition	Feasibility	NOT USED	Concept Design	Detailed Design	Delivery	Project Close	Benefits Realisation	NOT USED
Spain			-			-	-	-		
	NOT USED	NOT USED	Proyecto Básico	NOT USED	NOT USED	Proyecto de Ejecución	Dirección de Obra	Final de Obra	NOT USED	NOT USED
NATSPEC (Aus)		-	-	-	-	-	-		-	
	NOT USED	Establishment	Concept Design	Schematic Design	Design Development	Contract Documentation	Construction	NOT USED	Facility Management	NOT USED
NZCIC (NZ)		-	-	-	-	-	-		-	
	NOT USED	Pre-Design	Concept Design	Preliminary Design	Developed Design	Detailed Design	Construct	NOT USED	Operate	NOT USED
Russia			-	-	-	-	-			
	NOT USED	NOT USED	AGR Stage	Stage P	Tender Stage	Construction Documents	Construction	NOT USED	NOT USED	NOT USED
South Africa		1	2	3	-	4	5			
	NOT USED	Inception	Concept and Viability	Design Development	NOT USED	Documentation	Construction	Close Out	NOT USED	NOT USED

Figure 1: Comparison of international plans of work

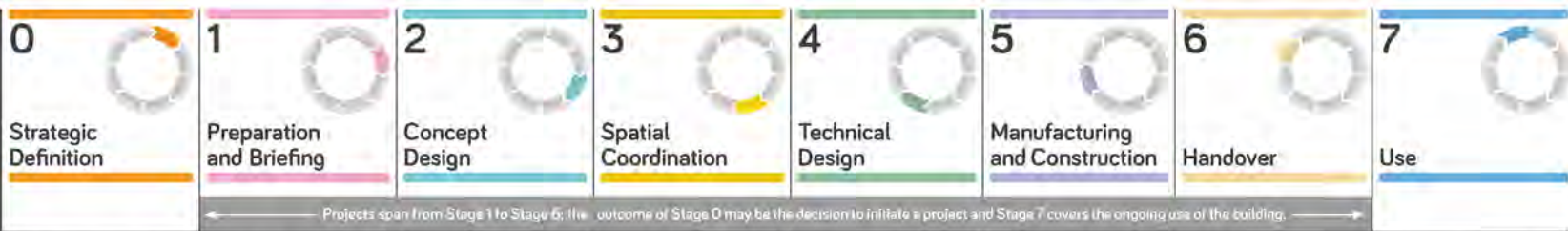
RIBA 2020





RIBA
Plan of Work
2020

The RIBA Plan of Work organises the process of briefing, designing, delivering, maintaining, operating and using a building into eight stages. It is a framework for all disciplines on construction projects and should be used solely as guidance for the preparation of detailed professional services and building contracts.



Stage Boundaries:
Stages 0-4 will generally be undertaken one after the other.
Stages 4 and 5 will overlap in the **Project Programme** for most projects.
Stage 5 commences when the contractor takes possession of the site and finishes at **Practical Completion**.
Stage 6 starts with the handover of the building to the client immediately after **Practical Completion** and finishes at the end of the **Defects Liability Period**.
Stage 7 starts concurrently with Stage 6 and lasts for the life of the building.

Planning Note:
Planning Applications are generally submitted at the end of Stage 5 and should only be submitted earlier when the threshold of information required has been met. If a **Planning Application** is made during Stage 3, a mid-stage gateway should be determined and it should be clear to the project team which tasks and deliverables will be required. See **Overview guidance**.

Procurement:
The RIBA Plan of Work is procurement neutral – See **Overview guidance** for a detailed description of how each stage might be adjusted to accommodate the requirements of the **Procurement Strategy**.
ER Employer's Requirements
CP Contractor's Proposals

Stage Outcome at the end of the stage	0 Strategic Definition	1 Preparation and Briefing	2 Concept Design	3 Spatial Coordination	4 Technical Design	5 Manufacturing and Construction	6 Handover	7 Use
Stage Outcome at the end of the stage	The best means of achieving the Client Requirements confirmed If the outcome determines that a building is the best means of achieving the Client Requirements , the client proceeds to Stage 1	Project Brief approved by the client and confirmed that it can be accommodated on the site	Architectural Concept approved by the client and aligned to the Project Brief The brief remains "live" during Stage 2 and is derogated in response to the Architectural Concept	Architectural and engineering information Spatially Coordinated	All design information required to manufacture and construct the project completed Stage 4 will overlap with Stage 5 on most projects	Manufacturing, construction and Commissioning completed There is no design work in Stage 5 other than responding to Site Queries	Building handed over, Aftercare initiated and Building Contract concluded	Building used, operated and maintained efficiently Stage 7 starts concurrently with Stage 6 and lasts for the life of the building
Core Tasks during the stage	Prepare Client Requirements Develop Business Case for feasible options including review of Project Risks and Project Budget Ratify option that best delivers Client Requirements Review Feedback from previous projects Undertake Site Appraisals <i>Project Strategies might include:</i> - Conservation (if applicable) - Cost - Fire Safety - Health and Safety - Inclusive Design - Planning - Plan for Use - Procurement - Sustainability See RIBA Plan of Work 2020 Overview for detailed guidance on Project Strategies	Prepare Project Brief including Project Outcomes and Sustainability Outcomes , Quality Aspirations and Spatial Requirements Undertake Feasibility Studies Agree Project Budget Source Site Information including Site Surveys Prepare Project Programme Prepare Project Execution Plan	Prepare Architectural Concept incorporating Strategic Engineering requirements and aligned to Cost Plan , Project Strategies and Outline Specification Agree Project Brief Derogations Undertake Design Reviews with client and Project Stakeholders Prepare stage Design Programme	Undertake Design Studies , Engineering Analysis and Cost Exercises to test Architectural Concept resulting in Spatially Coordinated design aligned to updated Cost Plan , Project Strategies and Outline Specification Initiate Change Control Procedures Prepare stage Design Programme	Develop architectural and engineering technical design Prepare and coordinate design team Building Systems information Prepare and integrate specialist subcontractor Building Systems information Prepare stage Design Programme Specialist subcontractor designs are prepared and reviewed during Stage 4	Finalise Site Logistics Manufacture Building Systems and construct building Monitor progress against Construction Programme Inspect Construction Quality Resolve Site Queries as required Undertake Commissioning of building Prepare Building Manual Building handover tasks bridge Stages 5 and 6 as set out in the Plan for Use Strategy	Hand over building in line with Plan for Use Strategy Undertake review of Project Performance Undertake seasonal Commissioning Rectify defects Complete initial Aftercare tasks including light touch Post Occupancy Evaluation	Implement Facilities Management and Asset Management Undertake Post Occupancy Evaluation of building performance in use Verify Project Outcomes including Sustainability Outcomes Adaptation of a building (at the end of its useful life) triggers a new Stage 0
Core Statutory Processes during the stage:	Strategic appraisal of Planning considerations	Source pre-application Planning Advice Initiate collation of health and safety Pre-construction Information	Obtain pre-application Planning Advice Agree route to Building Regulations compliance Option: submit outline Planning Application	Review design against Building Regulations Prepare and submit Planning Application See Planning Note for guidance on submitting a Planning Application earlier than at end of Stage 5	Submit Building Regulations Application Discharge pre-commencement Planning Conditions Prepare Construction Phase Plan Submit form F10 to HSE if applicable	Carry out Construction Phase Plan Comply with Planning Conditions related to construction	Comply with Planning Conditions as required	Comply with Planning Conditions as required
Procurement Route	Traditional	Traditional	Traditional	Traditional	Traditional	Traditional	Traditional	Traditional
Design & Build 1 Stage								
Design & Build 2 Stage	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP
Management Contract	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP
Construction Management	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP
Contractor-led	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP	ER CP
Information Exchanges at the end of the stage	Client Requirements Business Case	Project Brief Feasibility Studies Site Information Project Budget Project Programme Procurement Strategy Responsibility Matrix Information Requirements	Project Brief Derogations Signed off Stage Report Project Strategies Outline Specification Cost Plan	Signed off Stage Report Project Strategies Updated Outline Specification Updated Cost Plan Planning Application	Manufacturing Information Construction Information Final Specifications Residual Project Strategies Building Regulations Application	Building Manual including Health and Safety File and Fire Safety Information Practical Completion certificate including Defects List Asset Information If Verified Construction Information is required, verification tasks must be defined	Feedback on Project Performance Final Certificate Feedback from light touch Post Occupancy Evaluation	Feedback from Post Occupancy Evaluation Updated Building Manual including Health and Safety File and Fire Safety Information as necessary

4



Technical Design

The RIBA Plan of Work organises the process of briefing, designing, delivering, maintaining, operating and using a building into eight stages. It is a framework for all disciplines on construction projects and should be used solely as guidance for the preparation of detailed professional services and building contracts.

Stage Outcome

at the end of the stage

All design information required to manufacture and construct the project completed

Stage 4 will overlap with Stage 5 on most projects

Core Tasks

during the stage

Develop architectural and engineering technical design

Prepare and coordinate design team **Building Systems** information

Prepare and integrate specialist subcontractor **Building Systems** information

Prepare stage **Design Programme**

Specialist subcontractor designs are prepared and reviewed during Stage 4

Project Strategies might include:

- Conservation (if applicable)
- Cost
- Fire Safety
- Health and Safety
- Inclusive Design
- Planning
- Plan for Use
- Procurement
- Sustainability

See *RIBA Plan of Work 2020 Overview* for detailed guidance on **Project Strategies**

