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# GQA LEVEL 5 DIPLOMA IN FAÇADE DESIGN AND ENGINEERING

**Qualification Number**  
**610/5212/7**

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# PERSONAL COMPETENCE SUMMARY

Name	Company/Centre
Job Title	GQA Registration Number

## Mandatory Units

Unit Number	Unit Title	Level	Credit Value	Assessor Signature	Date
L/651/4449	Knowledge of key design principles in facade design and engineering	4	5		
K/651/4457	Knowledge of the types of facades used in buildings	4	5		
A/651/4452	Knowledge of the different facade components and their uses	5	5		
D/651/4453	Knowledge of the different types of materials that can be used on facades	5	6		
J/651/4456	Knowledge of the thermal performance of different facade types	5	5		
F/651/4454	Knowledge of the principles of fire safety in facade design and engineering	5	5		
Y/651/4451	Knowledge of designing to reduce the impact of sound transmission through a facade	4	5		
T/651/4450	Knowledge of the designing process focusing on the structural aspects of the facade	5	5		
H/651/4455	Knowledge of the procurement processes in facade design and engineering	4	5		

RELIABLE EVIDENCE: The forms of evidence available include (mark as appropriate)

Assignment  Invigilated test   
 Professional Discussion



### COMPLETION SIGNATURES

By signing here, the Candidate and Assessor confirm that evidence presented is authentic and that the assessments took place in accordance with the relevant assessment strategy. Details of the assessments and evidence must be recorded in the assessment decision record/summaries at the end of each unit.

	Name and Signature	Date
Candidate		
Lead Assessor		
Internal Verifier		
EQA		

# Introduction to the Qualification

## Who is this Qualification for?

This qualification is aimed at individuals wishing to prove they have the level and range of knowledge to be able to design facades and show they have an understanding of a range of topics that need to be considered in the design process. The qualification covers topics relating to types of facades and the components and materials they are constructed from, thermal performance of different facade types, fire safety relating to facades, sound reduction in facades, the importance of considering the structural aspects of facades and the role of procurement in the design of facades.

This qualification is suitable for those who have the following job roles or are looking to progress into one of them; these roles include:

Facade Engineers, Facade Consultants, Design Managers, Facade Designers, Facade Specialist Contractors, Architects, Project Managers, Estimators, Structural Engineers, Commercial Managers and other roles within the building envelope sector.

This qualification is at Level 5, although some units may be at different levels

## What is required from candidates?

Qualifications are now required to indicate the total qualification time (TQT), this is to show the typical time it will take someone to attain the required skills and knowledge to meet the qualification criteria, this qualification has a TQT of 449 hours.

Qualifications are also required to indicate the number of hours of teaching someone would normally need to receive in order to achieve the qualification. These are referred to as Guided Learning Hours (GLH). The GLH for this qualification is 184.

Mandatory Units			
Unit Number	Unit Title	Level	Credit Value
L/651/4449	Knowledge of key design principles in facade design and engineering	4	5
K/651/4457	Knowledge of the types of facades used in buildings	4	5
A/651/4452	Knowledge of the different facade components and their uses	5	5
D/651/4453	Knowledge of the different types of materials that can be used on facades	5	6
J/651/4456	Knowledge of the thermal performance of different facade types	5	5
F/651/4454	Knowledge of the principles of fire safety in facade design and engineering	5	5
Y/651/4451	Knowledge of designing to reduce the impact of sound transmission through a facade	4	5
T/651/4450	Knowledge of the designing process focusing on the structural aspects of the facade	5	5
H/651/4455	Knowledge of the procurement processes in facade design and engineering	4	5

**Assessment guidance**

Evidence should show that you can complete all the learning outcomes for each unit being taken.

**Types of evidence:**

Evidence of knowledge is required. Evidence of knowledge can be demonstrated through a range of methods including responses to oral and/or written questions, assignments, or professional discussions.

# GQA Qualification Implementation Requirements covering Centre Approval, Candidate Assessment and ongoing Quality Assurance

This document indicates the requirements of Approved Centres delivering GQA qualifications and / or units of credit.

## 1. Equality of Opportunity

Equality of access to fair and valid assessment is necessary for all candidates undergoing assessment. This may mean making reasonable adjustments to normal assessment methods for candidates with particular or special assessment requirements. Candidates work patterns should not become a barrier to assessment, the organisation of which may have to be flexible. In the same way, reasonable adjustment arrangements may be necessary for candidates with a disability. For example, a candidate who is unable, through disability, to produce oral or written evidence, may be allowed to use the method they normally use as a substitute for the required form of communication. Reasonable adjustments need to be approved by GQA.

## 2. Recognised/Approved Assessment Centres

2.1 Individual centres must be approved by GQA to offer specific qualifications and / or units of credit. A centre may be a single organisation or a partnership of two or more organisations. It may operate at a single location or have satellites. For further details see the GQA booklet "Guide to Centre Approval". The Centre Approval process is carried out by a GQA approved EQA. Each Centre must maintain a centre file. It is important to be clear what the steps in the assessment process are:

- plan evidence collection and opportunities for assessment
- collect evidence
- judge evidence
- determine whether sufficient evidence has been presented
- make an assessment decision and give feedback to the candidate

**NB Any deviation from the norm must be approved by a GQA EQA**

### 2.2 Assessors and Verifiers

All Assessors of candidate performance must be competent to make qualitative judgements, both in the skills they are assessing and in the assessment of candidates. Assessor occupational knowledge related to the qualifications being assessed is essential and must be illustrated to GQA prior to approval.

Internal Verifiers are responsible for the quality assurance of the assessment process within a centre. They should have a relevant occupational background and be competent in internal verification. It is recommended that Internal Verifiers work towards national recognition of assessor competence.

