

WJEC GCSE IN
BUILT ENVIRONMENT

GUIDANCE FOR TEACHING
UNIT 2 GUIDE (PATHWAY A)



AIMS OF THE GUIDANCE FOR TEACHING

The principal aim of the Guidance for Teaching is to support teachers in the delivery of the WJEC GCSE in Built Environment specification and to offer guidance on the requirements of the qualification and the assessment process. The Guidance for Teaching is not intended as a comprehensive reference, but as support for professional teachers to develop stimulating and exciting courses tailored to the needs and skills of their own students in their particular institutions.

AIMS OF THE UNIT GUIDE

The principal aim of the Unit Guide is to support teaching and learning and act as a companion to the Specification. Each Unit Guide will offer detailed explanation of key points in the Specification and aim to explain complex areas of subject content. An overview of the whole course can be found in the Delivery Guide.

CONTENTS

Introduction	3
Assessment Objectives	3
Other ways that WJEC can offer support:	3
Overview of Unit 2.....	4
Areas of content: Unit 2 (pathway A).....	4
How to read the Specification	5
Explanation of the specification content.....	6
2.2.1a Identifying and calculating information	6
2.2.2a: Writing and setting success criteria	8
2.2.3a: Drawing plans	9
2.2.4a: Drawing elevations.....	11
2.2.5a: Using the language of drafting.....	12
2.2.6a: Drawing two-dimensional plans.....	14
2.2.7a: Creating three-dimensional virtual models and plans	14
2.2.8a: Evaluating design tasks	15
Assessment of Unit 2 (pathway A)	16
FAQs:	16
Glossary for Unit 2	20

INTRODUCTION

The **WJEC GCSE Built Environment** qualification, approved by Qualifications Wales for first teaching from September 2021, is available to:

- all schools and colleges in Wales
- subject to local agreement, it is also available to centres outside Wales, for example in the crown dependencies of the Isle of Man and the Channel Islands, and in British overseas territories, and to British forces schools overseas. It is not available to other overseas centres or in England or Northern Ireland.

It will be awarded for the first time in Summer 2023, using grades A*–G.

ASSESSMENT OBJECTIVES

- AO1** Demonstrate knowledge and understanding of the roles, sectors, concepts and processes within the built environment using relevant terminology.
- AO2** Apply skills, knowledge and understanding of the built environment in a range of contexts.
- AO3** Analyse and evaluate evidence, make reasoned judgements and present conclusions in relation to:
- learners' own products/outcomes
 - the built environment and its impact on people, the economy and the natural environment.

OTHER WAYS THAT WJEC CAN OFFER SUPPORT:

- sample assessment materials and mark schemes
- exemplar materials
- face-to-face CPD events
- examiners' reports on each question paper
- direct access to the subject officer
- free online resources
- Exam Results Analysis
- Online Examination Review.

OVERVIEW OF UNIT 2

Creating the built environment (40% of the qualification)

Overview of the unit

In studying for this unit, learners will develop knowledge and understanding of and skills in creating the built environment. Learners follow one pathway through this unit; either *designing the built environment* or *constructing the built environment*.

Learners should be given the opportunity to develop their knowledge, skills and understanding of either:

- the eight areas of content set out on pages 24 to 30 of the specification for *designing the built environment*, or
- the ten areas of content set out on pages 31 to 40 of the specification for *constructing the built environment*.

AREAS OF CONTENT: UNIT 2 (PATHWAY A)

2.2.1a	Identifying and calculating information
2.2.2a	Writing and setting success criteria
2.2.3a	Drawing plans
2.2.4a	Drawing elevations
2.2.5a	Using the language of drafting
2.2.6a	Drawing two-dimensional plans
2.2.7a	Creating three-dimensional virtual models and plans
2.2.8a	Evaluating design tasks

HOW TO READ THE SPECIFICATION

The subject content is sub-divided into clear and distinct topic areas. Within each topic area the knowledge, understanding and skills are set out with an initial overview and then in two columns. The left-hand column identifies the content to be studied. The right-hand column provides amplification of the knowledge, understanding and skills that learners should develop in this area. Together, these two columns give the full content of the specification. There is no hierarchy implied by the order in which the content is presented, and the order does not imply a prescribed teaching order.