Information Exchanges

at the end of the stage

Manufacturing Information

Construction Information

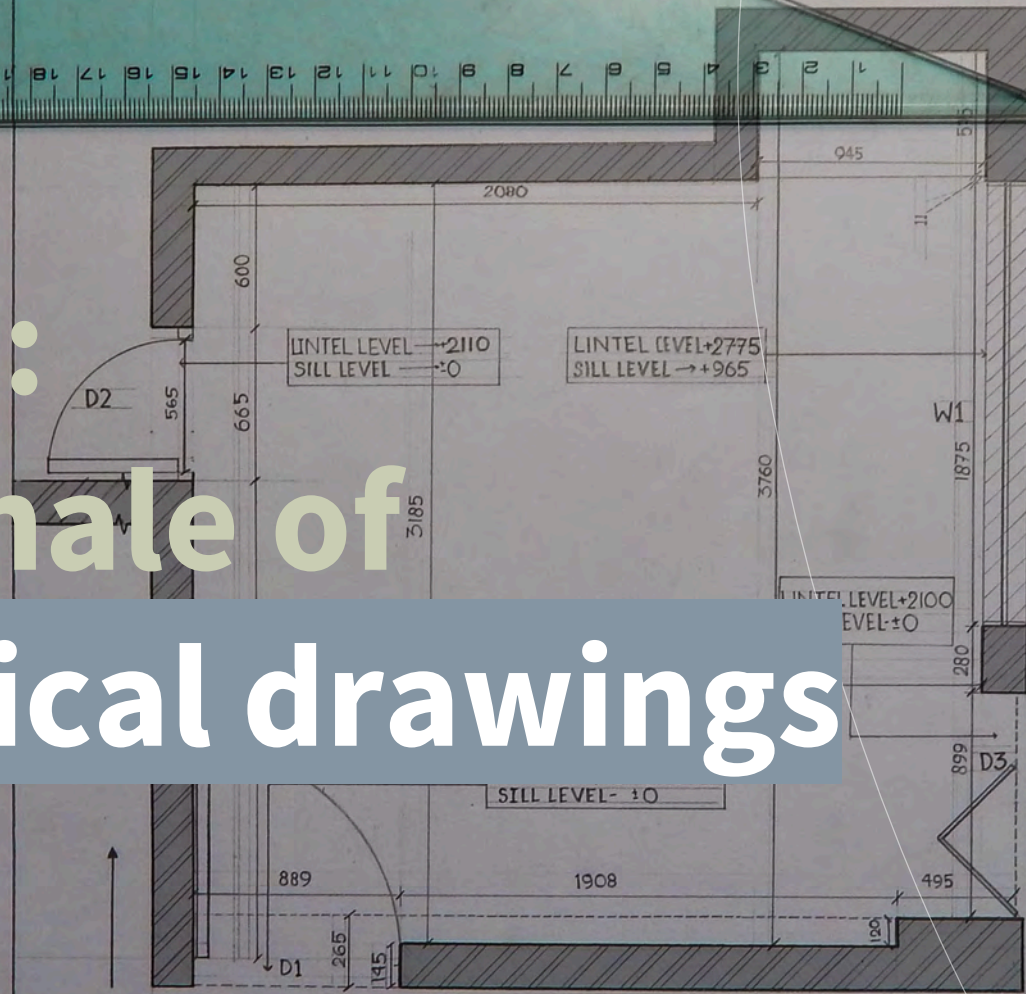
Final Specifications

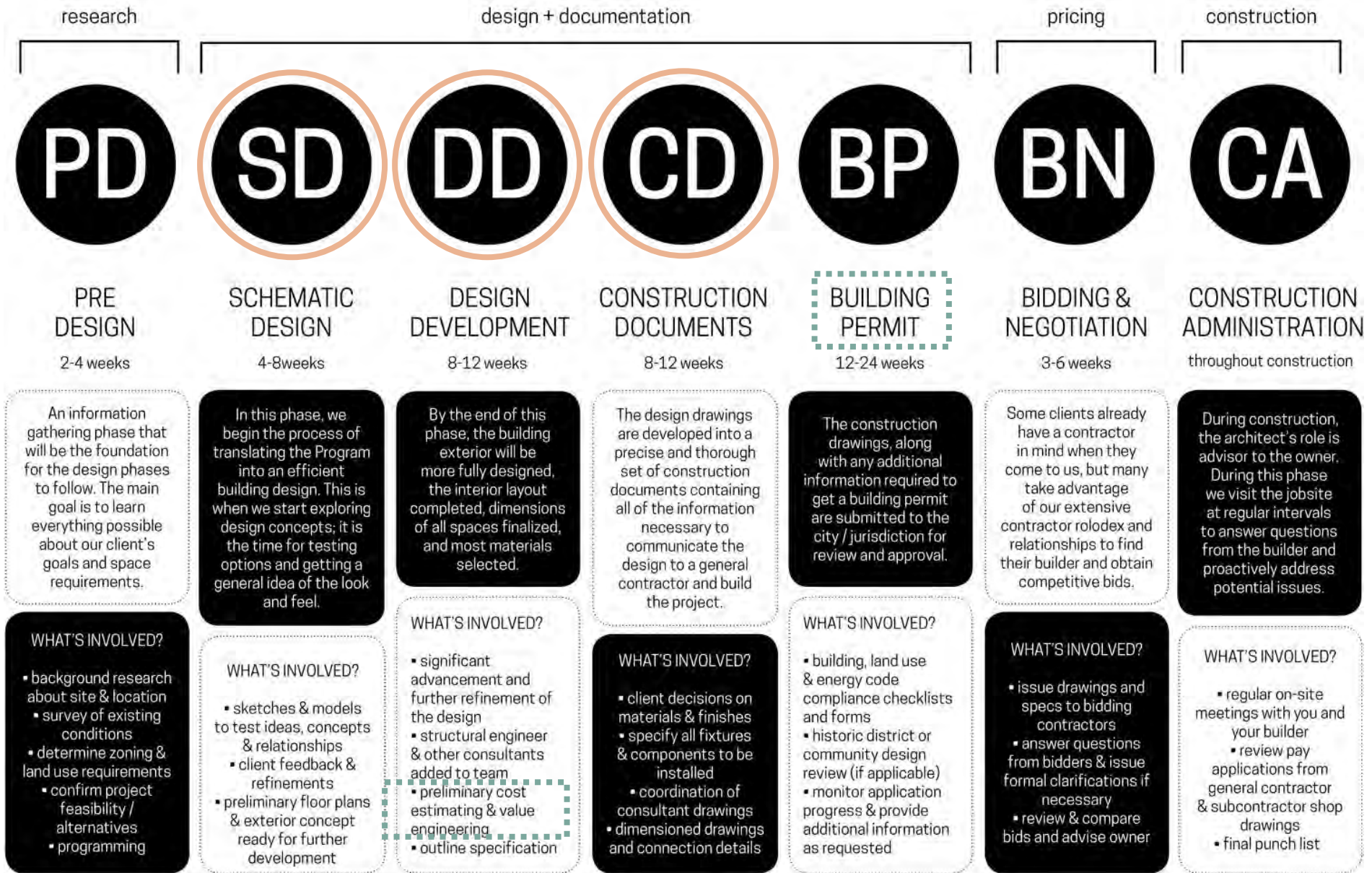
Residual Project Strategies

Building Regulations Application



Part 2: Rationale of technical drawings



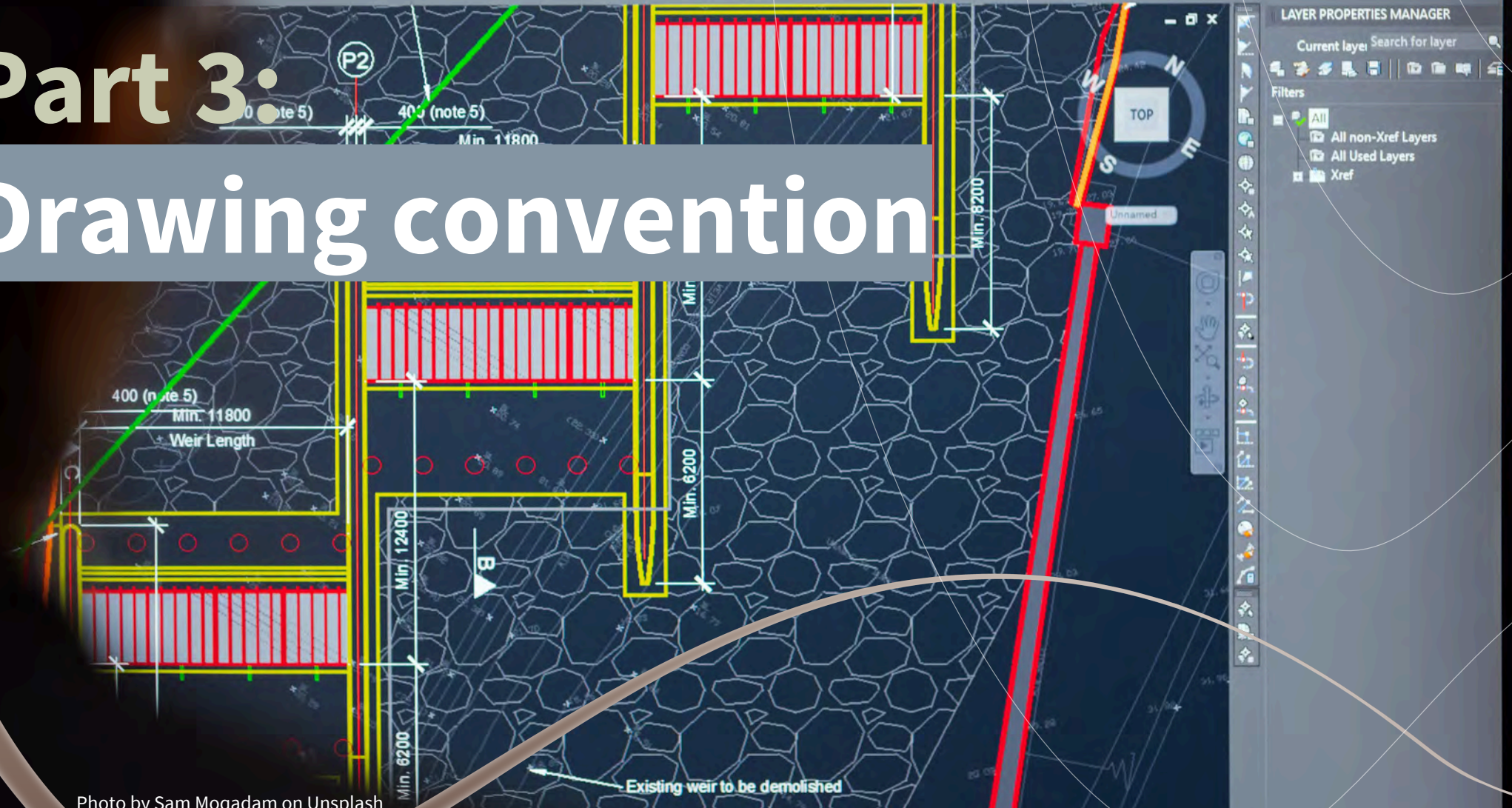


Why do we need to make technical drawings?

Apart from building information to be conveyed to other parties, we want to make sure that all cost will be included. As the architect we need to **specify so they can be calculated**. Also to provide visualisation to authority to obtain building permit.

Information Exchanges at the end of the stage	Manufacturing Information Construction Information Final Specifications Residual Project Strategies Building Regulations Application
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Part 3: Drawing convention



SUMMARY:

Parallel projections

Paper formats

Boundary lines

Grid

Scale

North arrow

Architectural lines

Architectural lettering

Material hatching

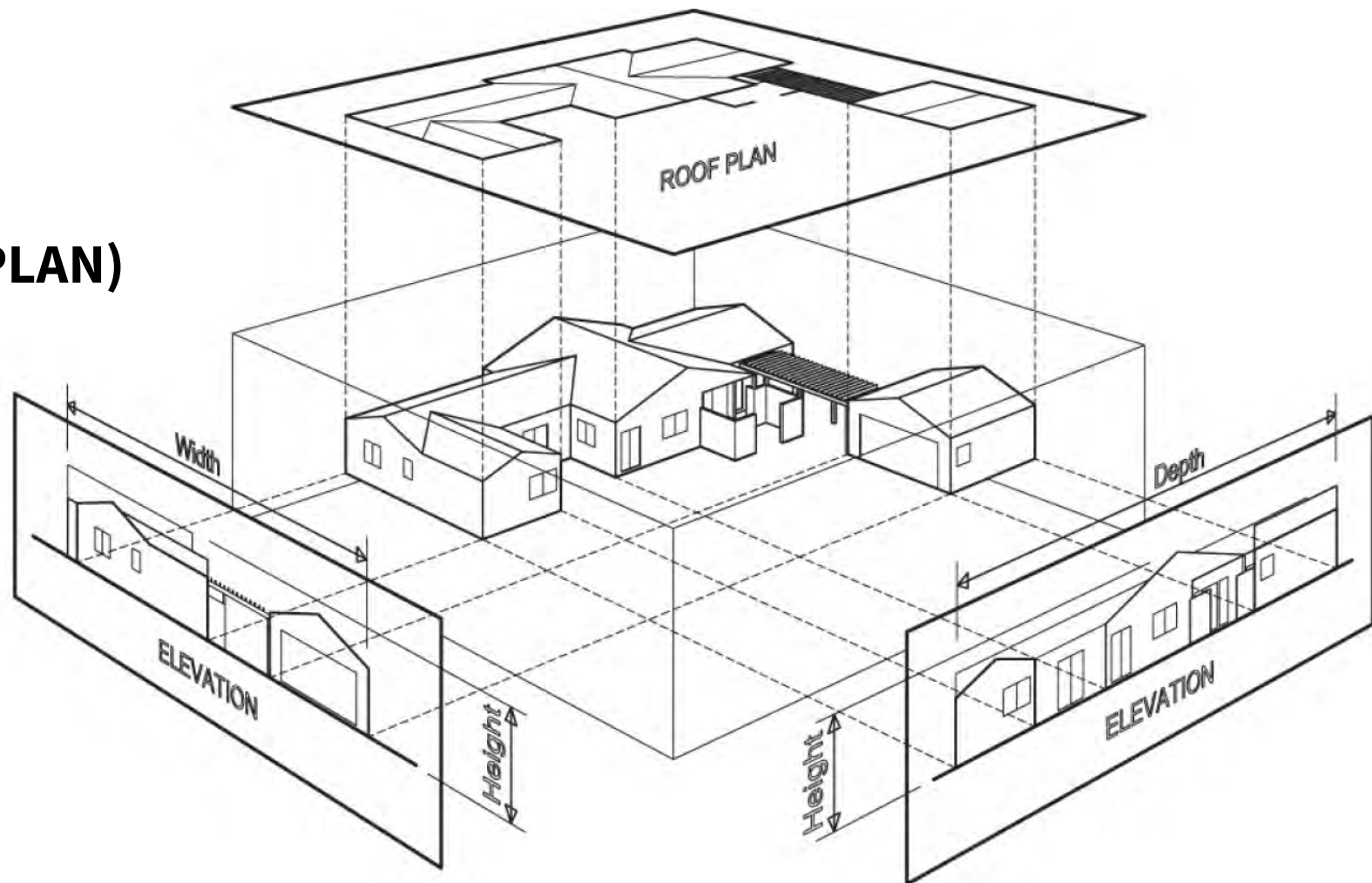
Dimensions

Symbols

Legibility of drawings

Parallel projections

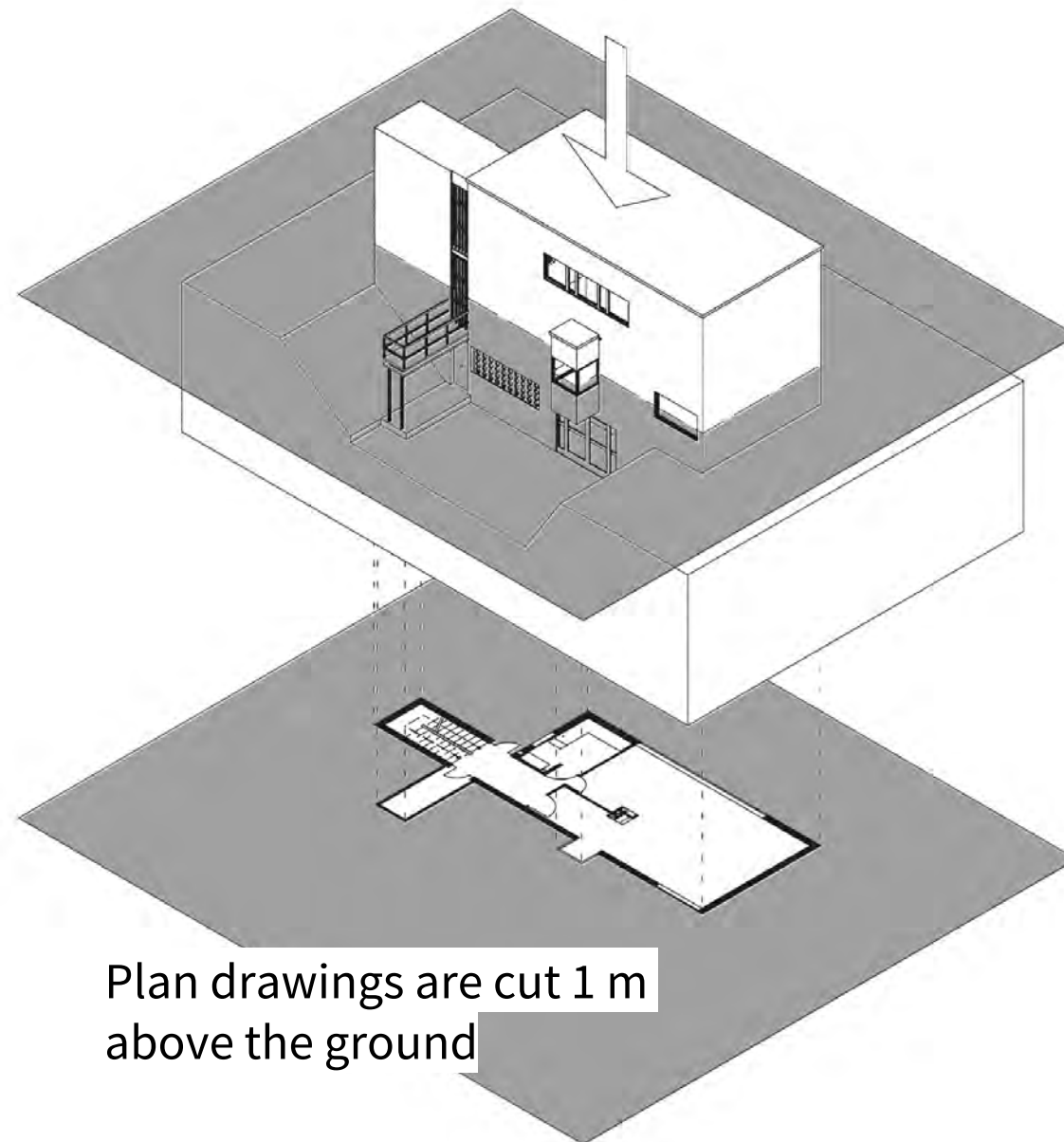
TOP VIEW (ROOF PLAN)
PLAN VIEW
ELEVATION
SECTION



Wakita, O. A. & Linde, R. M. (2003). *The professional practice of architectural working drawings*, John Wiley & Sons.

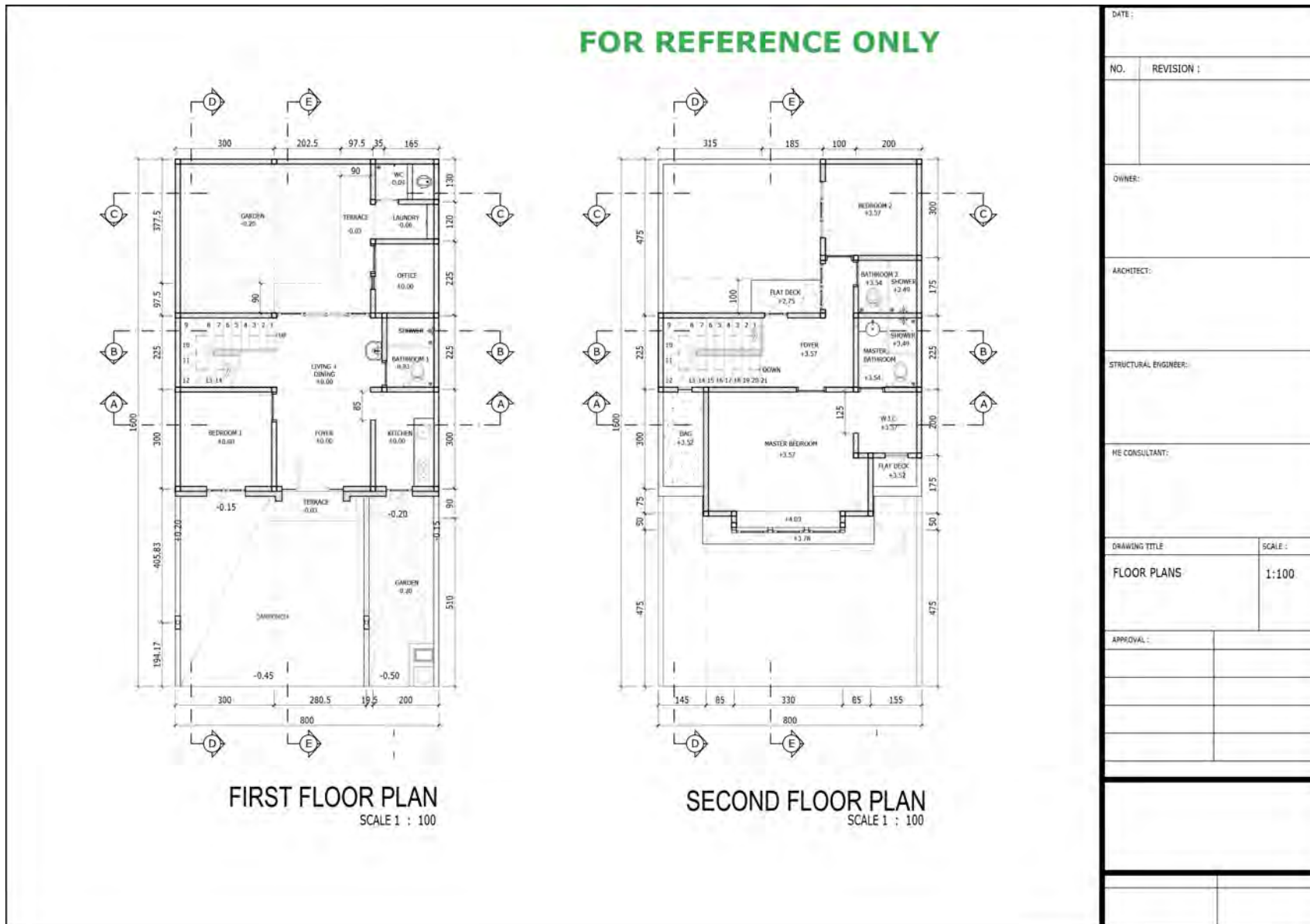
Parallel projections

TOP VIEW (ROOF PLAN)
PLAN VIEW
ELEVATION
SECTION



Bielefeld, B. & Skiba, I. (2017). *Basics technical drawing*, Birkhäuser.