EQAs are responsible for ensuring accurate and consistent standards of assessment across centres, qualifications, units of credit and over time. They should have a relevant occupational background, be competent in external quality assurance and hold the relevant national external quality assurance award. GQA will approve and license all individuals involved in the assessment and verification of its approved qualifications and / or units of credit. Individuals who are working towards the Assessor or Internal Verifier national awards can only be provisionally licensed. The judgement of provisional licence holders will need to be agreed/authorised by a fully qualified and GQA licensed individual who cannot carry out a dual role in relation to a specific candidate.

All GQA Assessors and Verifiers must undertake a minimum of 2 significant CPD activities in both occupational areas and assessment and verification. Reflective CPD records must be maintained and made available to GQA EQA's for review.

## 2.3 Centre Approval, Monitoring Reviews and Quality Assurance

The centre recognition/approval process is the start of a significant part of the awarding body's quality assurance system. The Approval process will begin with an EQA review of centre procedures to ascertain the potential centre's ability to deliver GQA qualifications and / or units of credit. Centres will be expected to meet the relevant regulatory authority criteria for delivery of qualifications prior to initial approval; continued compliance with the criteria will be monitored through regular EQA visits. It is recommended that centre reviews are conducted at minimum every six months by a GQA EQA.

New or multi-site centres may be required to undertake quarterly or more frequent EV reviews to ensure that different locations can be seen to satisfy the national requirements.

GQA will ensure that unacceptable barriers relating to the assessment and internal verification of candidates in small companies do not deny recognition of competence to competent young workers. In such circumstances, GQA will demonstrate that its quality assurance procedures remain sufficient and rigorous to ensure that the competence outcomes have standing and credibility in the occupational area.

Enhanced quality procedures to ensure consistency of assessment and verification will be necessary and will include:

- a high level of sampling of assessment decisions N.B. In some instances, the EQA may visit each assessment location and qualification / unit of credit candidate (e.g. single candidates dispersed throughout different small companies on government funded programmes)
- an in-depth scrutiny of assessment plans, materials and records
- specific centre guidance aimed at the successful implementation of qualifications and / or units of credit in SMEs via approved centre partnerships. This can include guidance on the quantity and quality of valid, authentic, and transferable evidence expected to be attributed to individual candidates
- ensuring centres are following the requirements prescribed in any appropriate assessment strategies and applicable
  - codes of practice
- the identification and publication of good practice in centres

## 3. Qualification / Unit of Credit Candidates

All candidates must register with a GQA recognised/approved centre. The centre must maintain appropriate candidate personal details for external audit purposes etc.

The centre will provide candidates with advice and guidance on how to prepare for assessment and allocate an Assessor who will assess the candidate's ability to meet the requirements of the relevant qualifications / unit of credit.

## 4. Evidence

A qualification and / or credit is awarded when a person has achieved the necessary outcomes of the qualification and / or unit of credit.

The specific combination of units necessary to achieve a qualification is detailed in the qualification structure. Certificates of Unit Credit can be awarded when candidates achieve any one or more units from the qualification.

The evidence the candidate brings forward is primarily evidence of performance of what he/she can do, not just what he/she knows. The assessment criteria / qualification requirements are described within the qualification and / or unit of credit itself and can incorporate practical skills and knowledge.

The assessor's role is to judge each relevant item of evidence. Each must be judged against the qualification and / or unit of credit requirements. It is not sensible to collect evidence against individual criteria. Nor is it effective. If items of evidence were collected for each of the criteria, the candidate may have to produce many items of evidence, well above the number required.

When judging each item of evidence, the assessor is deciding whether the evidence:

- is authentic – i.e. actually produced by the candidate
- meets the criteria
- relates as appropriate to a context defined within the qualification and / or unit of credit
- confirms that the candidate has the required underpinning knowledge

When the assessor makes a decision about the candidate's knowledge, he or she examines all the evidence available to determine:

- if the evidence, as a whole, covers all the evidence of achievement
- whether there is enough evidence on which to make a decision. The answer can only be:
  - yes
  - no
- there is insufficient evidence to make a decision

### Knowledge evidence

Being able to achieve a standard requires the ability to put knowledge to work. The qualification and / or unit of credit indicates the knowledge each person should use if they are to perform competently.

It should not be necessary to test all of the candidate's knowledge separately; however, any exception to this would be detailed in the relevant Assessment Strategy. Performance evidence could show that the candidate knows what he or she is doing. When this is not the case, or if the assessor is not convinced from the performance evidence, it may be necessary to check the individual's knowledge separately.

Oral or written assessments must clearly provide a suitable means of checking the breadth and depth of an individual's knowledge. Assessors will need to judge the best mix of knowledge evidence according to individual circumstances. Knowledge evidence is useful when deciding the quality of performance evidence, but must not be used in isolation to judge competence or as an alternative to performance evidence. Care must be taken that candidate evidence is auditable and verifiable.

**NB: These Qualification implementation guidelines are generic across the full range of GQA qualifications. Further guidance on acceptable evidence on each qualification will be found in the Introduction to the Qualification section of the candidate booklet**

# Candidate Declaration

Candidate Name.....

Centre/Company Name.....

Assessor(s) Name(s).....

I acknowledge receipt of this copy of GQA qualification booklet. The unit structure provides information on which units must be achieved to be awarded the qualification. The individual units detail the necessary requirements etc that I must achieve.

I understand that I will have an important role in preparing for and planning assessments and with guidance from the Assessor I will collect and record relevant evidence.

I have been informed of the appeals system, should I want to appeal against any part of the assessment process.

I understand the assessments will be carried out with regard to the company's/centre's Equal Opportunities Policy.

Candidate signature.....

Date.....

## Knowledge of key design principles in façade design and engineering

GQA Ref	FDE01	Regulatory Ref	L/651/4449	Level	4	Credit Value	5
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### Aims

The aim of the unit is to show the learner has an awareness of the design principles that need to be followed when designing facades. The unit covers the following aspects of design principles that the candidate will need to be aware of in their role: codes of practice relating to facades, safety considerations for during the build and for ongoing maintenance. Cost considerations, the efficiency and comfort provided by the completed building and the considerations of how the project is to be built and the practicalities relating to this.

