



Qualification Specification:

OCN NI Level 3 Certificate in Embodied Carbon

- **Qualification No: 610/6497/X**

Version: 1.0



1. Specification Updates

Key changes have been listed below:

Section	Detail of change	Version and date of Issue
	Newly developed qualification	V1.0 – June 2025

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3. Introduction to Open College Network Northern Ireland (OCN NI)

The Open College Network Northern Ireland (OCN NI) is a UK recognised awarding organisation based in Northern Ireland. We are regulated by CCEA Regulation to develop and award regulated professional and technical (vocational) qualifications from Entry Level up to and including Level 5 across all sector areas. In addition, OCN NI is also regulated by Ofqual to award qualifications in England.

OCN NI is also an educational charity that advances education by developing nationally recognised qualifications and recognising the achievements of learners. We work with centres such as Further Education Colleges, Private Training Organisations, Voluntary & Community Organisations, Schools, SME's and Public Sector bodies to provide learners with opportunities to progress into further learning and/or employment. OCN NI's Strategic Plan can be found on the OCN NI website www.ocnni.org.uk.

For further information on OCN NI qualifications or to contact us, you can visit our website at www.ocnni.org.uk. The website should provide you with details about our qualifications, courses, contact information, and any other relevant information you may need.

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4. About this Specification

This specification details OCN NI's specific requirements for the delivery and assessment of the **OCN NI Level 3 Certificate in Embodied Carbon**.

This specification will provide guidelines for centres to ensure the effective and correct delivery of this qualification. OCN NI qualification specifications are based on research and engagement with the practitioner community to ensure they provide appropriate skills and knowledge for learners.

The qualification specification will detail the following aspects of the **OCN NI Level 3 Certificate in Embodied Carbon**.

- **Qualification Features:** this includes the key characteristics and features of this qualification, such as its intended audience, purpose, and credit value.
- **Centre Requirements:** this details the prerequisites and obligations that centres must fulfil to be eligible to deliver and assess this qualification. These includes guidelines on staff qualifications, resources, and required procedures.
- **Structure and Content:** this details the structure and content of the qualification including units, and any specific content that learners will be required to study.
- **Assessment Requirements:** this details assessment criteria and assessment methods for this qualification, ensuring that summative assessment approaches are clear.
- **Quality Assurance:** the quality and consistency of delivery and assessment of this qualification are of paramount importance to OCN NI. The mandatory quality assurance arrangements including processes for internal and external verification that all centres offering this qualification must adhere to are detailed.
- **Administration:** guidance on the administrative aspects of delivering this qualification, including registration, certification, and record-keeping.
- Reference to other handbooks and policies as appropriate to the qualification.

It is important to note that OCN NI will communicate any significant updates or changes to this specification in writing to our Centres. Additionally, we will make these changes available on our official website at www.ocnni.org.uk.

To stay current, please refer to the online version of this specification as it is the most authoritative and up-to-date publication. Be aware that downloaded and printed copies may not reflect the latest revisions.

4.1 Additional Support

OCN NI offers a comprehensive range of support services designed to assist Centres in meeting the delivery and quality assurance requirements of OCN NI qualifications. These services include:

- **Learner Assessment Booklets**: These booklets are created to assist learners in demonstrating the fulfilment of assessment criteria and organising the quality assurance prerequisites for each individual unit.
- **Qualification Support Pack**: A support pack has been developed to support Centres in the delivery of this qualification. The pack includes planning and assessment templates, guides to best practice, etc.
- **Professional Development for Educators**: OCN NI provides opportunities for professional development tailored to meet the various needs of practitioners and quality assurance staff. Centres can join our training sessions, available in both face-to-face and online formats, or explore a wealth of training materials by visiting www.ocnni.org.uk
- **OCN NI Subject Advisors**: Our team of subject advisors offers vital information and support to Centres. They provide guidance on specification details, non-exam assessment advice, updates on resource developments, and various training opportunities. They actively engage with subject communities through an array of networks to facilitate the exchange of ideas and expertise, to support practitioners to provide quality education programs to learners.

All centres can access information, support and guidance to support the delivery and quality assurance of this qualification by contacting their designated Business Development Advisor or by contacting us on [Contact Us | OCN NI](#)

5. About this Qualification

5.1 Qualification Regulation Information

OCN NI Level 3 Certificate in Embodied Carbon

Qualification Number: 610/6497/X

Operational start date: 15 September 2025

Review date: 14 September 2030

The qualification's operational start and end dates define the regulated qualification's lifecycle. The operational end date is the final date for learner registration, while learners have until the certificate end date to complete the qualification and receive their certificates.

It is important to note that all OCN NI regulated qualifications are listed on the Register of Regulated Qualifications (RQF), which can be found at [Ofqual Register](#). This register is maintained by Ofqual in England and CCEA Regulation in Northern Ireland. It contains information about qualifications that are regulated and accredited. It is a key resource for learners, employers, and educational institutions to verify the status and recognition of qualifications.

Centres must adhere to administrative guidelines diligently, with special attention to the fact that fees, registration, and certification end dates for the qualification may be subject to changes. It is a centre's responsibility to make itself aware of updates on any modifications to ensure compliance with the latest requirements. OCN NI provides centres with timely updates through various channels including website, newsletters and through this specification. Information on qualification fees can be found on the Centre Login section of the OCN NI website www.ocnni.org.uk.

5.2 Sector Subject Area

A subject sector area is a specific category used to classify academic and vocational qualifications. Subject sector areas are part of the educational and qualifications framework to organise and categorise qualifications. The sector subject for this qualification is:

15.3 Businessmanagement

[LANEM1 – Identify and evaluate the organisations significant environmental aspects and impacts](#)

[LANEM10 – Implement and monitor improvements recommended by an organisational environmental audit](#)

[COGSBP06 – Specify and Co-Ordinate Life Cycle Assessments in Support of Sustainable Business Practice](#)

[COGSBP12 – Complete Life Cycle Assessments in Support of Sustainable Business Practice](#)

[COGSBP34 – Manage Organisational Greenhouse Gas Reduction in Support of Sustainable Business Practice](#)
[INSCEA4 – Identify ways to optimise energy efficiency and achieve carbon reduction](#)

5.3 Grading

Grading for this qualification is pass/fail.