The amplification provided in the right-hand column uses the following four stems:

- 'learners should know' has been used for the recall of facts such as legislation and definitions
- 'learners should know and understand' has been used for the majority of the unit content where knowledge needs to lead to a sense of understanding
- 'learners should be aware of' has been used when the volume of content is quite extensive, and learners do not need to understand all aspects in detail
- 'learners should be able to' has been used when learners need to apply their knowledge to a scenario or practical situation.

The amplification provided in the right-hand column includes all of the accessible content for the relevant section, unless it states, 'e.g.', 'including' or 'such as'. In these cases, the amplification lists relevant content, which should be expanded upon in an appropriate way, taking account of learners' needs and interests.

EXPLANATION OF THE SPECIFICATION CONTENT

2.2.1a Identifying and calculating information	
Content Amplification	Teacher Guidance
	The assessment marking grids in Appendix A of the specification, together with the sample NEA task in Appendix B should be used as a guide to the nature and scope of the work required for this pathway.
<p>(a) Learners should know how to calculate areas to:</p> <ul style="list-style-type: none"> work out quantities of materials required. estimate costs. 	<p>Learners should understand the importance and widespread use of simple floor area calculations, that range from initial building cost estimates, valuations and setting of rental values, to deriving quantities for ordering of materials and assessing project potential, by comparing land cost with possible development size.</p> <p>Learners should know how to calculate areas of standard shapes, including rectangles, triangles, and sectors of a circle.</p>
<p>(b) Learners should know how to calculate volumes to:</p> <ul style="list-style-type: none"> work out quantities of materials required! estimate costs. 	<p>The calculation of the volume of an enclosed space is important in several areas of building design, including setting of levels of insulation, ventilation rates and requirements for space heating.</p> <p>Learners should know how to calculate volumes of rectangular and triangular spaces and on spaces that include sectors of a circle.</p>
<p>(c) Learners should know how to measure distances for design considerations such as:</p> <ul style="list-style-type: none"> evacuation routes boundary clearances spans to estimate structural depths. 	<p>Designs are often based on set distances for requirements such as length of internal evacuation routes, boundary clearances in relation to Building Regulations, distances of separation for privacy considerations relevant to planning control and the initial estimation of structural depths.</p> <p>Learners should be familiar with measuring distances on drawings produced to different scales.</p>
<p>(d) Learners should know how to calculate the effect of changing pitches on spans, volume and quantities of materials such as roof tiles.</p>	<p>Calculation of pitch is relevant when determining volumes of rooms with sloping ceilings volumes and when calculating quantities of roofing materials.</p> <p>Learners should know how to calculate the pitch of sloping surfaces using Pythagoras theorem.</p>

(e) Learners should know how to carry out calculations related to the following high-level design requirements of construction designs:

- area
- ceiling height
- layout of rooms
- outdoor space
- energy use.

The specification suggests a range of high-level design considerations. Learners should be aware the high-level considerations, that may relate to lighting design, provision of acoustic and thermal insulation, and compliance with regulations for the conservation of fuel and power, are carried out using approved software applications.

Learners should know how to carry out preliminary calculations for estimating certain high level considerations, including size of glazed openings for natural lighting and size of opening for adequate ventilation in dwellings.

EXPLANATION OF THE SPECIFICATION CONTENT

2.2.2a: Writing and setting success criteria

Content Amplification	Teacher Guidance
<p>(a) Learners should be aware that project tolerance may involve:</p> <ul style="list-style-type: none"> increase or decrease from planned cost or time. deviations from quality and/or scope. <p>Learners should be aware that construction tolerances may:</p> <ul style="list-style-type: none"> involve allowable variations in terms of: dimensions strength, stability, mix, and performance that are not considered to be defects. 	<p>Project tolerances. Learners should be aware of the distinction between project and construction tolerances.</p> <p>Project tolerances refer to allowances in planned time and cost, usually expressed as contingencies in the project plan.</p> <p>Construction tolerances are the allowable variations in standards of materials and workmanship that are not considered to be defects usually assessed by measurement, or testing.</p>
<p>(b) Learners should understand that a critical success factor for a project is to meet the deadline.</p> <p>Learners should be aware of the following project management techniques designed to help achieve deadlines:</p> <ul style="list-style-type: none"> setting of realistic timescales development of plans and Gantt charts critical path analysis resource allocation setting of milestones use of contingencies. 	<p>The specification emphasises the importance of meeting deadlines and lists a range of project management techniques, that will be available as tools in project management software, that learners should be aware of.</p>
<p>(c) Learners should understand that construction projects are a balance between cost, time and quality.</p> <p>Learners should be aware that in relation to products and materials, quality can be defined by:</p> <ul style="list-style-type: none"> reference to standards specification of attributes nominating suppliers. <p>Learners should be aware that in relation to standard of workmanship, quality can be defined by:</p> <ul style="list-style-type: none"> compliance with manufacturers' requirements reference to a code of practice or standards approval of samples testing and inspection. 	<p>High quality buildings can be produced given a suitable budget and programme, but most construction projects will be a balance between cost, time and quality, with cost being the prime consideration on most commercial projects.</p> <p>Learners should be aware of the importance of quality and that, in addition to the items listed in the amplification, there are British standards for the quality of most building materials and for the quality of workmanship for most trades.</p>