### Assessment Guidance

This unit will be assessed through the learner producing a portfolio of evidence, the evidence required for this unit will be:

- Completing the online multiple choice question test
- Completing the end of unit assignment
- Professional Discussion with the assessor

Assessors for this unit must have verifiable, current industry experience and sufficient depth of relevant occupational expertise and knowledge and must use a combination of assessment methods as defined by GQA Qualifications in the qualification guidance notes.

Learning outcome; The learner will:	Evidence Ref No.		
	1	2	3
1. Know the importance in the role of standardisation and utilising baseline performance in the design of facades			
2. Know the Approved Documents of the Building Regulations that apply to facades and the areas they focus on			
3. Know the main reasons why facades need to comply with the Approved Documents and which Building Control bodies can uphold and assess the compliance of a façade to meet these standards			
4. Know the standards that might need to be applied to the design of a façade to include: <ul style="list-style-type: none"> <li>a) BREAM</li> <li>b) Warranty providers (NHBC and LABC Standards)</li> <li>c) CWCT Standards and Technical Notes</li> <li>d) CIRIA</li> <li>e) International standards</li> </ul>			

<p>5. Know the performance standards that might need to be considered during the façade design and engineering process</p>			
<p>6. Know the aspects of health and safety that need to be considered in the design of the façade to include:</p> <ul style="list-style-type: none"> <li>a) Fire safety</li> <li>b) Use of different types of safety glass</li> <li>c) Safety in relation to balconies on facades</li> <li>d) Safety in relation to window types and openings</li> <li>e) Reduction of mould growth in interstitial spaces</li> <li>f) Health risks to be considered and dealt with at the façade design stage</li> <li>g) Other safety considerations at the facade design stage</li> </ul>			
<p>7. Know how cost needs to be considered and controlled at the design stage of the façade to consider the following:</p> <ul style="list-style-type: none"> <li>a) The impact of cost on the design process</li> <li>b) Cost considerations on the design process</li> <li>c) Costs related to the ongoing maintenance of a façade</li> <li>d) Costs to consider for the developer during the build and client after the build</li> <li>e) Costs related to bespoke designs and the use of value engineering to reduce associated costs</li> <li>f) Costs relating to specific projects</li> </ul>			
<p>8. Know the reasons for considering the efficiency and comfort of the building at the façade design stage, to include:</p> <ul style="list-style-type: none"> <li>a) Thermal performance of the façade</li> <li>b) Acoustic performance of the façade</li> <li>c) Daylight requirements</li> <li>d) Solar shading</li> <li>e) Ease of operation of opening parts of the façade</li> <li>f) Designing to comply with relevant regulations relating to efficiency and comfort</li> </ul>			
<p>9. Know the reasons for the need to consider the buildability of the façade design and the practicability of turning the design into a building, to include:</p> <ul style="list-style-type: none"> <li>a) Potential dangers to consider relating to the building of the façade</li> <li>b) Factors to consider relating to the practicality of the design of the facades and attachments</li> </ul>			

<p>c) How the buildability and practicality of the structure has an impact on the costs of the build</p> <p>d) How to consider the security aspects of the designed structure</p> <p>e) Awareness of best practice details in relation to the buildability and practicality of the design of the façade.</p>			
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**Assessor Comments/Feedback**

### Knowledge of types of façades used in buildings

GQA Ref	FDE02	Regulatory Ref	K/651/4457	Level	4	Credit Value	5
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#### Aims

The aim of the unit is to show the learner the different types of facades that can be fixed to the building, what their uses are and how they are constructed. The unit will give the candidate an awareness of the following types of facades and points to consider around these types: rainscreen, masonry, precast concrete, curtain walling, insulated render, sandwich panels and sealed facades as well as other types of facades as well.

#### Assessment Guidance

This unit will be assessed through the learner producing a portfolio of evidence, the evidence required for this unit, will be:

- Completing the online multiple choice question test
- Completing the end of unit assignment
- Professional Discussion with the assessor

Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge and must use a combination of assessment methods as defined by GQA Qualifications in the qualification guidance notes.

Learning outcome; The learner will:	Evidence Ref No.		
	1	2	3
<p>1. Know the types and uses of ventilated rainscreen façade assemblies that can be used as a façade on a building, to include:</p> <ul style="list-style-type: none"> <li>f) Standards and regulations relating to rainscreen</li> <li>g) Components used in rainscreen construction</li> <li>h) How rainscreen is ventilated and pressure equalised drainage</li> <li>i) Fire safety requirements and materials used</li> <li>j) Rainscreen cavity parameters</li> <li>k) Joints used in rainscreen and how they work</li> <li>l) Rainscreen fixings and brackets used</li> <li>m) Common rainscreen coordinated details and their uses</li> <li>n) How insulation is used in rainscreen and suitable insulation material allowed</li> </ul>			
<p>2. Know how masonry façade systems can be used on a building, the types available and their uses, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. Types of masonry facades</li> <li>b. The components that make up a masonry façade</li> <li>c. Types of masonry façade materials</li> <li>d. How dead load and lateral / wind load is transferred through the system</li> <li>e. How the system is fixed to the structure, including different bracket types and fixings</li> <li>f. Types of insulation used, what type and where they can be used</li> <li>g. Size of cavity gaps and why they are important</li> <li>h. Different masonry facades support strategies</li> <li>i. How the system is drained and use of cavity trays and damp proof courses</li> </ul>			