5.4 Qualification's Aim and Objectives

Qualification's Aim

The aim of the OCN NI Level 3 Certificate in Embodied Carbon qualification is to provide the learner with knowledge and skills to understand, measure, and reduce embodied carbon in construction materials, products, and processes.

Qualification's Objectives

The objectives of the OCN NI Level 3 Certificate in Embodied Carbon are to develop an understanding of:

- embodied carbon in the construction industry
- calculating embodied carbon within the construction industry
- the materials used to reduce embodied carbon in construction projects
- embodied carbon case studies

5.5 Target Learners

The OCN NI Level 3 Certificate in Embodied Carbon is targeted at individuals who have an interest or involvement in sustainable construction, architecture, engineering, procurement, or environmental management, particularly those seeking to understand and reduce the carbon footprint of materials and processes in the built environment.

5.6 Entry Requirements

There are no formal entry requirements for this qualification. Learners should however be at least 16 years of age.

5.7 Progression

The OCN NI Level 3 Certificate in Embodied Carbon qualification enables progression within the suite and to further learning in this area and/or relevant employment such as architecture, engineering, construction, and environmental management.

5.8 Delivery Language

This qualification is exclusively available in English. If there is a desire to offer this qualification in Welsh or Irish (Gaeilge), we encourage you to get in touch with OCN NI. They will assess the demand for such provisions and, if feasible, provide the qualification in the requested language as appropriate.

6. Centre Requirements for Delivering this Qualification

6.1 Centre Recognition

New and existing OCN NI recognised centres must apply for and be granted approval to deliver this qualification prior to the commencement of delivery.

6.2 Qualification Approval

Once a Centre has successfully undergone the Centre Recognition process, it becomes eligible to apply for qualification approval. The Centre's capability to meet and sustain the qualification criteria will be assessed. Throughout the qualification approval process, OCN NI will aim to ensure that:

- centres possess suitable physical resources (e.g., equipment, IT, learning materials, teaching rooms) to support qualification delivery and assessment
- centre staff involved in the assessment process have relevant expertise and/or occupational experience
- robust systems are in place for ensuring ongoing professional development for staff delivering the qualification
- centres have appropriate health and safety policies concerning learner equipment use
- qualification delivery by centres complies with current equality and diversity legislation and regulations
- as a part of the assessment process for this qualification, it may be useful for learners to have access to a practical work setting

6.3 Centre Staffing

To offer this qualification centres are mandated to establish the following roles as a minimum, although a single staff member may serve in more than one capacity*:

- Centre contact
- Programme Co-ordinator
- Assessor
- Internal Quality Assurer

*Note: An individual cannot serve as an Internal Quality Assurer for their own assessments.

6.4 Tutor Requirements

Tutors responsible for delivering this qualification are expected to possess a high degree of occupational competency. They should meet the following criteria:

- **Occupational Competency:** Tutors should demonstrate a clear understanding of the subject matter, including up-to-date knowledge. This competence should enable them to effectively impart knowledge and practical skills to learners.
- **Qualifications:** Tutors should hold qualifications at a level that is at least one level higher than the qualification they are teaching. This ensures that they have the necessary academic foundation to provide in-depth guidance and support to learners.

These requirements collectively ensure that learners receive instruction from highly qualified and experienced instructors, thereby enhancing the quality and effectiveness of their educational experience.

6.5 Assessor Requirements

The assessment of this qualification takes place within the Centre and is subjected to OCN NI's rigorous quality assurance procedures. The achievement of individual units is based on the criteria defined in each unit.

Assessors play a pivotal role in ensuring the validity and fairness of assessments. They are required to meet the following criteria:

- **Occupational Competency:** Assessors should possess a high degree of occupational competency in the relevant subject matter. This expertise enables them to accurately evaluate and measure a learner's knowledge and skills. Additionally, they should hold qualifications at a level that is at least one level higher than the qualification they are assessing, ensuring their in-depth understanding of the subject matter.
- **Assessment Expertise:** Assessors should have direct or related experience in the field of assessment. This includes knowledge of best practices in designing, conducting, and grading assessments. Their expertise ensures that assessments are both fair and valid.
- **Assessors Qualification:** Assessors should hold or be currently undertaking a recognised assessor's qualification; or must have attended the OCN NI Assessment Training.
- **Comprehensive Assessment Oversight:** Assessors are responsible for evaluating all assessment tasks and activities comprehensively. They must thoroughly review and assess each element to ensure a fair and accurate representation of a learner's skills and knowledge.

These rigorous requirements uphold the quality and integrity of the qualification's assessment process, ensuring that learners receive a fair and reliable evaluation of their competencies.

6.6 Internal Quality Assurer Requirements

The Internal Quality Assurer plays a crucial role in the Centre's internal quality assurance processes. The Centre must designate a skilled and trained Internal Quality Assurer who assumes the role of an internal quality monitor responsible for verifying the delivery and assessment of the qualifications.

The Internal Quality Assurer for this qualification must meet the following criteria:

- **Internal Quality Assurance Expertise:** Internal Quality Assurers should have direct or related experience in the field of verification. This includes knowledge of best practices in designing, conducting, and grading assessments. Their expertise ensures that assessments are both fair and valid.
- **Internal Quality Assurer's Qualification:** Internal Quality Assurers should hold or be currently undertaking a recognised Internal Quality Assurer's qualification; or must have attended the OCN NI Internal Quality Assurance Training.
- **Thorough Evaluation of Assessment Tasks and Activities:** Internal Quality Assurers are tasked with conducting in-depth reviews and assessments of all assessment tasks and activities. Their responsibility is to ensure a comprehensive and meticulous oversight of each element to guarantee a just and precise reflection of a learner's abilities and knowledge and to ensure that all assessment and quality assurance requirements are fulfilled.