Paper formats



TEMPLATE:

- Date
- Revision number
- Owner (full address) or project location
- Architect (full address including contact number)
- Consultants (full address)
- Drawing title
- Scale
- Changes made
- Project name

Paper sizes: A0, A1, A2 or A3

Orientation: Landscape (mostly)

GRAPHIC SYMBOLS		
ABBREVIATION	CEILING SYMBOLS	ARCHITECTURAL ANNOTATION
AC AIR CON	AS/MS ASSETTE	AREA TAGS VENTILATION HOPE FLOOR FINISH FLOOR FINISH PLANTER/WATER FEATURE TAGS TOP LEVEL OF SOIL/WATER BOTTOM/FINISH LEVEL OF SOIL/WATER REFLECTED CEILING CEILING HEIGHT (CLEAR) CEILING FINISH/MATERIAL CH CEILING HEIGHT (CLEAR) CEILING FINISH/MATERIAL
L* MEP MECHANICAL, ELECTRICAL AND PLUMBING	VS CEILING SUSPENDED WALL SUSPENDED	ELEVATION SECTION
MS MILD STEEL MV MECHANICAL VENT NV NATURAL VENTILATION OP OUTGOING PIPE PC PRECAST CONCRETE P/S PLUMBING & SANITARY	CS CEILING SURFACE MOUNTED WEATHERPROOF FITTING RS RECESSED MOUNTED FLOOR FITTING (ROOM IN ROOM) MS RECESSED MOUNTED FLOOR FITTING	DEOR MEL DEOR SCHEDULE FIRE RATING VINDRWS/ VINDRWS SCHEDULE VINDRWS/ VINDRWS TYPE VE EXISTING FLOOR LEVEL/ EXISTING FLOOR LEVEL/ CEILING HEIGHT SHOWN IN ELEVATIONS AND SECTIONS VE EXISTING FLOOR LEVEL/ EXISTING FLOOR LEVEL/ CEILING HEIGHT SHOWN IN ELEVATIONS AND SECTIONS VE EXISTING FLOOR LEVEL/ EXISTING FLOOR LEVEL/ CEILING HEIGHT SHOWN IN ELEVATIONS AND SECTIONS VE EXISTING FLOOR LEVEL/ EXISTING FLOOR LEVEL/ CEILING HEIGHT SHOWN IN ELEVATIONS AND SECTIONS VE EXISTING FLOOR LEVEL/ EXISTING FLOOR LEVEL/ CEILING HEIGHT SHOWN IN ELEVATIONS AND SECTIONS
		FINISH FLOOR LEVEL AS SHOWN ON PLAN BASE LEVEL AS SHOWN ON PLAN ROAD LEVEL AS SHOWN ON PLAN CEILING HEIGHT AS SHOWN ON PLAN TOP OF WALL LEVEL
PLAN SYMBOLS		
		SETTING OUT POINT INVERT LEVELS SPOT LEVELS LAMP POINTS PROPOSED INSPECTION CHAMBER EXISTING MANHOLE PROPOSED MANHOLE
SANITARY FIXTURES		
		WB WASH BASIN MR HOOKER FT FLOOR TRAP UR URINAL WC WATER CLOSET TPH TOILET PAPER HOLDER + TAP POINT RB BATH TUB RSH BATH SHOWER MIXER SP TAP OF FLOOR WASTE

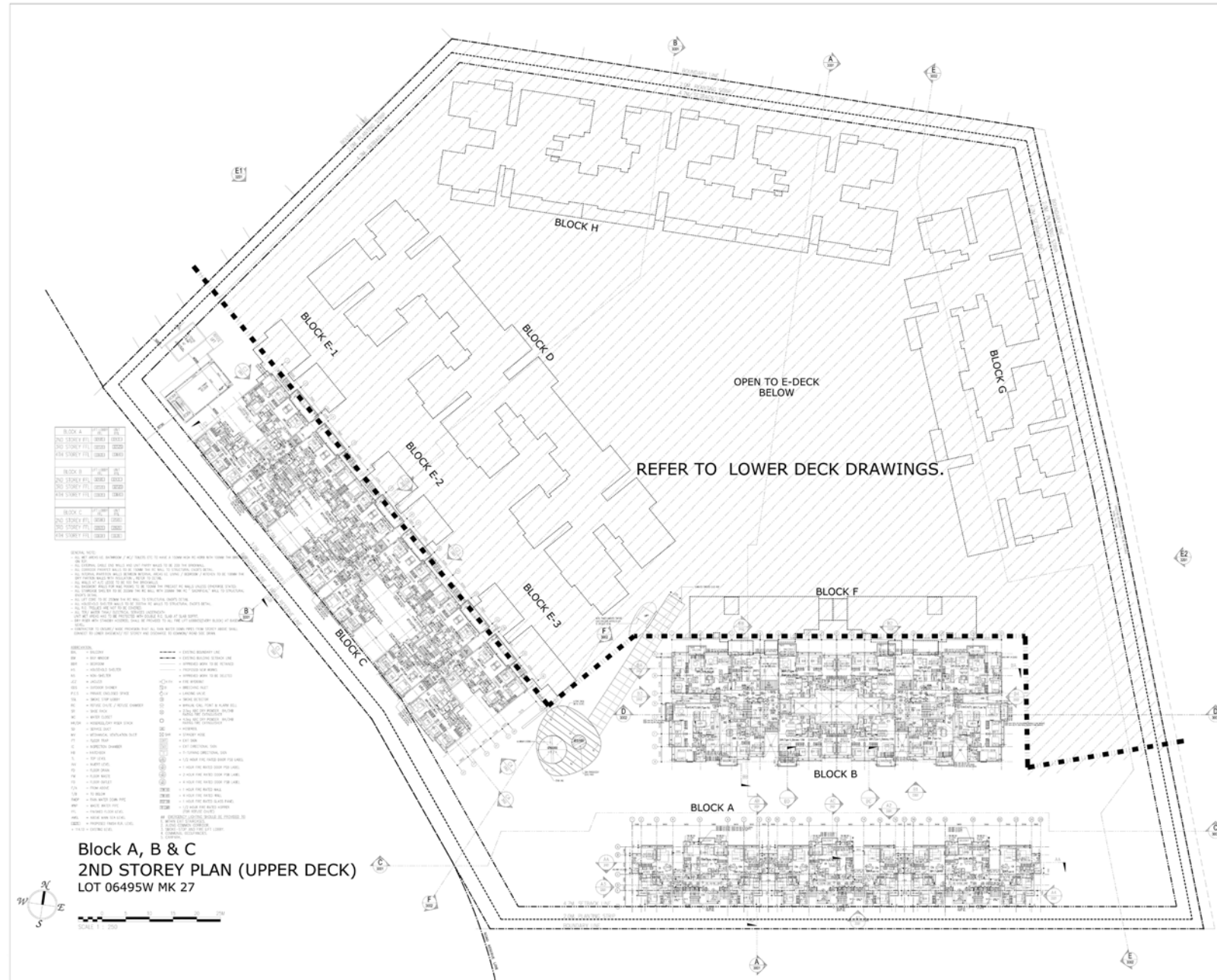
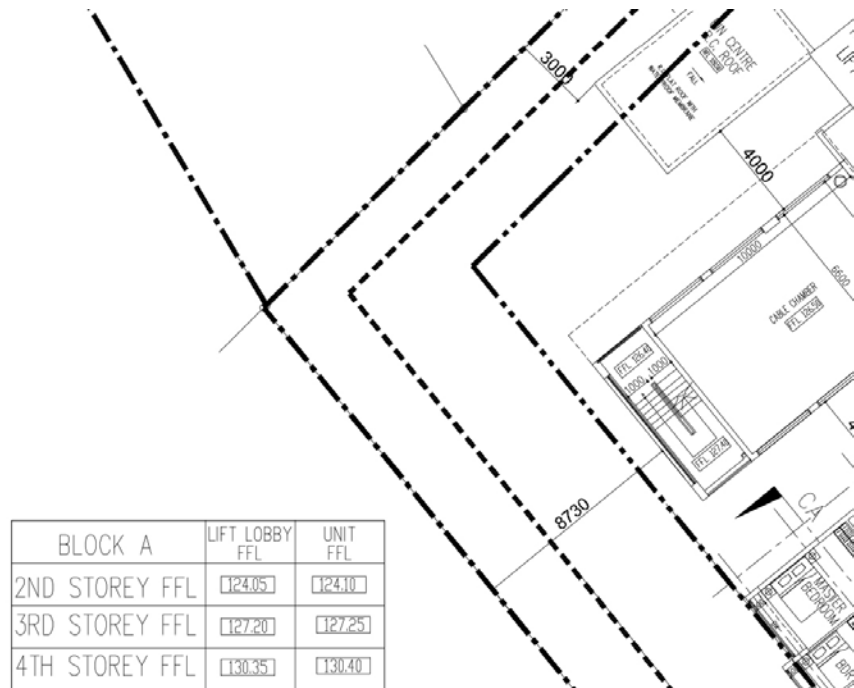
INDEX OF DRAWINGS - VOLUME 1	DWG NO	CONTENT	SCALE	SIZE	REV	REMARKS		
1000	10-1001	INDEX OF DRAWINGS-1	AS	A3	0			
	10-1000	SITE PLAN AND LOCATION PLAN	AS	A3	0			
	10-1002	SITE TOPO SURVEY - 1	AS	A3	0			
	10-1003	SITE TOPO SURVEY - 2	AS	A3	0			
2000	10-2001	BLOCK A & B UPPER BASEMENT 1 (UPPER DECK)	AS	A3	0			
	10-2002	BLOCK A, B & C - 1ST STOREY PLAN (UPPER DECK)	AS	A3	0			
	10-2003	BLOCK A, B & C - 2ND STOREY PLAN (UPPER DECK)	AS	A3	0			
	10-2004	BLOCK A, B & C - 3RD STOREY PLAN (UPPER DECK)	AS	A3	0			
	10-2005	BLOCK A, B & C - 4TH STOREY PLAN (UPPER DECK)	AS	A3	0			
	10-2006	BLOCK A, B & C - 5TH STOREY PLAN (UPPER DECK)	AS	A3	0			
	10-2007	BLOCK A, B & C - ROOF TERRACE PLAN (UPPER DECK)	AS	A3	0			
	10-2008	BLOCK A, B & C - ROOF PLAN (UPPER DECK)	AS	A3	0			
	10-2009	BLOCK D, E, F, G, & H - LOWER BASEMENT (LOWER DECK)	AS	A3	0			
	10-2010	BLOCK D, E, F, G, & H - 1ST STOREY PLAN (LOWER DECK)	AS	A3	0			
	10-2011	BLOCK D, E, F, G, & H - 2ND STOREY PLAN (LOWER DECK)	AS	A3	0			
	10-2012	BLOCK D, E, F, G, & H - 3RD STOREY PLAN (LOWER DECK)	AS	A3	0			
3000	10-3000	BLOCK A - UPPER BASEMENT 1 & 1ST STOREY PLAN (UPPER DECK)	AS	A3	0			
	10-3002	BLOCK A - 2ND TO 5TH STOREY PLAN (UPPER DECK)	AS	A3	0			
	10-3003	BLOCK A - ROOF TERRACE PLAN & ROOF PLAN (UPPER DECK)	AS	A3	0			
	10-3004	BLOCK B - UPPER BASEMENT 1ST TO 4TH STOREY PLAN (UPPER DECK)	AS	A3	0			
	10-3005	BLOCK B - 5TH STOREY TO ROOF PLAN (UPPER DECK)	AS	A3	0			
	10-3006	BLOCK C - 1ST, 2ND TO 4TH STOREY PLAN (UPPER DECK)	AS	A3	0			
	10-3007	BLOCK C - 5TH STOREY TO ROOF PLAN (UPPER DECK)	AS	A3	0			
	10-3008	BLOCK D - LOWER BASEMENT 1 & 1ST STOREY PLAN (LOWER DECK)	AS	A3	0			
	10-3009	BLOCK D - 2ND TO 4TH & 5TH STOREY PLAN (LOWER DECK)	AS	A3	0			
	10-3010	BLOCK D - ROOF TERRACE & ROOF PLAN (LOWER DECK)	AS	A3	0			
	10-3011	BLOCK E - LOWER BASEMENT 1ST & 2ND STOREY PLAN (LOWER DECK)	AS	A3	0			
	10-3012	BLOCK E - 3RD STOREY TO GREEN ROOF PLAN (LOWER DECK)	AS	A3	0			
	10-3013	BLOCK F - LOWER BASEMENT 1 & 1ST STOREY PLAN (LOWER DECK)	AS	A3	0			
	10-3014	BLOCK F - 2ND STOREY TO GREEN ROOF PLAN (LOWER DECK)	AS	A3	0			
	10-3015	BLOCK G - LOWER BASEMENT 1 & 1ST STOREY PLAN (LOWER DECK)	AS	A3	0			
	10-3016	BLOCK G - 2ND TO 4TH & 5TH STOREY PLAN (LOWER DECK)	AS	A3	0			
	10-3017	BLOCK H - LOWER BASEMENT 1 & 1ST STOREY PLAN (LOWER DECK)	AS	A3	0			
	10-3018	BLOCK H - 2ND TO 4TH & 5TH STOREY PLAN (LOWER DECK)	AS	A3	0			
	10-3019	BLOCK H - ROOF TERRACE & ROOF PLAN (LOWER DECK)	AS	A3	0			
	3000	10-3020	SITE SECTIONS A-A, B-B, D-D	AS	A3	0		
		10-3021	SITE SECTIONS B-B, E-E, F-F	AS	A3	0		
		10-3022	BLOCK A - SECTION AA, SECTION AB & SECTION AC	AS	A3	0		
		10-3023	BLOCK B - SECTION BA, SECTION BB, SECTION BC & SECTION BD	AS	A3	0		
	3000	10-3024	BLOCK C - SECTION CA & SECTION CB	AS	A3	0		
		10-3025	BLOCK D - SECTION DA & DD	AS	A3	0		
		10-3026	BLOCK E - SECTION EA & EB	AS	A3	0		
		10-3027	BLOCK F - SECTION FA, FB & FC	AS	A3	0		
		10-3028	BLOCK G - SECTION GA, GB & SECTION GC	AS	A3	0		
		10-3029	BLOCK H - SECTION HA, HB & HC	AS	A3	0		
		3000	10-3030	SITE ELEVATIONS - ELEVATION 1 & 2	AS	A3	0	
			10-3031	BLOCK A - ELEVATION 01, A2, A3 & A4	AS	A3	0	
			10-3032	BLOCK B - ELEVATION 01, B2, B3 & B4	AS	A3	0	
10-3033			BLOCK C - ELEVATION 01, C2, C3 & C4	AS	A3	0		
10-3034			BLOCK D - ELEVATION 01, D2, D3 & D4	AS	A3	0		
10-3035			BLOCK E - ELEVATION 01, E2, E3 & E4	AS	A3	0		
10-3036			BLOCK F - ELEVATION 01, F2, F3 & F4	AS	A3	0		
10-3037			BLOCK G - ELEVATION 01, G2, G3 & G4	AS	A3	0		
10-3038			BLOCK H - ELEVATION 01, H2, H3 & H4	AS	A3	0		
2000			10-2000	CONDOMINIUM PLANS, ELEVATIONS & SECTIONS	AS	A3	0	
	10-3000		CONDOMINIUM PLANS, ELEVATIONS & SECTIONS	AS	A3	0		
3000	10-3000		CONDOMINIUM PLANS, ELEVATIONS & SECTIONS	AS	A3	0		
	10-3000	CONDOMINIUM PLANS, ELEVATIONS & SECTIONS	AS	A3	0			