<p>3. Know how pre-cast concrete is used as a type of façade on a building, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. What pre-cast concrete panels are and how they are used on a façade</li> <li>b. How precast concrete panels are fabricated and the benefits of this method</li> <li>c. The features and benefits of using pre-cast concrete as a façade material</li> <li>d. The materials used to make a pre-cast concrete panel and overall façade</li> <li>e. How pre-cast panels are fixed to the structure</li> <li>f. How to join the pre-cast panels together</li> <li>g. How to seal and drain the system</li> </ul>			
<p>4. Know the types and use of curtain wall systems as a façade finish on a building, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. An accurate definition of curtain walling</li> <li>b. Types of curtain walling available and the factors that influence choice of system to use</li> <li>c. The profiles used in a curtain walling system and sizes available</li> <li>d. How curtain walling profiles are extruded</li> <li>e. How a curtain wall system is fixed to the structure and the types of brackets used</li> <li>f. The different loads that can be applied to a curtain walling system</li> <li>g. Curtain walling system components and their uses</li> <li>h. The “Build-Up” of the curtain walling system</li> <li>i. Window and door inserts that can be used in curtain walling</li> <li>j. How loads are distributed through the system</li> </ul>			
<p>5. Know how insulated render is used as a type of façade on a building, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. Features and uses of an insulated rendered façade system</li> <li>b. The make-up of an insulated rendered façade and individual panels</li> <li>c. How the system is drained</li> <li>d. Fire rating and fire protection in an insulated rendered façade</li> <li>e. Fixing an insulated rendered panel to the structure</li> <li>f. Accommodation of movement in insulated render facades. Key principals of movement joint layout.</li> <li>g. How to design to avoid staining on the face of the façade</li> </ul>			
<p>6. Know how sandwich panels and sealed facades are used on a building, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. Key properties, features and uses of sandwich panels</li> <li>b. The components and make up of a sandwich panel</li> <li>c. Different types and sizes of panels available</li> <li>d. How the panels are fixed back to the structure</li> </ul>			
<p>7. Know types, features and use of the other lesser-known types of facades that can be used as a façade on a building, including:</p> <ul style="list-style-type: none"> <li>a. Living green walls</li> <li>b. ETFE systems</li> <li>c. 3D printed facades</li> <li>d. Profiled glass</li> <li>e. Double leaf facades</li> </ul>			

<p><b><u>Assessor Comments/Feedback</u></b></p>
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**Knowledge of the different façade components and their uses.**

<b>GQA Ref</b>	<b>FDE03</b>	<b>Regulatory Ref</b>	A/651/4452	<b>Level</b>	5	<b>Credit Value</b>	5
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**Aims**

The aim of the unit is to show the learner that a façade is made up of a number of different parts that can be added to the façade so that it provides a façade with the appropriate functions that are relevant for the type of building it is being fixed to. The unit will look at the following parts of a façade and explain how they are used: walls, windows, doors, balconies and balustrades

**Assessment Guidance**

This unit will be assessed through the learner producing a portfolio of evidence, the evidence required for this unit will be:

- Completing the online multiple choice question test
- Completing the end of unit assignment
- Professional Discussion with the assessor

Assessors for this unit must have verifiable, current industry experience and sufficient depth of relevant occupational expertise and knowledge and must use a combination of assessment methods as defined by GQA Qualifications in the qualification guidance notes.

<b>Learning outcome; The learner will:</b>	<b>Evidence Ref No.</b>		
	<b>1</b>	<b>2</b>	<b>3</b>
<p>1 Know how walls are used on a façade and how they are made up, to include an understanding of:</p> <ul style="list-style-type: none"> <li>f. The definition of vision and non-vision walls</li> <li>g. The Construction methods and façade types covering, traditional brick, pre-cast panels and brick veneers</li> <li>h. The performance parameters and methods of measurement of vision and non-vision walls covering:                             <ul style="list-style-type: none"> <li>i. energy</li> <li>ii. acoustics</li> <li>iii. light transmittance</li> </ul> </li> <li>i. Architectural drawings showing vision and non-vision walls</li> <li>j. Who needs to be aware of non-performance and performance of system</li> <li>k. Build-up insulation and thermal performance</li> <li>l. Façade build up for different systems</li> <li>m. Measuring air tightness and air permeability of wall types</li> <li>n. Benefits and performance of prefabricated and in-situ assemblies</li> <li>o. Acoustic performance of walls</li> </ul>			
<p>2. Know how windows are used in the façade of a building, and key parts of windows, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. Key components of a window</li> <li>b. Difference between windows and “all-glass” curtain walling</li> <li>c. The different materials windows can be made from and their features, benefits, drawbacks and uses, to include:                             <ul style="list-style-type: none"> <li>i. PVCu</li> <li>ii. Timber</li> </ul> </li> </ul>			

<ul style="list-style-type: none"> <li>iii. Aluminium</li> <li>iv. Steel</li> <li>v. Composite</li> <li>d. The different window opening types and their uses in a façade and how to identify them on architect drawings</li> <li>e. The window performance parameters and standards to apply covering: <ul style="list-style-type: none"> <li>i. U- values</li> <li>ii. Acoustics</li> </ul> </li> <li>f. Air tightness</li> </ul>			
<p>3. Know how doors form part of a façade, and how they are used in facades within set parameters, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. Door types and uses on a façade, for the following areas: <ul style="list-style-type: none"> <li>i. Low traffic</li> <li>ii. High traffic</li> <li>iii. Revolving doors</li> <li>iv. Materiality</li> </ul> </li> <li>b. Materials used to construct doors and their uses, including: <ul style="list-style-type: none"> <li>i. PVCu</li> <li>ii. Aluminium</li> <li>iii. Steel</li> <li>iv. Composite</li> </ul> </li> <li>c. The required performance parameters and standards for doors relating to: <ul style="list-style-type: none"> <li>i. Thermal properties</li> <li>ii. Acoustics</li> <li>iii. Air permeability</li> <li>iv. Security</li> </ul> </li> <li>d. Robustness and service life</li> </ul>			
<p>4. Know how balconies are used on a façade and how they are constructed and design parameters, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. Standards and regulations relating to balcony design and use</li> <li>b. The accurate definition of a balcony</li> <li>c. Types of balconies and their uses</li> <li>d. Balcony construction types and materials used to cover: <ul style="list-style-type: none"> <li>i. Prefabricated</li> <li>ii. In situ construction</li> </ul> </li> <li>e. Materials used in balconies and where they are used</li> <li>f. Fire safety considerations in balcony design</li> <li>g. Main types of drainage used on balconies and where they are used</li> <li>h. Structural performance of balconies and deflection considerations</li> <li>i. Types of flooring used on balconies, how they are fixed, and slip resistance</li> <li>j. Use of thermal breaks between the balcony and the structure</li> </ul>			
<p>5. Know how balustrades are used on facades, design parameters and materials used in balustrades, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. What balustrades are and why are they needed</li> <li>b. Design and safety considerations relating to balustrades, to include: <ul style="list-style-type: none"> <li>i. Assessment of risk</li> <li>ii. Preventative measures to reduce identified risks</li> </ul> </li> <li>c. Materials used to construct balustrades, their uses and restrictions</li> <li>d. Regulations and standards relating to the use of balustrades</li> <li>e. Parameters to consider when designing balustrades</li> <li>f. The difference between vision and non-vision balustrades</li> </ul>			

g. The use of Juliette guarding as balustrading			
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**Assessor Comments/Feedback**