7. Qualification Structure

7.1 Qualification Purpose

The OCN NI Level 3 Certificate in Embodied Carbon is designed to equip learners with the advanced knowledge and practical skills to understand, assess, and reduce embodied carbon across the lifecycle of materials and products, particularly within the built environment. It explores the environmental impact of construction and manufacturing processes, from raw material extraction to end-of-life disposal and introduces tools such as life cycle assessment and carbon accounting. Learners will gain insight into sustainable design, procurement strategies, and low-carbon alternatives, enabling them to make informed decisions that support climate-conscious development and contributes to the wider goal of achieving Net Zero.

7.2 Qualification Level

In the context of the OCN NI Level 3 Certificate in Embodied Carbon it is essential to understand the significance of qualification levels, as they play a pivotal role in assessing the depth and complexity of knowledge and skills required for successful attainment. This qualification aligns with Level 3 which signifies a higher level of difficulty and intricacy. It's important to note that qualification levels in the educational framework range from Level 1 to Level 8, complemented by three 'entry' levels, namely Entry 1 to Entry 3.

7.3 Qualification Size

Total Qualification Time (TQT)

This represents the total amount of time a learner is expected to spend to complete the qualification successfully. It includes both guided learning hours (GLH) and independent study or additional learning time.

Guided Learning Hours (GLH)

These are the hours of guided instruction and teaching provided to learners. This may include classroom instruction, tutorials, or other forms of structured learning.

OCN NI Level 3 Certificate in Embodied Carbon	
Total Qualification Time (TQT):	150 hours
Total Credits Required:	15 credits
Guided Learning Hours (GLH):	105 hours

7.4 How to Achieve the Qualification

To achieve the OCN NI Level 3 Certificate in Embodied Carbon the learner must successfully complete the mandatory unit and 2 units from the following optional units, for a total of 15 credits.

8. Assessment Structure

This qualification is assessed through internal assessment and each unit is accompanied by specific assessment criteria that define the requirements for achievement.

8.1 Assessment Guidance: Portfolio

The portfolio for this qualification is designed to provide a comprehensive view of a learner's skills and knowledge. It is an holistic collection of evidence that may include a single piece of evidence that satisfies multiple assessment criteria. There is no requirement for learners to maintain separate evidence for each assessment criterion.

When learners are creating their portfolio, they should refer to the assessment criteria to understand the evidence required.

It is essential that the evidence in the portfolio reflects the application of skills in real-world situations. Learners should ensure that they provide multiple examples or references whenever the assessment criteria require it.

When demonstrating knowledge, learners may draw from their own organisation or another organisation they are familiar with to provide context.

8.2 Understanding the Units

The units outlined in this specification establish clear assessment expectations. They serve as a valuable guide for conducting assessments and ensuring quality assurance efficiently. Each unit within this specification follows a consistent structure. This section explains the operational framework of these units. It is imperative that all educators, assessors, Internal Quality Assurers, and other personnel overseeing the qualification review and familiarise themselves with this section to ensure a comprehensive understanding of how these units function.

- **Title:** The title will reflect the content of the unit and should be clear and concise.
- **Level:** A unit can have one of six RQF levels: Entry, One, Two, Three, Four or Five. All units within this qualification are level 3.
- **Credit Value:** This describes the number of credits ascribed to a unit. It identifies the number of credits a learner is awarded upon successful achievement of the unit. One credit is awarded for the learning outcomes which a learner, on average, might reasonably be expected to achieve in a notional 10 hours of learning.
- **Learning Outcome:** A coherent set of measurable achievements.
- **Assessment Criteria:** These enable a judgement to be made about whether or not, and how well, the students have achieved the learning outcomes.
- **Assessment Guidance and Methods:** These detail the different assessment methods within the unit that may be used.
- **Content:** This provides indicative content to assist in teaching and learning.
- **Scope:** This provides possible teaching content.

9. Qualification Summary by Unit

OCN NI Level 3 Certificate in Embodied Carbon

Total Qualification Time (TQT) for this qualification: 150 hours

Guided Learning Hours (GLH) for this qualification: 105 hours

In order to achieve the OCN NI Level 3 Certificate in Embodied Carbon, the learner must successfully complete the mandatory unit and 2 units from the following optional units, for a total of 15 credits.

Unit Reference Number	OCN NI Unit Code	Unit Title	Credit Value	GLH	Level
Mandatory unit					
H/651/7697	CBG795	Embodied Carbon in the Construction Industry	3	21	Three
Optional units					
J/651/7698	CBG796	Calculating Embodied Carbon within the Construction Industry	6	42	Three
K/651/7699	CBG797	Use of Materials to Reduce Embodied Carbon in Construction Projects	6	42	Three
Y/651/7700	CBG798	Embodied Carbon Case Studies	6	42	Three