INDEX OF DRAWINGS - VOLUME 2	DWG NO	CONTENT	SCALE	SIZE	REV	REMARKS
4000	10-4001	BLOCK A - UPPER BASEMENT 1 & 1ST STOREY PLAN (UPPER DECK)	AS	A3	0	
	10-4002	BLOCK B - UPPER BASEMENT 1ST TO 4TH STOREY PLAN (UPPER DECK)	AS	A3	0	
	10-4003	BLOCK C - 1ST, 2ND TO 4TH STOREY PLAN (UPPER DECK)	AS	A3	0	
	10-4004	BLOCK D - LOWER BASEMENT 1ST TO 4TH STOREY PLAN (LOWER DECK)	AS	A3	0	
	10-4005	BLOCK E - LOWER BASEMENT 1ST & 2ND STOREY PLAN (LOWER DECK)	AS	A3	0	
	10-4006	BLOCK F - LOWER BASEMENT 1 & 1ST STOREY PLAN (LOWER DECK)	AS	A3	0	
	10-4007	BLOCK G - LOWER BASEMENT 1 & 1ST STOREY PLAN (LOWER DECK)	AS	A3	0	
	10-4008	BLOCK H - LOWER BASEMENT 1 & 1ST STOREY PLAN (LOWER DECK)	AS	A3	0	
	10-4009	BLOCK A - SECTION AA, SECTION AB & SECTION AC	AS	A3	0	
	10-4010	BLOCK B - SECTION BA, SECTION BB, SECTION BC & SECTION BD	AS	A3	0	
	10-4011	BLOCK C - SECTION CA & SECTION CB	AS	A3	0	
	10-4012	BLOCK D - SECTION DA & DD	AS	A3	0	
	10-4013	BLOCK E - SECTION EA & EB	AS	A3	0	
	10-4014	BLOCK F - SECTION FA, FB & FC	AS	A3	0	
	10-4015	BLOCK G - SECTION GA, GB & SECTION GC	AS	A3	0	
	10-4016	BLOCK H - SECTION HA, HB & HC	AS	A3	0	
	10-4017	SITE ELEVATIONS - ELEVATION 1 & 2	AS	A3	0	
	10-4018	BLOCK A - ELEVATION 01, A2, A3 & A4	AS	A3	0	
	10-4019	BLOCK B - ELEVATION 01, B2, B3 & B4	AS	A3	0	

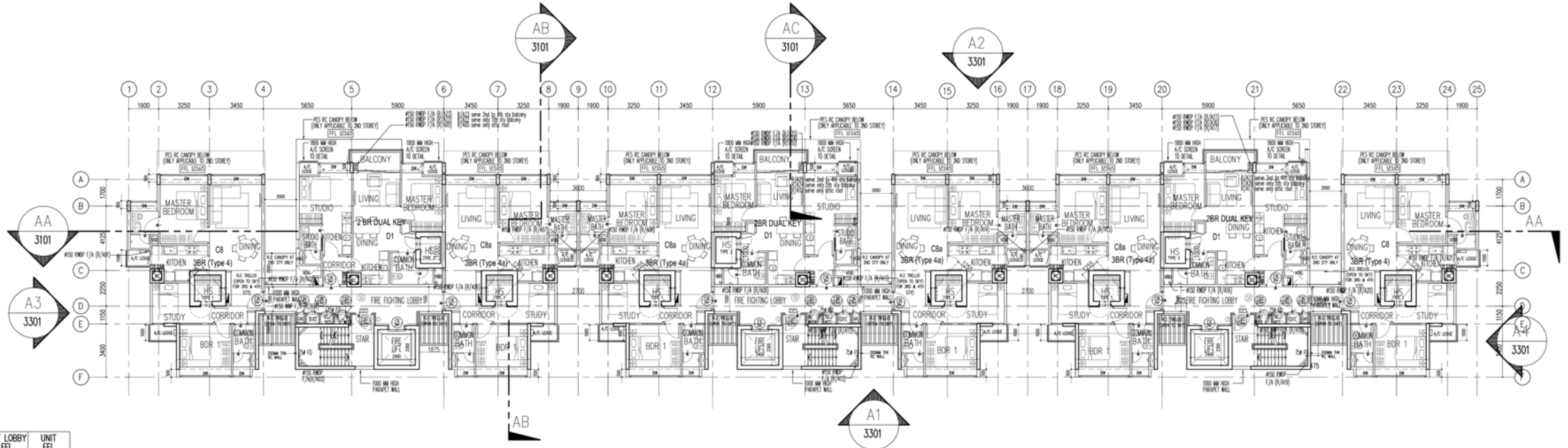
CONSTRUCTION DRAWING	
REV DATE AMENDMENTS	
APPROVALS FUL ESTATES PTE LTD 40B ALLESTREE ROAD #02-00 SINGAPORE 199558 Mr CHEANG KOE KHEONG ARCHITECTS PTE LTD	
1:50 SITE MAP SAA ARCHITECTS PTE LTD 2, RAFFLES PLACE CENTRAL #7-01 SINGAPORE 109606 TEL: 6342 5041 FAX: 6324 9929 MMA Mylke A. C. S. & Associates 2-12-07 Singapore Business Park Office (Singapore) (65) 6742 3000 (65) 6742 3002	
PROJECT MANAGER ARCHITECT STRUCTURAL ENGINEERS MECHANICAL & ELECTRICAL ENGINEERS QUANTITY SURVEYOR LIAISON OFFICER LIAISON ARCHITECT INTERIOR DESIGNER	
PROPOSED ERECTION OF CONDOMINIUM HOUSING DEVELOPMENT COMPRISING 4 BLOCKS (E1, E2, E3 & F) OF 3 STOREY FLATS AND 6 BLOCKS (A, B, C, D, G & H) OF 5 STOREY FLATS (TOTAL 393 UNITS) WITH BASEMENT CARPARKS AND COMMUNAL FACILITIES AT SIGAP ROAD	
DRAWN BY: S.M. 2283 TD-0051	

Boundary lines:

Boundary and setback



Grid



STOREY	LIFT LOBBY FFL	UNIT FFL
2ND STOREY FFL	124.05	124.00
3RD STOREY FFL	127.20	127.25
4TH STOREY FFL	130.35	130.40

BLK A - 2ND TO 4TH STOREY PLAN (UPPER DECK)



Grid



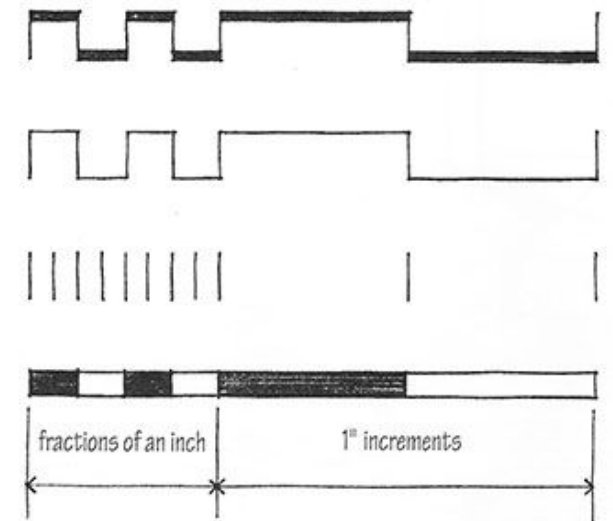
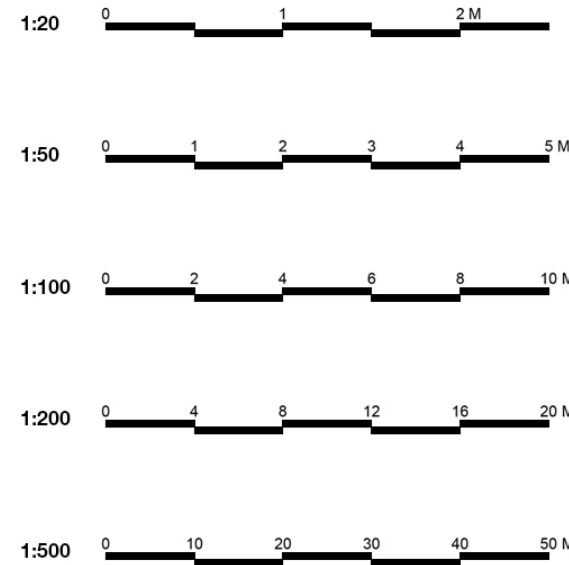
1 BLK A-ELEVATION A1
SCALE 1:200

Scale

Every type of parallel projections is a reduction of a certain ratio to the built reality, which means it is drawn on a particular scale.