## Knowledge of the different types of materials that can be used on facades

GQA Ref	FDE04	Regulatory Ref	D/651/4453	Level	5	Credit Value	6
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### Aims

The aim of the unit is to show the learner that facades can be made from a range of different materials including: glass, stone, brick, concrete, ceramics, metal, timber and also consider the types of insulation used. They will need to be aware of the limitations each of the materials have and where they can be used. They need to know some of the issues that can be attached to their uses and the main features and benefits of each type of materials. They also need to know when the materials are used in the same façade how they interact with each other and the effects this might have on the overall façade performance. They also need to know how each type of material is fixed to the structure and how this might have an impact on the building.

### Assessment Guidance

This unit will be assessed through the learner producing a portfolio of evidence, the evidence required for this unit, will be:

- Completing the online multiple choice question test
- Completing the end of unit assignment
- Professional Discussion with the assessor

Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge and must use a combination of assessment methods as defined by GQA Qualifications in the qualification guidance notes.

Learning outcome; The learner will:	Evidence Ref No.		
	1	2	3
<p>1. Know the types, uses and performance parameters of glass used in facades, to include an understanding of :</p> <ul style="list-style-type: none"> <li>p. Glass types, their uses and performance parameters, including:                             <ul style="list-style-type: none"> <li>i. Annealed</li> <li>ii. Heat strengthened</li> <li>iii. Tempered / toughened glass</li> <li>iv. Laminated glass</li> <li>v. Monolithic</li> </ul> </li> <li>q. How glass is used on facades and its purpose</li> <li>r. How different glass breaks and the hazards or safety features associated with each type</li> <li>s. How glass thickness has an impact on pane size, its uses and performance parameters</li> <li>t. The causes of thermal shock breakage and how the risk of thermal shock can be reduced</li> <li>u. What is covered in a thermal stress analysis report</li> <li>v. Components and properties of an Insulated Glass Unit (IGU)</li> <li>w. What Low E glass is and how it impacts the performance of an IGU</li> </ul>			
<p>2. Know how stone is used on a façade, its limitations and parameters for use including an understanding of:</p> <ul style="list-style-type: none"> <li>a. How stone panels are used on a façade</li> <li>b. Parameters and uses of the following stone veneer fixing methods                             <ul style="list-style-type: none"> <li>i. Visible mechanical</li> <li>ii. Undercut anchor</li> <li>iii. Kerf or edge groove fixings</li> </ul> </li> </ul>			

<ul style="list-style-type: none"> <li>iv. Composite stone bonding</li> <li>c. How fire safety and fire spread needs to be considered and reduced when using stone panels</li> <li>d. Pre-cast stone panels, what they are and how they are used on a facade</li> <li>e. Types of support brackets used to fix stone panels to the structure</li> <li>f. Types of joints used between panels their benefits and drawbacks</li> <li>g. Different properties of stone panel and their uses and issues, covering <ul style="list-style-type: none"> <li>i. Stone porosity</li> <li>ii. Thermal properties</li> <li>iii. Acoustic properties</li> </ul> </li> <li>h. Benefits and drawbacks of pre-assembled and site assembled stone panels</li> <li>i. Common applications of stone panels on a façade</li> </ul>			
<p>3. Know how bricks are used on a façade, their types and parameters for use including an understanding of:</p> <ul style="list-style-type: none"> <li>a. Types and sizes of standard bricks</li> <li>b. Different types of brick bonds and where they are used</li> <li>c. How brick sizes impact the sizes of window and door openings</li> <li>d. Properties or bricks, their performance and inherent issues, covering <ul style="list-style-type: none"> <li>i. Porosity</li> <li>ii. Material type</li> <li>iii. Method of construction</li> </ul> </li> <li>e. How bricks are used on rainscreen facades and types of brackets used</li> <li>f. How loads placed on the brick panels are dealt with</li> <li>g. How bricks ties and channels are incorporated into a brick façade</li> <li>h. The differences and benefits of brick slips and precast concrete including how they are manufactured</li> <li>i. The need for lintels to be used over window and door openings</li> </ul>			
<p>4. Know how concrete is used in facades and its parameters and construction methods, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. Properties of concrete to include: <ul style="list-style-type: none"> <li>i. Thermal performance</li> <li>ii. Acoustic performance</li> </ul> </li> <li>b. Types and uses of different types of panels and concrete including limitations and drawbacks to cover: <ul style="list-style-type: none"> <li>i. Sandwich concrete panels</li> <li>ii. Architectural columns and beams</li> <li>iii. Glass Fibre Reinforced Concrete (GFRC)</li> <li>iv. Ultra-High Performance Concrete (UHPC)</li> </ul> </li> <li>c. Sizes and thicknesses of concrete panels</li> <li>d. How concrete panels are fixed to the structure</li> </ul>			
<p>5. Know how ceramic can be used on a façade, its limitations and construction methods, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. Properties of ceramic as a façade and its main applications</li> <li>b. Advantages and disadvantages of using ceramic</li> <li>c. Issues to consider and how they impact on the façade design to cover: <ul style="list-style-type: none"> <li>i. Size restrictions</li> <li>ii. Standard tile size</li> <li>iii. Issues with ceramics as a material</li> </ul> </li> <li>d. The difference between using ceramic on low rise buildings and high rise buildings</li> <li>e. Fire safety issues to consider for ceramic facades</li> <li>f. Safety issues relating to tiles breaking and how they are overcome</li> <li>g. How panels are fixed to the structure and the sequence of installation</li> </ul>			