10. Unit Content

10.1 Embodied Carbon in the Construction Industry

Title	Embodied Carbon in the Construction Industry
Level	Three
Credit Value	3
Guided Learning Hours (GLH)	21
OCN NI Unit Code	CBG795
Unit Reference No	H/651/7697
Learn Direct Code	QA1
<i>Unit purpose and aim(s):</i> This unit will enable the learner to understand how embodied carbon is identified in the construction process, scope of emissions and how carbon emissions may be minimised.	
Learning Outcomes	Assessment Criteria
1. Understand what is meant by embodied carbon and its relationship to greenhouse gases in the construction industry.	1.1. Explain what is meant by embodied carbon. 1.2. Classify total greenhouse gas (GHG) emissions associated with the production, transportation, and disposal of a given product or system. 1.3. Explain how the total GHG of the given product or system identified in AC 1.2 encompasses the entire life cycle of a product or system, including: a) the extraction of raw materials b) manufacturing processes c) transportation d) installation e) maintenance f) end-of-life disposal
2. Understand the impact of embodied carbon on the environment and associated scope of emissions.	2.1. Summarise two main components of embodied carbon. 2.2. Explain the impact of climate change on the environment and humans. 2.3. Explain what is meant by a direct emission. 2.4. Critically compare scope 1 and scope 2 emissions. 2.5. Explain the requirement of scope 3 emissions.
3. Understand how design choices can reduce carbon emissions.	3.1. Explain how the application of the Life Cycle Assessment (LCA) methodology is used to quantify embodied carbon and other environmental impacts throughout a product's life cycle. 3.2. Describe how generative Artificial Intelligence (AI) may be used to evaluate different designs based on specified criteria such as: a) structural integrity b) energy efficiency c) material use 3.3. Explain how generative AI can be used to evaluate extensive databases of materials and associated environmental impacts in order to decrease carbon emissions.

4. Understand responses to embodied carbon, carbon accounting and the impact of legislation on construction projects.

- 4.1. Analyse local, national and international responses to embodied carbon.
 4.2. Explain what is meant by the term carbon accounting.
 4.3. Explain how local government legislation in relation to embodied carbon, affects construction projects.

Assessment Guidance

NOS:

[COGSBP34 – Manage Organisational Greenhouse Gas Reduction in Support of Sustainable Business Practice](#)

[COGSBP06 – Specify and Co-Ordinate Life Cycle Assessments in Support of Sustainable Business Practice](#)

The following assessment method/s may be used to ensure all learning outcomes and assessment criteria are fully covered.

Assessment Method	Definition	Possible Content
Portfolio of evidence	A collection of documents containing work undertaken to be assessed as evidence to meet required skills outcomes OR A collection of documents containing work that shows the learner's progression through the course	Learner notes/written work Learner log/diary Peer notes Record of observation Record of discussion
Practical demonstration/assignment	A practical demonstration of a skill/situation selected by the tutor or by learners, to enable learners to practise and apply skills and knowledge	Record of observation Learner notes/written work Learner log

Learning Outcome	Unit title: Embodied Carbon in the Construction Industry
1. Understand what is meant by embodied carbon and its relationship to greenhouse gases in the construction industry.	Scope Teaching will cover: Understanding what is meant by embedded carbon and how values are attributed to construction materials, methods and processes. • Knowing the different Green House Gases (GHG) • Understanding how the different Green House Gases (GHG) are generated • Being able to identify the 6 cycles of Carbon/GHG emissions
2. Understand the impact of embodied carbon on the environment and associated scope of emissions.	Scope Teaching will cover: The student being able to identify at which phase of a construction process the embedded carbon is at its greatest level. • Recognise the areas of the construction process host the main percentages of embodied carbon • Know how to evaluate the GHG from the range of processes that release carbon from construction projects • Realise the impact of climate change in relation to carbon emissions • Acknowledge Global warming in relation to carbon emissions • Understand Scope's 1, 2 and 3
3. Understand how design choices can reduce carbon emissions.	Scope Teaching will cover: Knowing the LCA – Life Cycle Assessment of materials and their design impact on construction projects. • Cradle to Grave carbon values of the constructed project • The use of software packages to assist in decarbonisation • The evolution of AI to model the most sustainable construction projects
4. Understand responses to embodied carbon, carbon accounting and the impact of legislation on construction projects.	Scope Teaching will cover: Recognising the legislative changes that will drive Net Zero 2025-2050. • Building Regulations, local and national • Environmental Regulations, local and national • Carbon accounting • Carbon Offsetting

10.2 Calculating Embodied Carbon within the Construction Industry

Title	Calculating Embodied Carbon within the Construction Industry	
Level	Three	
Credit Value	6	
Guided Learning Hours (GLH)	42	
OCN NI Unit Code	CBG796	
Unit Reference No	J/651/7698	
Learn Direct Code	QA1	
<i>Unit purpose and aim(s):</i> This unit will enable the learner to gain an understanding of embodied carbon values and be able to use embodied carbon calculators (EC). The learner will also understand how to make comparisons of carbon release within other industries.		
Learning Outcomes		Assessment Criteria
1. Understand how embodied carbon is measured in a lifespan format.	1.1. Explain the lifespan cycles in relation to embodied carbon and define the following cradle to grave stages: a) A1-A3 b) A4 c) WF d) C2 e) C3-C4 f) C2-C4	
2. Understand how embodied carbon is calculated.	2.1. Describe how embedded carbon is calculated in the production, delivery and installation of construction products and components.	
3. Be able to calculate and display the estimated embodied carbon for concrete floor construction projects.	3.1. Calculate and display the estimated embodied carbon for two given concrete floor construction projects.	
4. Be able to calculate and display carbon emissions from non-construction industries.	4.1. Calculate and display the carbon emissions produced for the following in the same format as the projects identified in AC 3.1: a) commercial flights b) domestic vehicles c) consumption of given fast foods	
5. Be able to recalculate values of embedded carbon for construction projects.	5.1. Demonstrate how to re-calculate the estimated embodied carbon for the concrete floor construction projects identified in AC 3.1 in order to illustrate carbon reductions.	
Assessment Guidance Re: AC 3.1. The following or similar projects may be used for the assessment of AC 3.1. A Concrete Precast 150mm Hollow Slab structure floor area 100m3 with a 60-year lifespan A Concrete Screed Lower Floor 1:4 cement: sand mix avg. UK cement mix, 100m3 a with a 60-year lifespan		
NOS: COGSBP06 – Specify and Co-Ordinate Life Cycle Assessments in Support of Sustainable Business Practice COGSBP12 – Complete Life Cycle Assessments in Support of Sustainable Business Practice		
The following assessment method/s may be used to ensure all learning outcomes and assessment criteria are fully covered.		
Assessment Method	Definition	Possible Content
Portfolio of evidence	A collection of documents containing work undertaken to	Learner notes/written work Learner log/diary Peer notes

	be assessed as evidence to meet required skills outcomes OR A collection of documents containing work that shows the learner's progression through the course	Record of observation Record of discussion
Practical demonstration/assignment	A practical demonstration of a skill/situation selected by the tutor or by learners, to enable learners to practise and apply skills and knowledge	Record of observation Learner notes/written work Learner log