EXPLANATION OF THE SPECIFICATION CONTENT

2.2.3a: Drawing plans	
Content Amplification	Teacher Guidance
<p>(a) Learners should be aware that block plans are drawn to scale and illustrate:</p> <ul style="list-style-type: none"> • location • local infrastructure • site layout, including pedestrian and vehicular access routes, parking and landscaping. <p>Learners should be able to produce accurate block plans using drawing instruments or a Computer Aided Design (CAD) package.</p>	<p>Plans to scale, as listed in part (d), that illustrate:</p> <p>The building in the context of both its site and its location.</p> <p>The layout of the building, including the relationships between rooms, the location of internal fixtures and fittings and the position of any cross sections.</p> <p>It is optional as to whether the drawings produced for assessment are hand drafted or computer generated.</p>
<p>(b) Learners should be aware that floor plans are drawn to scale and illustrate:</p> <ul style="list-style-type: none"> • room layouts • furniture arrangements • horizontal circulation routes • vertical circulation facilities • internal fittings. <p>Learners should be able to produce accurate floor plans.</p> <ul style="list-style-type: none"> • using drawing instruments or a CAD package. 	<p>Sections to scale, as listed in part (d), that illustrate:</p> <p>The vertical arrangement of a building, including internal spaces and structures, and the location of any construction details.</p> <p>It is optional as to whether the drawing(s) produced for assessment are hand drafted or computer generated.</p>
<p>(c) Learners should be aware that cross-sections are drawn to scale and illustrate:</p> <ul style="list-style-type: none"> • floor heights • service voids • vertical circulation routes • structural floor depths • roof structures. <p>Learners should be able to produce accurate cross-sections using drawing instruments or a CAD package.</p>	<p>Sections to scale, as listed in part (d), that illustrate:</p> <p>The vertical arrangement of a building, including internal spaces and structures, and the location of any construction details.</p> <p>It is optional as to whether the drawing(s) produced for assessment are hand drafted or computer generated.</p>

- (d) Learners should be aware that drawings produced to recognised (British Standards) scales as specified in BS 1192 are generally:
- 1:1, 1:5 and 1:10 for construction details
 - 1:50, 1:100, 1:200 for layout and site plans
 - 1:1250 for location plans.

Learners should be able to produce accurate scale drawings using drawing instruments or a CAD package.

EXPLANATION OF THE SPECIFICATION CONTENT

2.2.4a: Drawing elevations	
Content Amplification	Teacher Guidance
<p>(a) Learners should be able to produce accurate 2D representations of wall surfaces to illustrate arrangements such as kitchen units and appliances, and position fixtures, including:</p> <ul style="list-style-type: none"> doors fireplaces windows wall lights electrical outlets and switches <p>using drawing instruments or a CAD package.</p>	<p>Internal and external elevations to scale to illustrate:</p> <p>The position and vertical relationships between the various features, fixtures and fittings listed in the amplification. Learners may wish to consider framing the internal elevation within a sectional drawing of the surrounding building structure.</p> <p>It is optional as to whether the drawing(s) produced for assessment are hand drafted or computer generated.</p>
<p>(b) Learners should be able to produce accurate 2D representations of external wall and roof surfaces including:</p> <ul style="list-style-type: none"> windows doors finishes roof trims and rainwater goods <p>using drawing instruments or a CAD package.</p>	
Learners should be able to produce an external elevation north facing, including details as outlined above.	Smaller scale external building elevations to illustrate the design from each aspect to illustrate:
Learners should be able to produce an external elevation south facing, including details as outlined above.	Building materials and relationships between the main building elements, as listed in the amplification, and including site features, such as adjacent structures, trees, landscaping, vehicles, and pedestrians, all as required to provide context.
Learners should be able to produce an external elevation east facing, including details as outlined above.	Learners may consider producing the elevations at a fixed time so that shadows can be used to add apparent depth and further differentiate orientation.
Learners should be able to produce an external elevation west facing, including details as outlined above.	It is optional as to whether the drawing(s) produced for assessment are hand drafted or computer generated.