<p>6. Know how metals can be used in a façade and their properties and limitations, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. Types of metals, their properties and uses, including: <ul style="list-style-type: none"> <li>i. Aluminium</li> <li>ii. Steel</li> <li>iii. Stainless steel</li> <li>iv. Galvanised steel</li> <li>v. Copper</li> <li>vi. Zinc</li> </ul> </li> <li>b. Where metal is used in a façade, what components are made from metal and why</li> <li>c. What bimetallic corrosion is, what causes it, and how it is controlled</li> <li>d. Properties of different metal and their advantages and disadvantages, including <ul style="list-style-type: none"> <li>i. Thermal properties</li> <li>ii. Acoustic properties</li> <li>iii. Chemical properties</li> </ul> </li> <li>e. How different metal fabrication methods work and what they are used to produce including: <ul style="list-style-type: none"> <li>i. Folding</li> <li>ii. Rolled</li> <li>iii. Extruded</li> </ul> </li> <li>f. Different finishes used on metal and their advantages and disadvantages to include: <ul style="list-style-type: none"> <li>i. Wet paint finish</li> <li>ii. Power coating</li> <li>iii. Anodising</li> </ul> </li> <li>g. Metal sheeting used for aesthetic purpose where they are used and advantages and disadvantages, to include: <ul style="list-style-type: none"> <li>i. Zinc</li> <li>ii. Copper</li> </ul> </li> </ul>			
<p>7. Know how wood is used in facades and its advantages and disadvantages, to include an understanding of</p> <ul style="list-style-type: none"> <li>a. The main properties of timber as a building material and the advantages and disadvantages related to its use</li> <li>b. What types of engineered mass timber there are and how they manufactured and used in facades</li> <li>c. The advantages and disadvantages of using timber composite windows</li> <li>d. How timber is used in low rise and high-rise buildings</li> <li>e. How timber is used in a façade and how it is fixed to the structure</li> </ul>			
<p>8. Know the different types of insulation used in facades, , state what its properties are, where it can be used and the advantages and disadvantages of each type. To include the following types of insulation:</p> <ul style="list-style-type: none"> <li>a. Mineral Rock Wool</li> <li>b. Insulating Sandwich Panel</li> <li>c. Glass Fibre Quilt</li> <li>d. Silicon Dioxide</li> <li>e. Aerogel insulation</li> <li>f. Cellulose insulation</li> <li>g. XPS and EPS Insulation</li> <li>h. PIR and PUR, phenolic insulation</li> <li>i. Which insulation can be used on low rise and high-rise buildings</li> <li>j. The required fire classification of insulation needed for both low rise and high-rise buildings</li> </ul>			

**Assessor Comments/Feedback**

### Knowledge of the thermal performance of different façade types

GQA Ref	FDE05	Regulatory Ref	J/651/4456	Level	5	Credit Value	5
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#### Aims

The aim of the unit is to show the learner the different factors that need to be considered at the design stage when considering the required thermal performance of the facade. The focus of this unit will be looking at the U-value of the façade, considerations relating to thermal bridging and issues surrounding condensation.

#### Assessment Guidance

This unit will be assessed through the learner producing a portfolio of evidence, the evidence required for this unit, will be:

- Completing the online multiple choice question test
- Completing the end of unit assignment
- Professional Discussion with the assessor

Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge and must use a combination of assessment methods as defined by GQA Qualifications in the qualification guidance notes.

Learning outcome; The learner will:	Evidence Ref No.		
	1	2	3
1. Know how U values are used to measure heat loss and gain on a structure and how thermal performance is measured, to cover: <ul style="list-style-type: none"> <li>a. The 3 methods of heat transfer are and how they work</li> <li>b. The term heat resistance, how it relates to thermal performance and how it is measured</li> <li>c. What U values are and how they are measured</li> <li>d. The U values that are set in Approved Document L for the external structure of a building</li> <li>e. What has an impact on the final U value of an individual product that might be used on the external structure of a building</li> <li>f. What the process is for calculating the U value of a window and how heat loss is calculated and measured</li> </ul>			
2. Know what thermal bridging is, the causes of it and how the effects can be reduced, to cover: <ul style="list-style-type: none"> <li>a. What the term thermal bridging means and how it relates to building envelopes</li> <li>b. The 4 main types of thermal bridging and what are the effects on the structure of each type</li> <li>c. How reducing the effects of thermal bridging can reduce building energy loss and improve energy efficiency</li> <li>d. How thermal bridging is reduced on a building envelope</li> <li>e. How the effects of thermal bridging are analysed</li> </ul>			
3. Know the causes and effects of condensation on a building and how these can be reduced, to include an understanding of: <ul style="list-style-type: none"> <li>a. How excessive condensation has an impact on the risks to the structure and the occupants in a building</li> <li>b. The main causes of condensation in a building and what type of surfaces it can affect</li> <li>c. The different types of condensation and where are they found in a structure and how can they be reduced</li> </ul>			

d. The term "Dew Point" and "Dew Point Line and what they refer to e. How a condensation risk analysis is carried out			
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**Assessor Comments/Feedback**

**Knowledge of the principles of fire safety in façade design and engineering**

<b>GQA Ref</b>	<b>FDE06</b>	<b>Regulatory Ref</b>	F/651/4454	<b>Level</b>	5	<b>Credit Value</b>	5
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**Aims**

The aim of the unit is to show the learner the importance of considering how fire safety will be built into a facade. Fire safety is important in any building and within the façade section of the building there are a number of factors to consider in relation to fire safety. In this unit the focus will be on, materials relating to fire safety, how to deal with cavities and other aspects to consider as part of the design process.