Learning Outcome	Unit title: Calculating Embodied Carbon within the Construction Industry
1. Understand how embodied carbon is measured in a lifespan format.	Scope Teaching will cover: Knowing the carbon journey and stages of measurement and calculation • Understand what carbon cradle means • Be able to work through the 6 embodied carbon stages • Understand what the carbon grave means
2. Understand how embodied carbon is calculated.	Scope Teaching will cover: The values and amounts of carbon embodied within different construction materials, and how decisions can be made to reduce carbon at design stage. • Carbon at product inception • Carbon miles – delivery and the choice we make • Carbon generation in the installation/construction of the components
3. Be able to calculate and display the estimated embodied carbon for concrete floor construction projects.	Scope Teaching will cover: The student learning how to take different construction products and making real time decisions on design and products that can affect carbon calculations. • Selecting construction products to reduce embedded carbon • Selecting working methodology that will reduce embedded carbon • Calculating the carbon of construction projects • Compare findings against other carbon pollution areas
4. Be able to calculate and display carbon emissions from non-construction industries.	Scope Teaching will cover: Understanding how and where carbon is generated. • Cars – Diesel and Petrol • Planes – Aviation Gas (Diesel) • Ships – Diesel • Food production – Electricity and Gas • IT Computer banks – high electrical energy usage • AI Storage banks – high electrical energy usage • Gas/Oil and Coal boilers – their percentage of emissions
5. Be able to recalculate values of embedded carbon for construction projects.	Scope Teaching will cover: The students actively working out alternative de-carbonisation strategies through selecting and designing different ways of working and using different products. • Alternative construction products • Non-Routine – Non-traditional - new ways of working • Understanding decisions and their carbon outcomes

10.3 Use of Materials to Reduce Embodied Carbon in Construction Projects

Title	Use of Materials to Reduce Embodied Carbon in Construction Projects
Level	Three
Credit Value	6
Guided Learning Hours (GLH)	42
OCN NI Unit Code	CBG797
Unit Reference No	K/651/7699
Learn Direct Code	QA1
<i>Unit purpose and aim(s):</i> This unit will enable the learner to understand embodied carbon (EC) in different materials and how this can be reduced through choice of materials.	
Learning Outcomes	Assessment Criteria
1. Be able to determine the prebuild site requirements of a construction project.	1.1. Determine the prebuild site requirements of a given construction project, considering the availability of materials and embodied carbon levels.
2. Be able to determine the suitability of new and emerging materials with low EC for construction projects.	2.1. Summarise two methods where materials can be reused, repurposed, or recycled. 2.2. Explain how the design process may reduce embodied carbon within a given construction project using existing structures. 2.3. Explain what is meant by a biogenic carbon. 2.4. Determine the suitability of new and emerging materials with low EC for a given construction project.
3. Be aware of materials that can be used in traditional buildings to retain aesthetics but reduce embodied carbon.	3.1. Explain the design aspects of dealing with properties in heritage or conservation areas. 3.2. Describe materials commonly used to complete repairs and modifications which also reduce embodied carbon. 3.3. Evaluate the requirements for listed buildings in own region in relation to potential barriers to reducing embodied carbon.
4. Be able to carry out a calculation of embodied carbon and determine where embodied carbon may be reduced in construction projects.	4.1. Carry out a calculation of the embodied carbon for a given construction project. 4.2. Determine for the construction project identified in AC 4.1 areas where embodied carbon may be reduced and offer alternative materials or work methods showing the carbon reduction. 4.3. Summarise EC reduction techniques which may be employed in future design considerations.

Assessment Guidance
NOS:

INSCEA4 – Identify ways to optimise energy efficiency and achieve carbon reduction

The following assessment method/s may be used to ensure all learning outcomes and assessment criteria are fully covered.

Assessment Method	Definition	Possible Content
Portfolio of evidence	A collection of documents containing work undertaken to be assessed as evidence to meet required skills outcomes OR A collection of documents containing work that shows the learner's progression through the course	Learner notes/written work Learner log/diary Peer notes Record of observation Record of discussion
Practical demonstration/assignment	A practical demonstration of a skill/situation selected by the tutor or by learners, to enable learners to practise and apply skills and knowledge	Record of observation Learner notes/written work Learner log

Learning Outcome	Unit title: Use of Materials to Reduce Embodied Carbon in Construction Projects
1. Be able to determine the prebuild site requirements of a construction project.	Scope Teaching will cover: Understanding the decisions that will enable a structure to be built, how and when these decisions are made and the lifelong effects they can have • Clients' expectations • Architectural designs • Specifiers product selections • Legislation – building control – environmental actions • Use of the building • Green washing
2. Be able to determine the suitability of new and emerging materials with low EC for construction projects.	Scope Teaching will cover: New design ideas that have low or no embedded carbon • Know what is meant by and effective reused, repurposed, or recycled can be. • Know the materials that have low embedded carbon such as, recycled materials, low-carbon bricks, green tiles, green concrete, and natural materials like timber and hempcrete. • Understand what and where Biogenic Carbon comes from
3. Be aware of materials that can be used in traditional buildings to retain aesthetics but reduce embodied carbon.	Scope Teaching will cover: the understanding that not all construction and that there is a rise in heritage construction as low carbon option to new construction • Listed buildings • Heritage sites • National Trust • Students will learn the advantages of renewing the above building types and also the low carbon challenges for these buildings
4. Be able to carry out a calculation of embodied carbon and determine where embodied carbon may be reduced in construction projects.	Scope Teaching will cover: the ability to de-construct an existing building to measure the embedded carbon • Understand the construction properties and find their carbon values • Brick/Block/Plaster/Concrete/Floor Screed/Doors/Windows • Be able to show an improvement in the carbon of a structure through implementing change