EXPLANATION OF THE SPECIFICATION CONTENT

2.2.5a: Using the language of drafting

Content Amplification	Teacher Guidance
<p>(a) Learners should be aware that BS 1992:2007 as updated to BS EN ISO 19650, 2018 is a code of practice for the production, formats and standards of architectural, engineering and construction information used in building information modelling.</p> <p>Learners should be aware that:</p> <ul style="list-style-type: none"> • Building Information Modelling (BIM) is a framework for a collaborative working environment. • in BIM, teams produce and share digital information using standardised processes and agreed standards and methods. 	<p>British Standards (BS) are the standards produced by the British Standards Institute (BSI), which is the national standards body of the UK. They include the code of practice for the production of building / construction information identified in the amplification.</p> <p>Building Information Modelling (BIM), as described in the amplification, is intended to ensure information is reliable and can be used and reused without unauthorised change or need for individual interpretation.</p>
<p>(b) Learners should be aware that:</p> <ul style="list-style-type: none"> • rules about annotation, lines, hatching and use of symbols are standardised throughout the industry. • use of rules (or conventions) reduce drawing time and space needed to convey information. 	
<ul style="list-style-type: none"> • Annotation Learners should be aware of printing and common abbreviations including: <ul style="list-style-type: none"> • FFL (finished floor level) • DRG (drawing) • DIM (dimension). 	<p>Rules and conventions applicable to drafting standardised throughout the industry used to improve drafting efficiency.</p> <p>Learners should be aware of common conventions for annotation, line types and thicknesses, hatching and symbols.</p>
<ul style="list-style-type: none"> • Lines Learners should be aware of the following uses of lines: <ul style="list-style-type: none"> • thick lines for outline of close objects • thin lines for dimensions, hatching and outline of distant. • objects dotted or dashed lines for centre lines or outline of obscured objects. • Hatching Learners should be aware of the use of hatching to show the following in section: <ul style="list-style-type: none"> • brickwork • blockwork • timber • concrete • hardcore. 	<p>Learners will also benefit from an awareness of the benefits of using stencils, for symbols and text, and of adopting a drawing layout, with standardised title block, font styles and sizes.</p> <p>The development of a consistent printed handwriting style for annotations will also improve the quality of hand drafted work.</p>

- | | | |
|---|---|--|
| <ul style="list-style-type: none">• Symbols | <p>Learners should be aware of the use of symbols in construction drawings to reduce drawing time and to show the position and type of specific equipment including:</p> <ul style="list-style-type: none">• sanitary fittings• electrical outlets and switches. | |
|---|---|--|

EXPLANATION OF THE SPECIFICATION CONTENT

2.2.6a: Drawing two-dimensional plans

Content Amplification	Teacher Guidance
<p>(a) Learners should be able to use a CAD package to:</p> <ul style="list-style-type: none"> • develop plans and other design drawings to illustrate building design proposals. • refine concepts and initial design ideas in response to feedback and to illustrate refined building design proposals. • produce technical drawings for use in the construction of building design proposals. 	<p>It is a requirement for learners to use CAD software to produce 2D drawings, that illustrate finished building design proposals and technical details for construction purposes.</p> <p>This should comprise CAD versions of the final drawings produced for sections 2.2.3(a) and 4(a) and illustrate the rules and conventions described in sections 2.2.5(a).</p>