**Assessment Guidance**

This unit will be assessed through the learner producing a portfolio of evidence, the evidence required for this unit will be:

- Completing the online multiple choice question test
- Completing the end of unit assignment
- Professional Discussion with the assessor

Assessors for this unit must have verifiable, current industry experience and sufficient depth of relevant occupational expertise and knowledge and must use a combination of assessment methods as defined by GQA Qualifications in the qualification guidance notes.

<b>Learning outcome; The learner will:</b>	<b>Evidence Ref No.</b>		
	<b>1</b>	<b>2</b>	<b>3</b>
1. Know how materials are classified and used as approved fire rated materials to use in façade design, to include an understanding of: <ol style="list-style-type: none"> <li>a. How Approved Document B is used in the design of fire safety on a façade</li> <li>b. How product information and safety sheets are used in the design of fire safety in a façade</li> <li>c. Which standards relate to fire classification of products and the minimum classification for fire products</li> <li>d. How products are classified and how this relates to fire safety design in relation to the following:                             <ol style="list-style-type: none"> <li>i. Fire</li> <li>ii. Smoke</li> <li>iii. Flaming droplets</li> </ol> </li> <li>e. What the fire rating classifications that relate to products</li> <li>f. The melting points for the following metals:                             <ol style="list-style-type: none"> <li>i. Low carbon steel</li> <li>ii. Stainless steel</li> <li>iii. Aluminium</li> </ol> </li> <li>g. What a building fire strategy is and how it is used in façade design and engineering</li> <li>h. What products are permitted to be used in a faced, even if they are not classified as fire products</li> <li>i. What the term “Normative Reference” mean in relation to fire products</li> </ol>			
2. Know how cavities in facades are dealt with in the design process and how they are affected by fire, to include an understanding of: <ol style="list-style-type: none"> <li>a. The purpose of a cavity on a façade and how they react in a fire situation</li> </ol>			

<ul style="list-style-type: none"> <li>b. The term “chimney effect”, how this relates to fire spread in a building and how it applies to different façade types</li> <li>c. What the term compartmentation means and how it relates to the internal and external parts of a building</li> <li>d. What type of cavity closers there are and how these relate to fire safety</li> <li>e. How to comply with cavity fire safety requirements for the following: <ul style="list-style-type: none"> <li>i. BS9999</li> <li>ii. Approved Document B</li> </ul> </li> </ul>			
<p>3. Know some of the issues that relate to general compartmentation of buildings to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. Specified attachment on building what are they and how they should be treated in relation to fire safety</li> <li>b. What are the limitations of using glass balustrade on balconies in buildings in the UK from the fire safety regulation perspective.</li> <li>c. How decking and soffits on a balcony are affected by fire safety standards</li> <li>d. How spandrels are affected by fire safety standards</li> <li>e. What firestops are, and where and how can they be used on a building</li> <li>f. The areas on a façade that are classed as general compartmentation, the issues relating to these and what fire safety precautions can be taken with these</li> <li>g. The areas on a façade that are classed as soffit compartmentation, the issues relating to these and what fire safety precautions can be taken with these</li> <li>h. The areas on a façade that are classed as external corner party wall compartmentation, the issues relating to these and what fire safety precautions can be taken with these</li> </ul>			

**Assessor Comments/Feedback**

## Knowledge of designing to reduce the impact of sound transmission through a façade

GQA Ref	FDE07	Regulatory Ref	Y/651/4451	Level	4	Credit Value	5
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### Aims

The aim of the unit is to show the learner the different types of noise that can be applied to a building and the impact this has on the occupants. It will look at the actions that can be taken to reduce the impact on excessive noise on the inhabitants of the building.

### Assessment Guidance

This unit will be assessed through the learner producing a portfolio of evidence, the evidence required for this unit, will be:

- Completing the online multiple choice question test
- Completing the end of unit assignment
- Professional Discussion with the assessor

Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge and must use a combination of assessment methods as defined by GQA Qualifications in the qualification guidance notes.

Learning outcome; The learner will:	Evidence Ref No.		
	1	2	3
<p>1. Know what external noise is, how it can be tested and reduced through effective façade design, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. How external noise is measured and what the report produced shows</li> <li>b. Target sound reduction values, what part of the façade they refer to and how are they measured</li> <li>c. How the findings from a sound reduction assessment affect the make-up of and IGU</li> <li>d. Which Approved Document of the Building Regulations relate to acoustics and who else can be consulted on noise issues</li> <li>e. The acoustic performances and possible noise reduction solutions for the following areas of a façade: <ul style="list-style-type: none"> <li>i. Solid walls</li> <li>ii. Rainscreen facades</li> <li>iii. Insulated rendered systems</li> <li>iv. Unitised facades</li> <li>v. Closed joint masonry</li> <li>vi. Pre-cast concrete</li> </ul> </li> <li>f. How can the acoustic sound reduction of glass be improved by changing the make-up of an IGU</li> <li>g. How the acoustic performance of a product is evaluated</li> <li>h. The information found on a glass manufacturers' glass sound data sheet</li> <li>i. What an acoustic trickle vent is, their function and where they would be used.</li> </ul>			
<p>2. Know what the term flanking means and how it relates to acoustics in facades, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a. The term "Flanking" and how it relates to acoustics in facades</li> <li>b. Which parts of the façade can contribute to the cause of flanking sound transmission</li> </ul>			



## Knowledge of the designing process focusing on the structural aspects of the façade

GQA Ref	FDE08	Regulatory Ref	T/651/4450	Level	5	Credit Value	5
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### Aims

The aim of the unit is to show the learner the important considerations that need to be considered during the design phase on any type of facade. This unit not only focuses on the structural integrity of the façade such as the loads that will be imposed on it and the movement and tolerances that will be built in to the system, it also looks at what to consider after the building is complete. The unit will consider the design aspects in relation to how the building is to be maintained, as well as the considerations that relate to how the façade is to be installed.