10.4 Embodied Carbon Case Studies

Title	Embodied Carbon Case Studies
Level	Three
Credit Value	6
Guided Learning Hours (GLH)	42
OCN NI Unit Code	CBG798
Unit Reference No	Y/651/7700
Learn Direct Code	QA1
<i>Unit purpose and aim(s):</i> This unit will enable the learner to understand the application of embodied carbon case studies to promote carbon reduction within the construction industry including carbon reduction targets and standards.	
Learning Outcomes	Assessment Criteria
1. Understand how embodied carbon case studies are used in the construction industry.	1.1. Explain the difference between embodied carbon and operational carbon within the construction industry. 1.2. Explain how embodied carbon case studies help architects, engineers, and developers make informed decisions about materials and construction methods to minimise the environmental impact of their projects.
2. Understand the standards that relate to embodied carbon in the construction industry.	2.1. Identify the current sustainability assessment of construction works standard. 2.2. Explain how the environmental product declarations are measures against BS EN 15978. 2.3. Summarise the key aspects of Publicly Available Specification (PAS) 2080 Carbon Management Standard.
3. Understand the construction methods used in the construction of domestic and commercial building.	3.1. Identify the following in relation to the construction of domestic and commercial buildings: a) four types of substructure foundations b) four types of superstructure design of external walls c) three types of superstructure design of internal walls 3.2. Identify the construction methods and materials used for the following: a) ground floors b) two different types of intermediated floor 3.3. Explain the difference between pitched and flat roofs.
4. Understand the process of whole life carbon case study assessment.	4.1. Explain how carbon impacts over the entire life cycle of a building, from its construction through to its end of life. 4.2. Explain the four main stages of the whole life carbon assessment process. 4.3. Explain the reuse, recovery, recycling stage of a whole life carbon case study.
5. Be able to carry out a case study of domestic building using traditional construction methods.	5.1. Analyse the construction of a new dwelling using traditional sub and superstructure building methods using: a) only masonry products b) both timber and masonry products

	5.2. Carry out a case study of a domestic building including localised factors that should be considered.	
6. Be able to carry out a case study of small commercial building using traditional construction methods.	6.1. Analyse the construction of a new small commercial building using traditional sub and superstructure building methods using: a) only masonry products b) both timber and masonry products 6.2. Carry out a case study of a new small commercial building including localised factors that should be considered.	
Assessment Guidance NOS: LANEM1 – Identify and evaluate the organisations significant environmental aspects and impacts LANEM10 – Implement and monitor improvements recommended by an organisational environmental audit		
The following assessment method/s may be used to ensure all learning outcomes and assessment criteria are fully covered.		
Assessment Method	Definition	Possible Content
Portfolio of evidence	A collection of documents containing work undertaken to be assessed as evidence to meet required skills outcomes OR A collection of documents containing work that shows the learner’s progression through the course	Learner notes/written work Learner log/diary Peer notes Record of observation Record of discussion
Practical demonstration/assignment	A practical demonstration of a skill/situation selected by the tutor or by learners, to enable learners to practise and apply skills and knowledge	Record of observation Learner notes/written work Learner log

Learning Outcome	Unit title: Embodied Carbon Case Studies
1. Understand how embodied carbon case studies are used in the construction industry.	Scope Teaching will cover: Realising that carbon has dual life cycles, embodied and operational. - Know what operational carbon means - Recognise that historical carbon case studies and carbon measurement can reshape future carbon emissions
2. Understand the standards that relate to embodied carbon in the construction industry.	Scope Teaching will cover: Acknowledging sustainable construction methods and the positive effects it has on decarbonisation. - Understand the normative document BS EN 15978. - Appreciate the standard, Publicly Available Specification (PAS) 2080 Carbon Management Standard.
3. Understand the construction methods used in the construction of domestic and commercial building.	Scope Teaching will cover: The construction process, and will identify the Net Zero approach to the design, specification, material selection, transportation, construction and life operation of all phases to include: - Foundations - Superstructures - Ground Floors - Intermediate Floors - Internal Walls - Roof Type Selection
4. Understand the process of whole life carbon case study assessment.	Scope Teaching will cover: The construction process and its carbon impact. - Know the four main stages of the whole life carbon assessment construction process. - Appreciate the reuse, recovery and recycling stage of a whole life construction carbon case study
5. Be able to carry out a case study of domestic building using traditional construction methods.	Scope Teaching will cover: How a student can conduct and complete an embedded carbon case study, to include and assess the following materials and work methods for a domestic dwelling. - masonry products for the sub structure - masonry products for the superstructure - wood products for the sub structure - wood products for the superstructure - complete an evaluation of embedded carbon of your findings
6. Be able to carry out a case study of small commercial building using traditional construction methods.	Scope Teaching will cover: How a student can conduct and complete an embedded carbon case study, to include and assess the following materials and work methods for a small commercial building. - masonry products for the sub structure - masonry products for the superstructure - wood products for the sub structure - wood products for the superstructure - complete an evaluation of embedded carbon of your findings

11. Quality Assurance of Centre Performance

11.1 Internal Assessment

When delivering and assessing this qualification, Centres must align with stakeholders' expectations and address learners' needs by implementing a practical and applied programme. Centres have the flexibility to customise programmes to meet local requirements and establish connections with local employers and the broader vocational sector.

The Assessor should work with the Internal Quality Assurer to ensure that the assessment is planned in line with OCN NI requirements. Assessment Plans must be developed and approved by the Internal Quality Assurer prior to the delivery of the qualification.

All units within this qualification must undergo internal assessment. Learners must provide evidence that they have appropriately met all assessment criteria required for that grade.