2.2.7a: Creating three-dimensional virtual models and plans

Content Amplification	Teacher Guidance
<p>(a) Learners should be able to use a CAD package to develop 3D models from 2D building design drawings:</p> <ul style="list-style-type: none"> • applying scenes, backgrounds and surroundings to a 3D building model • rendering the external finishes (colour and texture) of a 3D building model • adding features such as images of people, vehicles and landscaping to enhance a 3D building model. • creating 360o views of a 3D building model, including rotation • adding building components, other details and colour to a 3D building model. 	<p>The requirement for the use of CAD software includes the development of the 2D work carried out for section 2.2.6(a) to produce 3D models of proposed designs.</p> <p>The 3D models should be realistic representations of proposed buildings, that have been rendered to illustrate materials, colours and textures and include the features listed in the amplification to provide context.</p> <p>It should be possible to rotate and angle the 3D models so that the design can be viewed from various positions and differing heights.</p>

EXPLANATION OF THE SPECIFICATION CONTENT

2.2.8a: Evaluating design tasks

Content Amplification	Teacher Guidance
<p>(a) Learners should be able to evaluate a finished design task against the project requirements considering:</p> <ul style="list-style-type: none"> ● possible further design improvements ● possible further enhancements in presentation ● areas of the project that were challenging. 	<p>Learners should benefit from developing a standardised approach to evaluating their work, using the three parts of this section of the specification. They should avoid length descriptions of work done and concentrate on a review of quality, successes, and potential improvements.</p>
<p>(b) Learners should be able to evaluate a finished design task against personally-set success criteria considering whether:</p> <ul style="list-style-type: none"> ● all aspects of the task were within the levels of tolerance. ● the task was completed to the set timescale. ● the task was completed to the required quality. 	
<p>(c) Learners should be able to evaluate a finished design task against the needs of end users, considering:</p> <ul style="list-style-type: none"> ● their health and safety ● the intended purpose of the outcome of the design task. 	

ASSESSMENT OF UNIT 2 (PATHWAY A)

Unit 2: Creating the built environment.

Non-exam assessment (NEA): approximately 25 hours
40% of qualification

80 marks: 160 UMS

Unit 2 (pathway A): designing the built environment.

This non-exam assessment (NEA) is composed of a task set by WJEC shown in Appendix B of the specification. WJEC will publish suggested contexts for Unit 2 Pathway A within Appendix B of the specification and refresh it every two examinations series. Learners will have the option of using the context, modifying them, or devising a context of their own.

In Pathway A, *designing the built environment*, learners are required to present their work in an A4 or A3 sized document (or a document made up of a combination of both sizes, e.g., with drawings and plans on A3 paper and the remainder of the task on A4 paper).

It is important that the images are of sufficient quality and quantity to clearly show relevant features/detail of the construction work. Within the task, learners may include short and extended prose, digital images/photographs, annotated images/diagrams to suit the nature of the task. Whilst the form of presentation is flexible, teachers should ensure that learners' work has the potential to address all of the relevant assessment criteria.

The assessment objective weightings for Unit 2 (pathway A) are:

AO1	AO2	AO3
5%	30%	5%
10 marks	60 marks	10 marks

FAQs:

Can learners resit the Unit 2a assessment?

Candidates may resit this unit once only. The better uniform mark score from the two attempts will be used in calculating the final overall qualification grade(s) subject to terminal assessment requirements being satisfied first.

What is the terminal assessment rule?

Candidates must complete 40% of the overall assessment in the series in which they are cashing in. If the assessment being re-taken contributes to the 40% terminal assessment requirement, the mark for the new assessment will count.

What is the entry code for this unit?

English-medium	3509UA
Welsh-medium	3509NA

Is this assessment compulsory?

This assessment is compulsory for learners studying Pathway A of Unit 2.

When can candidates submit the Unit 2a assessment?

Assessment opportunities will be available in May/June each year, until the end of the life of this specification.

Summer 2023 will be the first assessment opportunity for Unit 2a.

Are candidates assessed on their spelling, punctuation and grammar in this assessment?

No.

Will candidates be expected to use content from other units in completing this NEA?

No, however, given the fundamental nature of the unit 1 content, it is likely that learners will use knowledge and understanding gained from unit 1 when completing many of the NEA tasks.

Will the assessment objective weightings remain the same throughout the life of the specification?

Yes.

How is the qualification reported?

GCSE qualifications are reported on an eight-point scale from A*-G, where A* is the highest grade. Results not attaining the minimum standard for the award will be reported as U (unclassified).

Will the tasks remain the same throughout the life of the specification?

Yes.

Do learners have to use the suggested contexts for the NEA tasks?

No.