### Assessment Guidance

This unit will be assessed through the learner producing a portfolio of evidence, the evidence required for this unit, will be:

- Completing the online multiple choice question test
- Completing the end of unit assignment
- Professional Discussion with the assessor

Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge and must use a combination of assessment methods as defined by GQA Qualifications in the qualification guidance notes.

Learning outcome; The learner will:	Evidence Ref No.		
	1	2	3
1. Know how different types of loads have an impact on a façade to include: <ul style="list-style-type: none"> <li>a) The definitions of the terms load and stress in relation to facades</li> <li>b) Identify the 5 types of loads that can be applied on a façade and provide an example of each type, outline what causes them and the effect they will have on a façade</li> </ul>			
2. Know how inconsistencies in tolerances and building movement can have an effect on a façade, to include an understanding of: <ul style="list-style-type: none"> <li>a) The 2 main types of tolerances that can be found on a façade</li> <li>b) What the term “permissible deviation” means when applied to a façade</li> <li>c) The permissible tolerance deviation for onsite fabricated component</li> <li>d) The allowed tolerance for the edge of an onsite cast concrete slab</li> <li>e) The methods used onsite to compensate for inconsistencies in component sizes</li> <li>f) How unitised facades deal with inconsistencies in sizes of units and concrete slabs onsite</li> <li>g) How differences in joint sizes in facades are dealt with onsite and how they are dealt with in façade interfaces</li> <li>h) What the term “Deflection” means, the 3 main types of deflection that relate to facades and how are they dealt with</li> <li>i) What is meant by the terms building sway and inter storey drift when they are applied to a façade</li> <li>j) What the main causes of expansion and contraction of a façade are</li> <li>k) The function of a lateral load bracket on a façade</li> </ul>			
3. Know the importance of access requirements for installing different types of facades, to include an understanding of: <ul style="list-style-type: none"> <li>a) How access has an impact on the construction of the façade</li> <li>b) The definitions of the following types of facades:</li> </ul>			

<ul style="list-style-type: none"> <li>i. In-situ façade</li> <li>ii. Semi-fabricated façade</li> <li>iii. Fully fabricated façade</li> </ul> <p>c) The type of access required, and the advantages and disadvantages of the access requirements for each of the following types of façade:</p> <ul style="list-style-type: none"> <li>i. In-situ façade</li> <li>ii. Semi-fabricated façade</li> </ul> <p>d) Fully fabricated façade</p>			
<p>4. Know the façade maintenance considerations that need to be considered at the façade design stage, to include an understanding of:</p> <ul style="list-style-type: none"> <li>a) What an O&amp;M manual is, who uses it and what information it should contain relating to facades</li> <li>b) What questions need to be answered in the contents of the O&amp;M manual in relation to facades</li> <li>c) How the design of the façade needs to consider issues relating to carrying out maintenance on the façade after it has been built</li> <li>d) How the provision of maintenance requirement affects the design of the façade</li> <li>e) The cost considerations relating to maintenance that need to be thought about at the design stage.</li> </ul>			

<p><b><u>Assessor Comments/Feedback</u></b></p>
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## Knowledge of the procurement processes in façade design and engineering

GQA Ref	FDE09	Regulatory Ref	H/651/4455	Level	4	Credit Value	5
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### Aims

The aim of the unit is to show the learner the procurement process that needs to be followed during the façade design process. It will look at the different routes that procurement can take, design responsibilities and the required documentation to complete. It will also focus on the different stages of design, the importance of considering façade maintenance as part of the procurement process and how and when cost and value engineering can be utilised.

### Assessment Guidance

This unit will be assessed through the learner producing a portfolio of evidence, the evidence required for this unit, will be:

- Completing the online multiple choice question test
- Completing the end of unit assignment
- Professional Discussion with the assessor

Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge and must use a combination of assessment methods as defined by GQA Qualifications in the qualification guidance notes.

Learning outcome; The learner will:	Evidence Ref No.		
	1	2	3
1. Know the different types of procurement routes that can be used, what influences the choice of route and who is involved in the process. To include an understanding of: <ul style="list-style-type: none"> <li>a. What is meant by the term procurement</li> <li>b. What factors affect the choice of the procurement route used</li> <li>c. How the design of the façade affects choice of the procurement route to be used</li> <li>d. Who is involved in the procurement route for the following types of façade design:                             <ul style="list-style-type: none"> <li>i. Masonry low rise</li> <li>ii. Masonry mid rise</li> <li>iii. Rainscreen low rise</li> <li>iv. Curtain walling low rise</li> <li>v. High rise unitised</li> <li>vi. High rise pre-cast concrete</li> </ul> </li> <li>e. Fully fabricated pre-cast panels</li> </ul>			
2. Know who has design responsibilities for different types of facades and the documentation they produce for the following façade types: <ul style="list-style-type: none"> <li>i. Masonry low rise</li> <li>ii. Masonry mid rise</li> <li>iii. Rainscreen low rise</li> <li>iv. Curtain walling low rise</li> <li>v. High rise unitised</li> <li>vi. High rise pre-cast concrete facades</li> <li>vii. Fully fabricated pre-cast panels buildings with load-bearing precast façades</li> </ul>			
3. Know why maintenance of the building needs to be considered at the design stage of the façade, who should be involved in the process and what their role is, to include an understanding of: <ul style="list-style-type: none"> <li>a. Why it is a requirement to consider the maintenance of the built façade at the design stage of the process</li> </ul>			

<p>b. Who should be included in the maintenance design aspect for the following types of façade:</p> <ul style="list-style-type: none"> <li>i. Low rise façade</li> <li>ii. Mid to high rise façade</li> <li>iii. High rise façade</li> </ul> <p>c. The role of each person involved with the maintenance of the building and what their role is at the following stages of the process:</p> <ul style="list-style-type: none"> <li>i. Concept stage</li> <li>ii. Tender stage</li> <li>iii. Construction stage</li> <li>iv. As built stage</li> </ul> <p>d. Ongoing maintenance stage</p>			
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**Assessor Comments/Feedback**