The assessment format for all units involves a task conducted after the delivery of the unit's content, or part of it, if multiple tasks are used. Tasks may exhibit in various forms, encompassing practical and written types. Please refer to 'OCN NI's Assessment Definitions Guide' for additional details.

A task constitutes a distinct activity completed independently by learners, separated from teaching, practice, exploration, and other activities guided by tutors. Tasks are assigned to learners with a specified start date, completion date, and explicit requirements for the evidence to be produced. Some tasks may include observed practical components and require diverse forms of evidence.

A valid assignment will enable a clear and formal assessment outcome, which meets the requirements of the assessment criteria. Assessment decisions are based on the specific assessment criteria given in each unit and set at each grade level. The way in which individual units are written provides a balance of assessment of understanding, practical skills and vocational attributes appropriate to the purpose of qualifications.

It is the Assessor's role to ensure that learners are appropriately prepared for assessment, this begins from induction onwards. Assessors should ensure that learners understand how assessment tasks are used to determine the award of credit, the importance of meeting assessment timelines, and that all learners work must be independently created, where source documents are used this should be appropriately referenced, learners should be aware of what would constitute plagiarism and the possible consequences.

When conducting the assessment, Assessors must ensure they do not provide direct input, instructions or specific feedback which may compromise the authenticity of the work submitted.

Once the Assessor has authenticated the learners work, they must transparently demonstrate the rationale behind their assessment decisions. Once a learner completes all assigned tasks for a unit, the Assessor will allocate a grade for the unit. Refer to the 'Unit Grading Matrix' for additional information on the grading process.

Once the Assessor has completed the assessment process for the task, the assessment decision is recorded formally, and feedback is provided to the learner. The feedback should show the learner the outcome of the assessment decision, how it was determined or where the criteria has been met, it may indicate to the learner why achievement of the assessment criteria has not been met. It must be clear to the learner that this Assessment outcome is subject to verification.

For further information on assessment practice, please see the 'OCN NI Centre Handbook'. Assessment Training is also available and can be booked through the OCN NI Website.

11.2 Internal Quality Assurance

The role of the Internal Quality Assurer is to ensure appropriate internal quality assurance processes are carried out. The Internal Quality Assurer must oversee that assessments are conducted in accordance with relevant OCN NI policies, regulations, and this specification.

The Internal Quality Assurer must ensure assessments are fair, reliable, and uniform, thereby providing a consistent standard for all learners.

Internal Quality Assurers are required to provide constructive feedback to Assessors, identifying areas of strength and those that may require improvement. This feedback contributes to the ongoing professional development of Assessors.

Contributing to the standardisation of assessment practices within the Centre is an important function of this role. This entails aligning assessment methods, grading criteria, and decision-making processes to maintain fairness and equity.

Internal Quality Assurers will actively engage in the sampling and monitoring of assessments to ensure the consistency and accuracy of assessment decisions. This process helps identify trends, areas for improvement, and ensures the robustness of the overall assessment system.

For further information on Internal Quality Assurance practice, please see the 'OCN NI Centre Handbook'. Internal Quality Assurance Training is also available and can be booked through the OCN NI Website.

11.3 Documentation

For internal quality assurance processes to be effective, the internal assessment and Internal Quality Assurance team needs to keep effective records.

- The programme must have an assessment and Internal Quality Assurance plan. When producing a plan, they should consider:
 - the time required for training and standardisation activities
 - the time available to undertake teaching and carry out assessment,
 - consider when learners may complete assessments and when quality assurance will take place
 - the completion dates for different assessment tasks
 - the date by which the assignment needs to be internally verified
 - sampling strategies
 - how to manage the assessment and verification of learners' work so that they can be given formal decisions promptly
 - how resubmission opportunities can be scheduled

The following documents are available from OCN NI and document templates can be found in the Centre Login section of the OCN NI website www.ocnni.org.uk:

- A1 – Learner Assessment Record per Learner
- Learner authentication declarations
- Records of any reasonable adjustments applied for and the outcome – please see 'OCN NI's Reasonable Adjustments and Special Consideration Policy' for further information
- M1 Internal Quality Assurance Sample Record
- M2 Feedback to Assessor
- Records of any complaints or appeals

11.4 External Quality Assurance

All OCN NI recognised centres are subject to External Quality Assurance. External quality assurance activities will be conducted to confirm continued compliance with the CCEA Regulation General Conditions of Recognition, OCN NI terms and conditions and the requirements outlined within this qualification specification.

The External Quality Assurance is assigned by OCN NI. The External Quality Assurer will review the delivery and assessment of this qualification. This will include, but is not limited to, the review of a sample of assessment evidence and evidence of the Internal Quality Assurance of assessment and assessment decisions. This will form the basis of the External Quality Assurance report and will help OCN NI determine the Centres risk.

The role of the External Quality Assurer serves as an external overseer of assessment quality, working to uphold consistency, compliance, and continuous improvement within the assessment process. Their role is crucial in ensuring that assessments are valid, reliable, fair, and aligned with the required standards and regulations.

For further information on OCN NI Centre Assessments Standards Scrutiny (CASS) Strategy, please see the OCN NI Centre Handbook.

11.5 Standardisation

As a process, standardisation is designed to ensure consistency and promote good practice in understanding and the application of standards. Standardisation events:

- make qualified statements about the level of consistency in assessment across centres delivering a qualification
- make statements on the standard of evidence that is required to meet the assessment criteria for units in a qualification
- make recommendations on assessment practice
- produce advice and guidance for the assessment of units
- identify good practice in assessment and Internal Quality Assurance

Centres offering this qualification must carry out internal standardisation activities prior to the claim for certification.

Centres offering units of an OCN NI qualification must attend and contribute assessment materials and learner evidence for standardisation events if requested.

OCN NI will notify centres of the nature of sample evidence required for standardisation events (this will include assessment materials, learner evidence and relevant Assessor and Internal Quality Assurer documentation). OCN NI will make standardisation summary reports available and correspond directly with centres regarding event outcomes.