WJEC will publish suggested contexts for Unit 2 Pathway A within Appendix B of the specification, and refresh both every two examinations series. However, learners will have the option of using these contexts, modifying them, or devising a context of their own.

When should learners complete the Unit 2 (Pathway A) assessment?

There is no set requirement for the completion of this unit, however, it is likely that most centres will look for it to be completed in year 11 (of a typical two-year delivery programme).

Can candidates work together on any part of their NEA?

No. All work completed for assessment must be undertaken on an individual basis.

How long should learners spend on their NEA?

Learners should spend approximately 25 hours on their NEA task for Unit 2a.

Can learners complete their NEA outside of the classroom?

Investigative work may be undertaken outside the supervised time and should not be logged as counting towards the time allocated to the NEA task. However, all work other than investigation must be completed under direct supervision and does count towards the time allocated to the NEA task.

Are there any word or page restrictions for the NEA?

No.

How should learners present their NEA work for submission to WJEC?

Learners are required to present their work in an A4 or A3 sized document (or a document made up of a combination of both sizes, e.g. with drawings and plans on A3 paper and the remainder of the task on A4 paper).

Learners may include short and extended prose, digital images/photographs, annotated images/diagrams to suit the nature of the task and their interests. Whilst the form of presentation is flexible, teachers should ensure that learners' work has the potential to address all of the relevant assessment criteria outlined in the specification.

Can the work be a combination of word processed and handwritten?

Yes.

Can learners use the internet during the completion of their NEA?

During their NEA, the use of resources, including the internet, is not tightly prescribed and candidates may have access to such resources. However, the centre must ensure that:

- there is sufficient supervision of every candidate to enable work to be authenticated
- the work that an individual candidate submits for assessment is their own.

What software packages might learners use when producing their NEA?

A range of software packages are suitable for use within Pathway A of Unit 2, including Autodesk, Revit and 2D Design. Centres have the flexibility to choose the most appropriate software package for their learners.

Can teachers provide guidance about candidates' NEA work?

Teachers can provide 'general advice' and must not provide specific advice about what learners should do to improve their work. Detailed information about what teachers are permitted to advise is provided in section 3.2 of the specification.

Are learners permitted to redraft their work?

Once the task is finished and the final assessment made, no further amendments may be made.

How will assessed work be submitted to WJEC?

Assessment of the work will be sampled by WJEC. Both the sample and the submission details are made available when the internally assessed marks are entered for all candidates in the cohort.

What provisions will be made for learners who might struggle to access the NEA activities such as learners with disabilities or learners who have specific learning needs?

WJEC will follow the guidance and rules on reasonable adjustments found in the Joint Council for Qualifications (JCQ) document: Access Arrangements and Reasonable Adjustments: General and Vocational Qualifications.

We believe that, as a consequence of the provision for reasonable adjustments, very few learners will have a complete barrier to any part of the assessment in GCSE Built

Environment. We recognise, however, that NEA activities can provide challenges for learners with particular disabilities. We will be pleased to respond to queries from centres on an individual basis should they seek advice on delivery or assessment of the qualification for a particular learner or group of learners, and to discuss what reasonable adjustments might be appropriate to remove or minimise the disadvantage experienced by a learner with disabilities studying the GCSE Built Environment qualification.

GLOSSARY FOR UNIT 2

Term	Definition
3D Modelling	The process of using software to create a mathematical representation of a three-dimensional object, such as a building.
BIM Building Information Modelling	An intelligent 3D model-based process that gives construction professionals the tools to collaborate efficiently in the planning, design, constructions and management of buildings and infrastructures.
Building Regulations	<p>Statutory regulations that seek to ensure that the policies set out in legislation relevant to construction work are carried out.</p> <p>Compliance with the regulations should ensure that new buildings and renovation works are going to be safe to use and high-performing.</p> <p>The regulations cover most aspects of construction and are presented as a series of Approved Documents, which describe required standards and methods.</p>
BS Codes of Practice	Produced by the BSI, Codes of Practice recommend good practice as currently undertaken by competent practitioners. They offer reliable indicative benchmarks and are widely used in the construction industry.
BSI British Standards Institute	The national standards body of the UK that produce documents that describe standards required for quality of materials and standards of workmanship.
CAD Computer Aided Design	The computer based technology for design and technical documentation that replaces manual drafting with an automated process.
Hatching Styles	Patterns used on technical drawings to act as symbols for the identification of different types of commonly used materials.