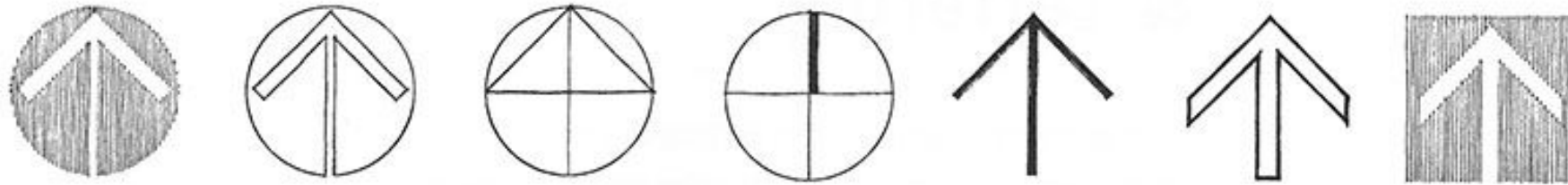
The scale must be marked **on every drawing**, ideally **scale bar** is also included. It is useful if we accidentally print drawings out of scale (for instance printing A3 drawing in A4 paper).

Metric Scale Bars



graphic scales

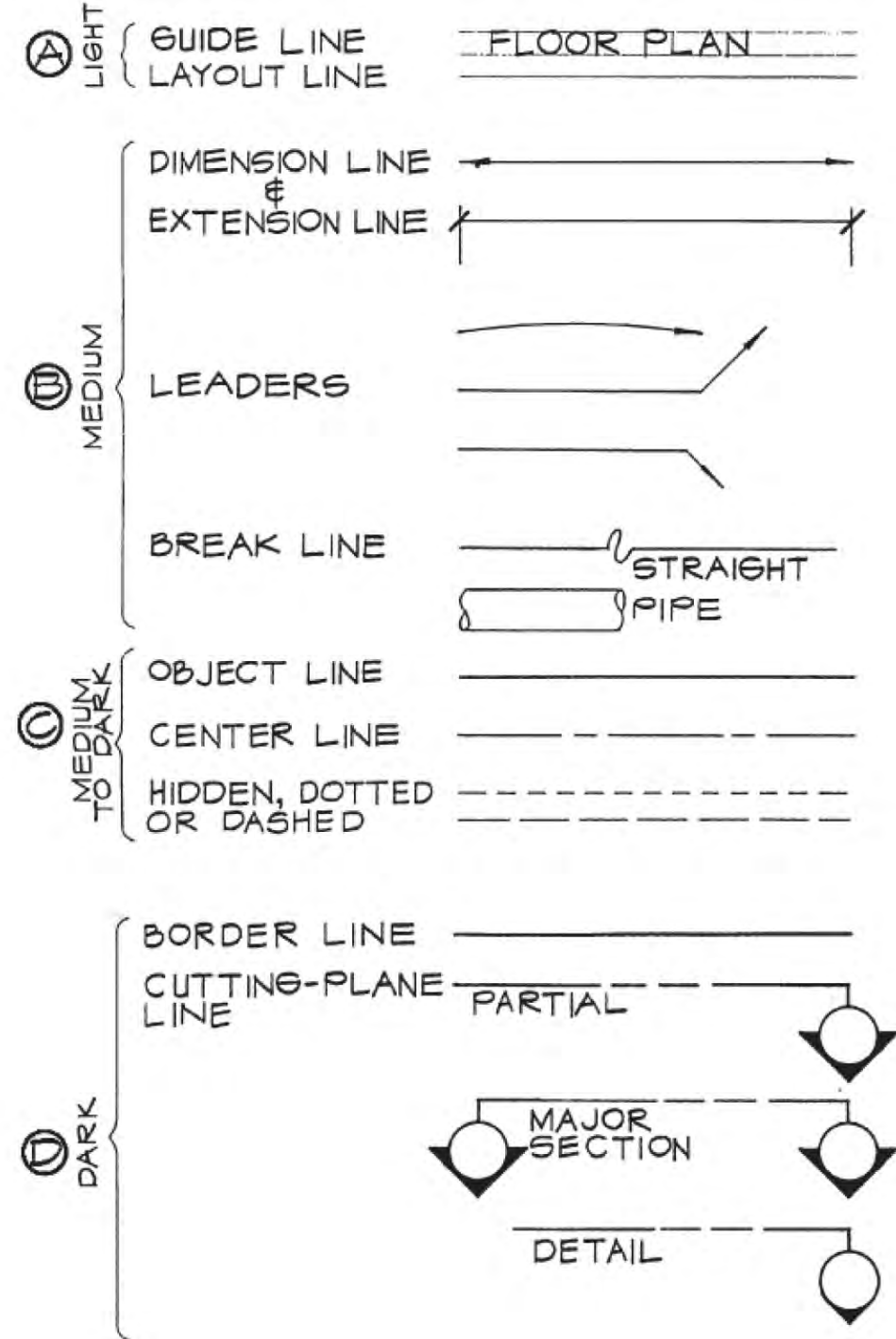
North direction



north arrows

It is useful to the construction team and also for design team, one instance is spatial planning. The **north arrow** is always included in drawings such as: topography plans, site plans and building plans. Typical storey plans usually do not need it.

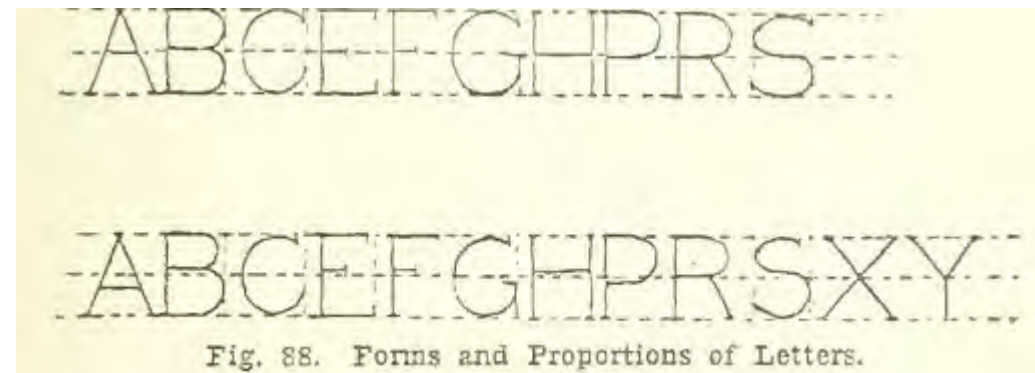
Architectural lines



Wakita, O. A. & Linde, R. M. (2003). *The professional practice of architectural working drawings*, John Wiley & Sons.

Architectural lettering

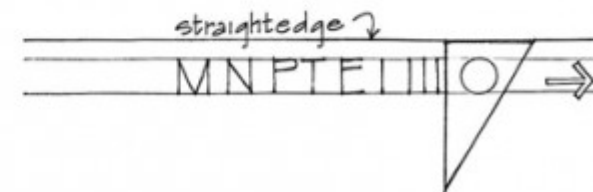
- Master mechanical lettering as part as your drafting skills, often we have to make impromptu manual scaled drawings.
- Uppercase letters
- Maintain consistency



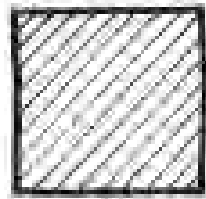
Use of guidelines is mandatory for letters to be consistent in height.

Letters should communicate and not to distract or detract from the drawing itself

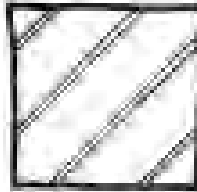
1) Keep lettering vertical
 a small triangle is a quick and efficient way to keep vertical lettering strokes consistently vertical



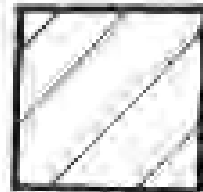
Material hatching



Existing
brickwork



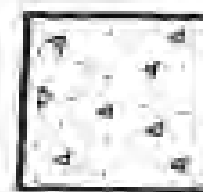
New
brickwork



New
blockwork



Stonework



Concrete



Sawn
softwood



Hardwood



Insulation



Subsoil



Hardcore



Mortar/
screed/
plaster



Plywood



Glass



Steel



Damp proof course
or membrane

Commonly used ones are: new brickwork, concrete, mortar, hardwood, insulation and subsoil.

Dimension

Dimension chains, consist of:

- Dimension line
- Auxiliary dimension line
- Dimension limits
- Dimension figure