12. Administration

12.1 Registration

A centre must register learners for this qualification within 20 days of commencement of the delivery of the programme.

For further information on learner registration please see the OCN NI Centre Handbook and the QuartzWeb Manual, available through the Centre Login section of the OCN NI website. Administration training is also available and can be booked through www.ocnni.org.uk.

12.2 Certification

Once all internal quality assurance activities have been successfully completed, the Centre can claim certification for the learner(s).

Certificates will be issued to centres within 20 working days from completion of a satisfactory external quality assurance activity, if appropriate, alternatively from the submission of an accurate and complete marksheet.

It is the responsibility of the centre to ensure that certificates received from OCN NI are held securely and distributed to learners promptly and securely.

For further information on the uploading of results please see the QuartzWeb Manual for guidance, administration training is also available and can be booked through [OCN NI](#)

12.3 Charges

OCN NI publishes all up-to-date qualification fees in its Fees and Invoicing Policy document. Further information can be found on the centre login area of the OCN NI website.

12.4 Equality, Fairness and Inclusion

OCN NI's are committed to ensuring all learners have an equal opportunity to access our qualifications and assessment, and that our qualifications are awarded in a way that is fair to every learner.

OCN NI is committed to making sure that:

- learners with a protected characteristic are not, when they are undertaking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic
- all learners achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers

For information on reasonable adjustments and special considerations please see the OCN NI Centre Handbook and Reasonable Adjustments and Special Considerations Policy held in the back office of the OCN NI website.

12.5 Retention of Evidence

OCN NI has published guidance for centres on the retention of evidence. Details are provided in the OCN NI Centre Handbook and can be accessed via the OCN NI website.

OCN NI Level 3 Certificate in Embodied Carbon

Qualification Number: 610/6497/X

Operational start date: 15 September 2025
Review date: 14 September 2030

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12.6 Appendix 1 - Definition of OCN NI's Assessment Verbs

The following verbs are working definitions of those used in OCN NI assessments with examples of how they can be applied and used in different but equally valid contexts.

Verb	Definition	Example
Analyse	To examine closely and break into components to enable results to be interpreted and findings presented.	The learner will be expected to perform a critical process which will involve closely examining data, breaking it into meaningful components, interpreting the results, and presenting clear findings to inform future decisions and / or draw meaningful conclusions.
Calculate	To determine something using a mathematical method to find an answer or result.	The learner will be expected to have the knowledge and understanding to select the correct mathematical formula they should use to work out the answer needed for a specific task. Learners will need to use appropriate formulas and perform accurate computations to successfully meet the criteria asked of them.
Carry out	To effectively utilise information, items, or equipment to achieve specific objectives, produce tangible outcomes, or enhance understanding.	The learner will be expected to comprehend the information, items, or equipment they are required to use. This involves understanding the purpose, function, and relevance of the resources. The learner must carry out tasks using the information, items, or equipment to produce specific results. This involves following procedures accurately and demonstrating the ability to use resources effectively. The learner uses the resources to address challenges and find solutions. This involves planning, organising, and executing tasks in a streamlined manner.
Classify	To arrange or organise items, information, or concepts into categories or groups based on shared characteristics or criteria.	The learner will be expected to sort things in a systematic way to better understand their relationships and distinctions. This logistical process will help make information more manageable and easier to analyse or retrieve.

Critically Compare	To examine two or more items by identifying their similarities and differences and then evaluate the significance of those points using reasoned judgment and evidence.	The learner will be expected to highlight key similarities and differences. Importantly, they need to delve deep and explain why these key points matter and support with evidence, theory, or examples. They may give opinion or make a judgment about which is more effective, relevant, or valid.
Demonstrate	To undertake an activity on a system or process showing complex skills and knowledge in more than one familiar and unfamiliar area and/or contexts.	The learner will be expected to demonstrate how to use tools, equipment, applications or follow a specific process requiring them to apply theoretical knowledge or skills in real-world scenarios to demonstrate competency and practical understanding.
Describe	To paint a full picture of a concept, process or thing in words.	The learner will be expected to explore a concept, process, or object and provide a detailed verbal or written account that includes significant features, characteristics, and relevant details. The learner should be able to demonstrate the ability to convey a comprehensive understanding and include all key components, stages and/or features of concept, process, or object being described.
Determine	To ascertain or establish something precisely through examination, investigation, and/or calculation, often leading to a decision, conclusion, or resolution.	The learner will be expected to identify or decide upon specific information, outcomes, or solutions based on analysis, evidence, calculation and/or reasoning within a given context.
Explain	Make clear a given subject matter and / or give reasons for and/or the procedure in a given situation or regarding a given subject matter / Setting out purposes or reasons.	The learner will be expected to provide clarity on the subject, outlining the procedure or procedures associated with it, and set out reasons for its importance and / or significance. The learner will be expected to demonstrate a detailed comprehension of the subject matter.
Evaluate	An evaluation is normally detailed and provides a solution or conclusion and/or recommendation (perhaps for further exploration). An evaluation could include a comparative element and will ascertain the usefulness or contribution of each part to the whole.	The learner will be expected to assess, analyse, and form judgments about a subject, considering its merits, shortcomings, and potential improvements based on evidence and reasoning.

Identify	To select and list appropriate items from information that you have been given or collected.	The learner will be expected to review a set of data, information or items, and accurately select and list the required individual elements of data, information or items. The learner should be able demonstrate the ability to filter relevant information from a broader set, showing comprehension and attention to detail.
Summarise	To provide a brief account giving the main points of a topic or range of topics.	The learner will be expected to examine a topic or set of information and condense it into a concise summary that captures the essential points, themes, or arguments, without including unnecessary details. The learner should be able to demonstrate the ability to distill complex or extensive information into its core components and present it in a clear and coherent manner focusing on the most significant aspects and omitting extraneous details.