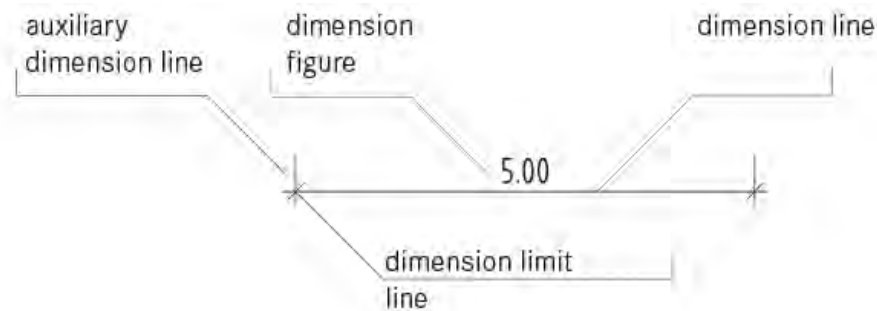


Fig. 16: Elements of a dimension chain

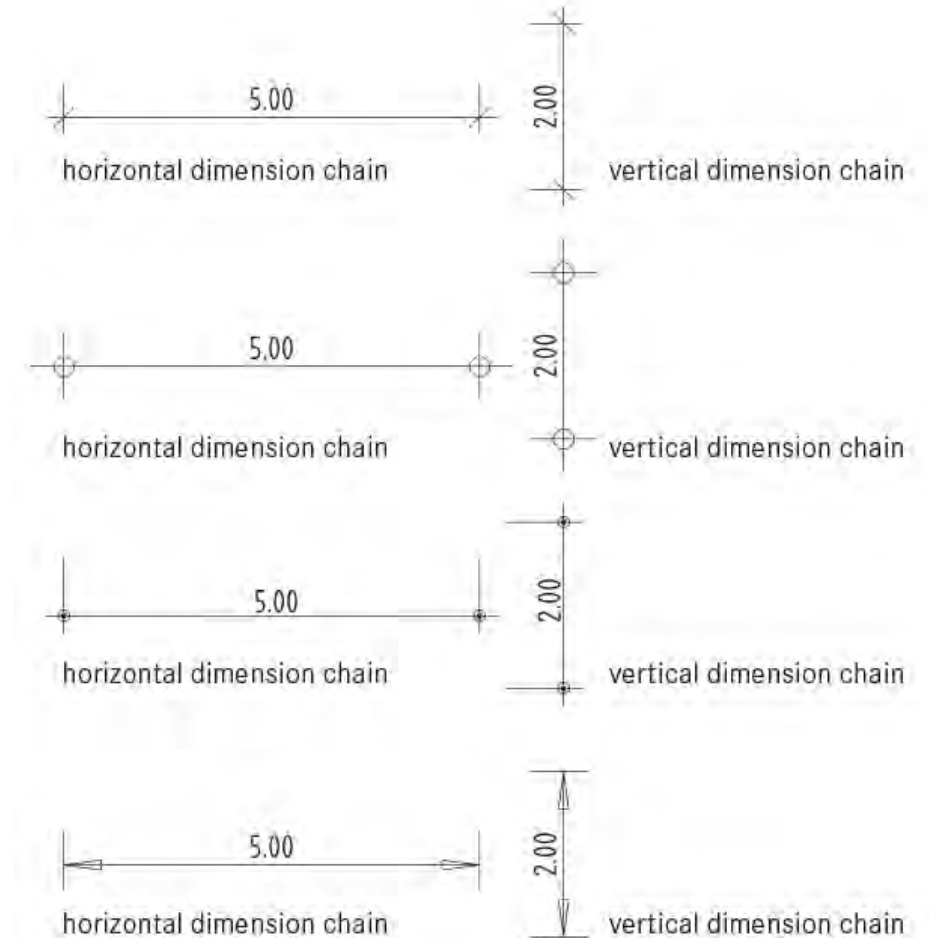
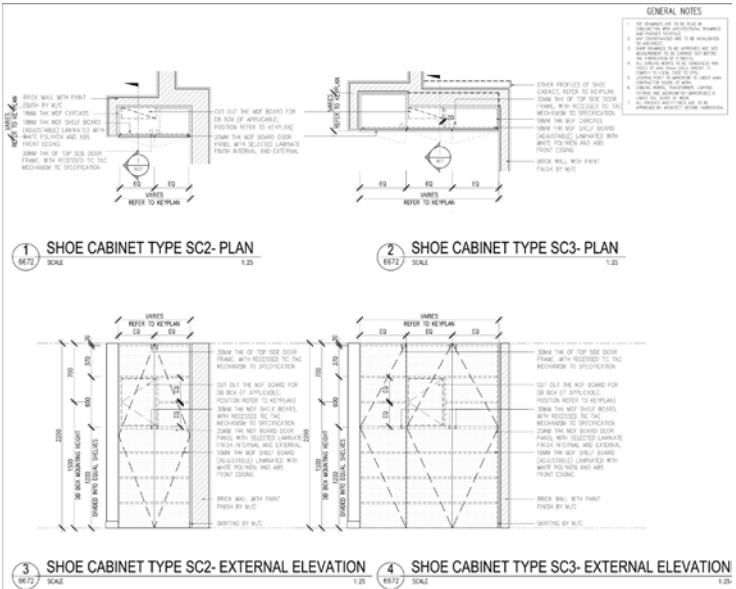
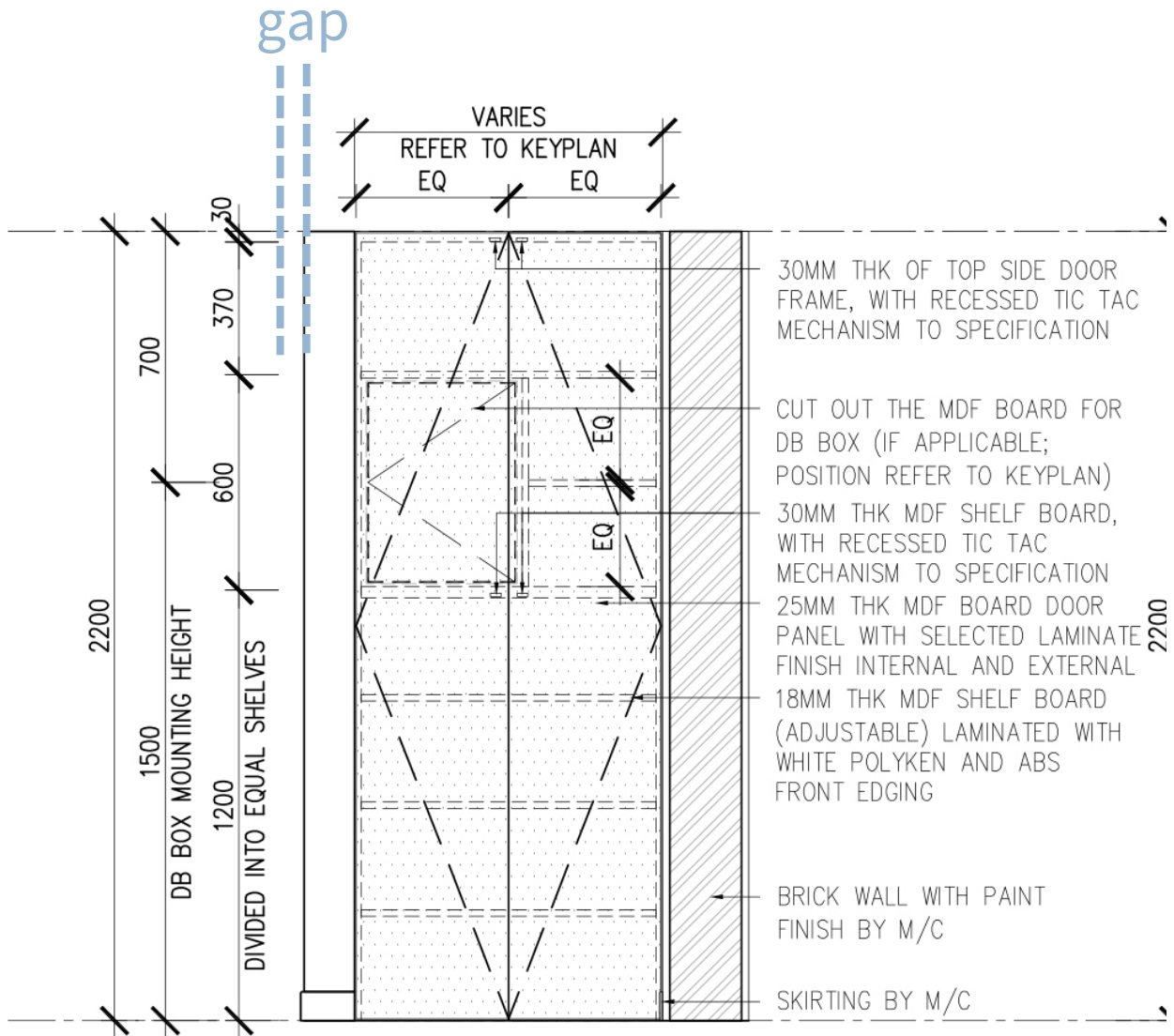


Fig. 17: Example of dimension limits

Dimension



2200

1500 DB BOX MOUNTING HEIGHT

1200 DIVIDED INTO EQUAL SHELVES

700

600

370

30

gap

VARIABLES REFER TO KEYPLAN EQ EQ

30MM THK OF TOP SIDE DOOR FRAME, WITH RECESSED TIC TAC MECHANISM TO SPECIFICATION

CUT OUT THE MDF BOARD FOR DB BOX (IF APPLICABLE; POSITION REFER TO KEYPLAN)

30MM THK MDF SHELF BOARD, WITH RECESSED TIC TAC MECHANISM TO SPECIFICATION

25MM THK MDF BOARD DOOR PANEL WITH SELECTED LAMINATE FINISH INTERNAL AND EXTERNAL

18MM THK MDF SHELF BOARD (ADJUSTABLE) LAMINATED WITH WHITE POLYKEN AND ABS FRONT EDGING

BRICK WALL WITH PAINT FINISH BY M/C

SKIRTING BY M/C



Symbols

Common convention + adaptation

GRAPHIC SYMBOLS		
ABBREVIATION	CEILING SYMBOLS	ARCHITECTURAL ANNOTATION
AC	ACR. CEN.	AREA TAGS
ACE BAL	ACCESS BALCONY	VENTILATION ROOM → FFL → FLOOR FINISH
ADJ	ADJUSTABLE	PLANTER/WATER FEATURE TAGS
AHU	AIR-CEA HANDLING UNIT	TL → TOP LEVEL OF SOIL/WATER
ALUM	ALUMINIUM	BL → BOTTOM/FINISH LEVEL OF SOIL/WATER
AMSL	ABOVE MEAN SEA LEVEL	REFLECTED CEILING
ARCH	ARCHITECTURAL	CH. 0000 → CEILING HEIGHT (CLEAR)
BI	BREEDING INLET	AAA → CEILING FINISH/MATERIAL
CAS	CIVIL & STRUCTURAL ENGINEER	
CDR	CABLE DISTRIBUTION ROOM	
CL	CENTER LINE	
CONC.	CONCRETE	
CSR	CONDENSER SWITCH ROOM	
DB	DISTRIBUTION BOARD ROOM	
DR	DRY RISER	
ELEC	ELECTRICAL	
FHR	FIRE RISER/EL	
GALV	GALVANIZED	
GMC	GAS METER CHAMBER	
GS	GALVANIZED STEEL	
GSV	GAS AND WATER	
HOB	HOUSING & DEVELOPMENT BOARD	
HPC	HANDBAPPED	
LRF	LIFT RISER	
MEP	MECHANICAL, ELECTRICAL AND PLUMBING	
MS	MILD STEEL	
MV	MECHANICAL VENT	
NV	NATURAL VENTILATION	
OP	OUTGOING PIPE	
PC	PRECAST CONCRETE	
P/S	PLUMBING & SANITARY	
PVC	POLYVINYL CHLORIDE	
RC	REINFORCED CONCRETE	
RHS	RECTANGULAR HOLLOW SECTION	
RWD	RAIN WATER OUTLET	
RWJP	RAIN WATER DOWNPIPE	
SCV	SINGAPORE CABLE VESION	
SHS	SQUARE HOLLOW SECTION	
SO	SUPERVISING OFFICER	
SR	SANITARY RISER	
SS	STAINLESS STEEL	
ST	STAIRCASE	
TEL	TELECOM	
VE	VENT EXHAUST	
VS	VENT SUPPLY	
VMC	WATER METER CHAMBER	
WD	WATER OUTLET	
WR	WET RISER	
		AREA TAGS
		VENTILATION ROOM → FFL → FLOOR FINISH
		PLANTER/WATER FEATURE TAGS
		TL → TOP LEVEL OF SOIL/WATER
		BL → BOTTOM/FINISH LEVEL OF SOIL/WATER
		REFLECTED CEILING
		CH. 0000 → CEILING HEIGHT (CLEAR)
		AAA → CEILING FINISH/MATERIAL
		DETAIL NO. — DRAWING NO. INDICATES AREA SHOWN IN DETAIL
		DETAIL NO. — DRAWING NO. INDICATES TARGET SHOWN IN DETAIL
		DETAIL NO. — DRAWING NO. ELEVATION
		DETAIL NO. — DRAWING NO. SECTION
		DOOR NO. — FIRE RATING DOOR SCHEDULE
		LOUVRE NO. — LOUVRE TYPE WINDOWS/ LOUVRES SCHEDULE
		FFL 000.00 → FINISH FLOOR LEVEL/ EXISTING FLOOR LEVEL/ CEILING HEIGHT SHOWN IN ELEVATIONS AND SECTIONS
		EL. 000.00 → CEILING HEIGHT SHOWN IN ELEVATIONS AND SECTIONS
		CH 000.00 → CEILING HEIGHT AS SHOWN ON PLAN
		FFL 000.00 → FLOOR FINISH LEVEL AS SHOWN ON PLAN
		BL 000.00 → BASE LEVEL AS SHOWN ON PLAN
		RL 000.00 → ROAD LEVEL AS SHOWN ON PLAN
		CH 000.00 → CEILING HEIGHT AS SHOWN ON PLAN
		TW 000.00 → TOP OF WALL LEVEL
		PLAN SYMBOLS
		SETTING OUT POINT
		INVERT LEVELS
		SPOT LEVELS
		LAMP POINTS
		PROPOSED INSPECTION CHAMBER
		EXISTING MANHOLE
		PROPOSED MANHOLE
		SANITARY FIXTURES
		WASH BASIN
		MICROB
		FLOOR TRAP
		URINAL
		WATER CLOSET
		TOILET PAPER HOLDER
		TAP POINT
		BATH TUB
		BATH SHOWER MIXER
		TAP
		FLOOR WASTE

ARCHITECTURAL ANNOTATION

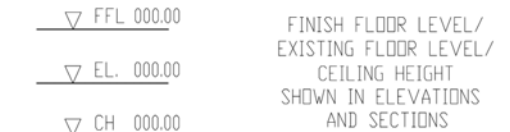
AREA TAGS



PLANTER/WATER FEATURE TAGS

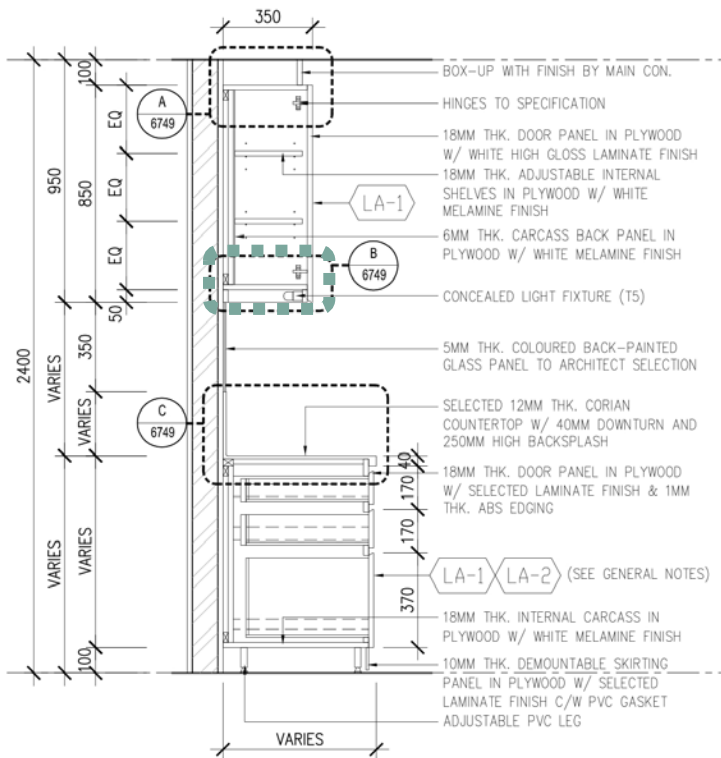


REFLECTED CEILING

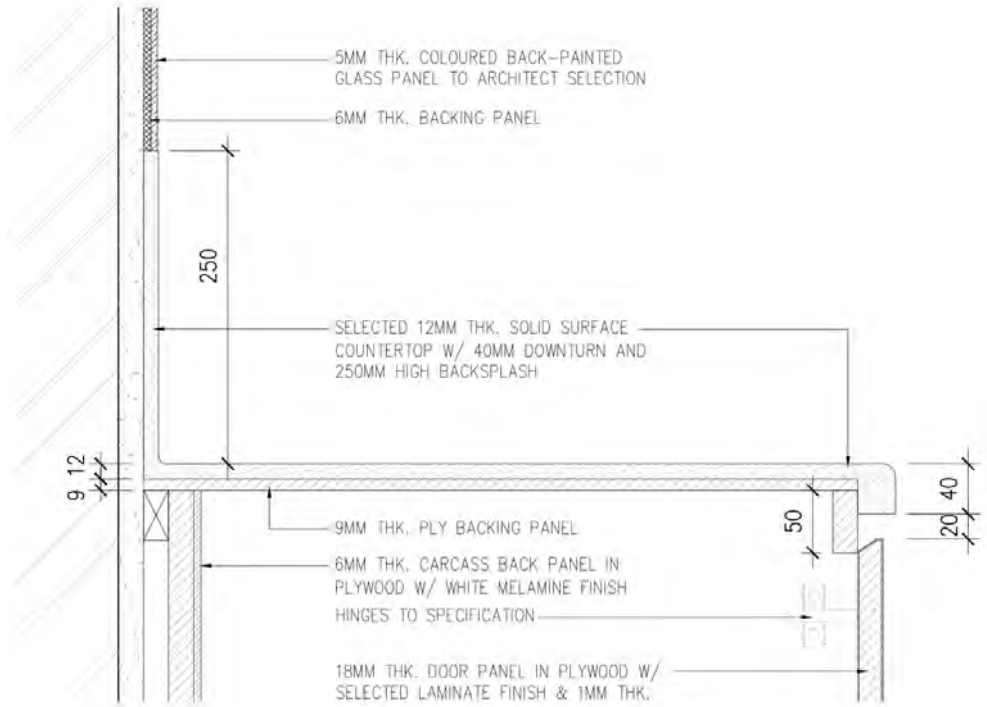


Legibility of drawings

Different types of drawing call for different scale. Legibility needs to be maintained and test prints are recommended.



4 TYPICAL KITCHEN CABINET SECTION
 6742 SCALE 1:20



C DETAIL
 6749 SCALE 1:5



A woman with dark hair, wearing a blue and white striped shirt, is holding a white and black mechanical component. She is looking at a technical drawing on a table. The drawing shows a cross-section of a mechanical assembly with various parts and labels. A man with glasses, wearing a blue and white striped shirt, is also looking at the drawing. The scene is set in a workshop or office environment.

Part 4:

Pre-drawing stage

Manual drawing

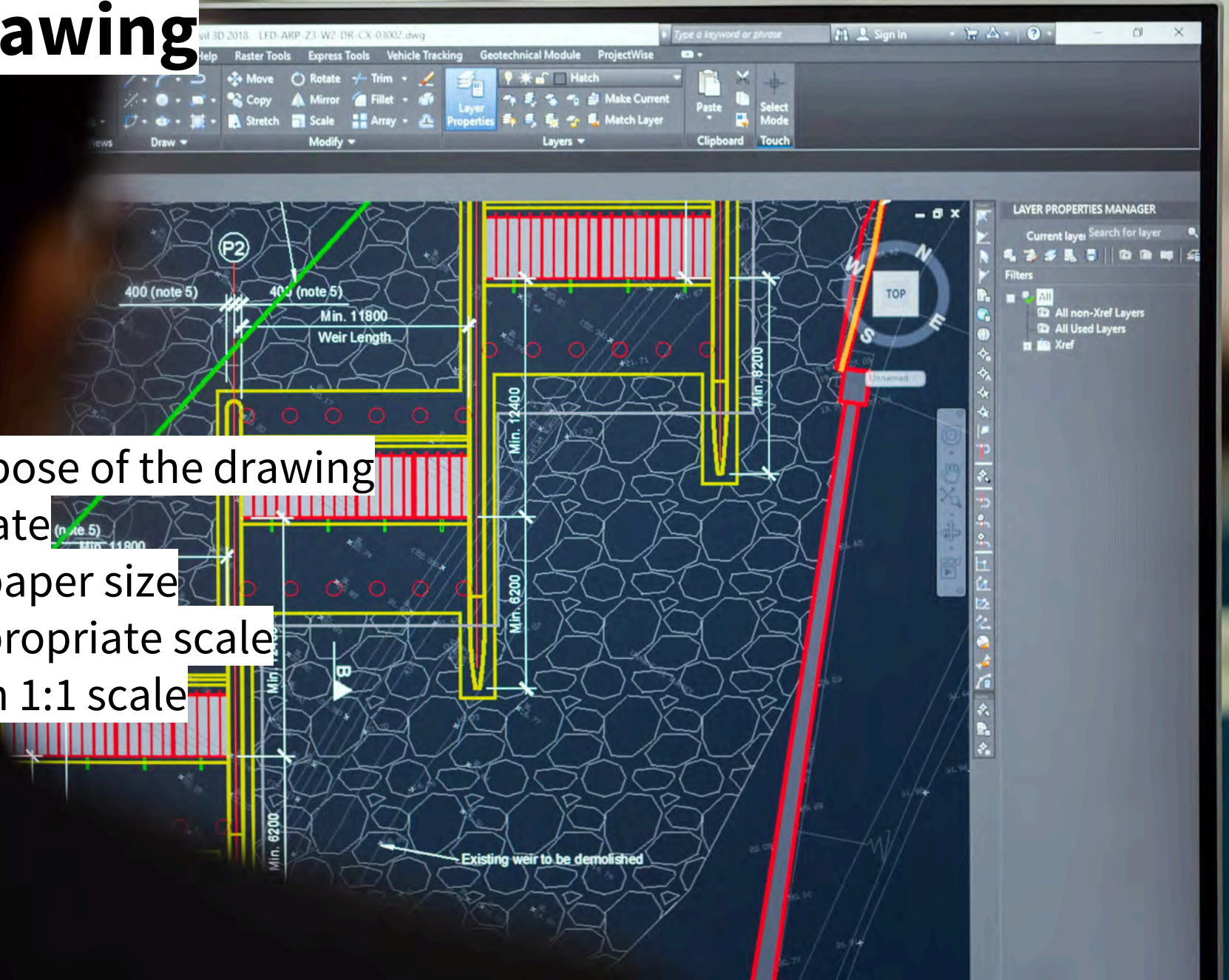


1. Gather the tools
2. Decide the purpose of the drawing
3. Decide on the paper size
4. Test out on an appropriate scale
5. Start drafting in the scale you choose



Digital drawing

1. Decide the purpose of the drawing
2. Create a template
3. Decide on the paper size
4. Test out an appropriate scale
5. Start drafting in 1:1 scale



ACTIVITY 2

Submit via Disqus:

<https://miatedjosaputro.com/2022/04/02/as-week-7/>



SURVEYOR



20 + 45 + 5 mins

DURATION

1. **Measure the building you are currently in.** 20mins
2. **Limit to 2-3 adjacent rooms**
3. **Produce a sketch technical drawing based on your measurements. You can choose manual or digital drafting (AutoCAD, but not SKP).** 45mins
4. **Share: your drawings and personal reflections, via Disqus.** 5mins

Handy tips:

[Measured Survey 101 - How to measure a building with ease \(firstinarchitecture.co.uk\)](#)



**Next week
(Week 8)**

Reading week

There is **no class, so you
can work on your
assignment. I am available
for **tutorials** before your
Assignment 1 submission
in Week 9.**

Please book the slot in advance