



Checklist for circular plastic in construction and reduction of construction waste

Introduction and purpose of the checklist

This checklist intended for public procurement construction contracts for reducing plastic and construction waste from construction sites and increasing the demand for reusable, recycled and recyclable materials and packaging at construction sites. This checklist and guidance material is based on the TREASoURcE stakeholder demonstration seminar on reduction of plastic construction waste in Ostfold and with insights from Norwegian NADA-project (Asker/Oslo) and Finnish construction criteria for selected plastic films and protective plastic sheets.

This checklist and guidance material consists of five main parts, exploring the higher order circular options first. The first part is a pre-analysis section for contracting authorities that want to explore alternatives to constructing a new building, like renovation of an existing building. If this option will not be considered, proceed to step 2.

The checklist contains suggestions of minimum requirements and award criteria that the contracting authorities can use in their tender. Writing in red font is text that must be adapted and changed by the contracting authority according to the needs of the individual contract.

Step 2 is intended for contracting authorities and public procurement advisors and project managers for construction. It relates to measures and considerations the contracting authority should consider to promote the long-term circularity of the building, like design for reuse, disassembly and reduction of plastic and construction waste.

Step 3 focuses on market inquiry to investigate the potential to reduce the amount of plastic packaging and casing, and what measures contractors can undertake to reduce and minimise waste from the construction site throughout the construction period.

The fourth step focuses on investigating the potential for making requirements or award criteria to increase reuse and takeback schemes for selected construction materials.

The fifth step is intended for market inquiries for contract authorities to investigate the potential to increase the demand for recycled content of and the recyclability of specific plastic films. These refer to film plastics for packaging and indoor protection and protective sheet plastic films and shrink and film plastic sheets for indoor protection.



1. Pre-analysis

Consider if you can fill the need by renovating an existing building instead of constructing a new building. Make a structural assessment of renovation options and if you can reuse construction elements. It may be appropriate to seek external expertise in making this assessment.

When doing so, quality requirements and criteria for evaluating the different bids are important.

Below you will find some selected relevant themes for requirements and evaluation of the different bids.

Theme	Requirement specification
Terms for the composition of the competences of the personnel offered	<p>“The team must include individuals with expertise and experience in early-stage assessments involving new construction and renovation. The following fields are considered particularly relevant:</p> <ul style="list-style-type: none">Structural condition analysisbuilding rehabilitation.Greenhouse gas calculations (including experience with the tools offered)Building adaptability/transformation potential. <p>The functions the building is to fulfil (with a view to reassessing space requirements/standards).</p> <p>Potential for reuse and material recycling.</p> <p>Energy consumption during operation.</p> <p>Environmental mapping.”</p>
Methodology Requirements for the method that will be used to calculate climate footprint and material footprint of the different solutions	<p>A set of criteria is being developed against which relevant alternatives will be assessed. These can be divided into ‘must’ and ‘can’ requirements. The relevant alternatives will be on a scale between new construction with or without reuse of building components at one end and complete or partial renovation with expansion at the other.</p> <p>The calculations must be performed in such a way that the alternatives are as comparable as possible within this project. The calculations shall be made in accordance with NS3720 and shall initially cover phases A1-A4, B2-B4 and C1-C4, as well as demolition in a new building alternative. Software used in the analysis must be approved for documenting greenhouse gas emissions in accordance with BREEAM-NOR, topic Mat 01</p>
References for construction projects	<p>The tenderer shall specify a maximum of three reference projects from the last 5 years where renovation/extension and new</p>



where considerations on rehabilitation vs new construction have been offered.	construction have been assessed against each other. The solution that was chosen shall be specified.
Understanding of the task	<p>The tenderer shall explain how the task described in the requirements specification will be performed (maximum two pages), including:</p> <p>Methodology for the study:</p> <p>The tenderer shall specify the methodology, implementation model and calculation tools based on what is relevant and ensures the high professional quality of the work.</p> <p>Scope of the study: The tenderer shall comment on the study topics mentioned in the requirements specification and, if applicable, point out other topics that may be important to include.</p> <p>Organisation: The tenderer shall specify the planned organisation of resources, progress, and cooperation with the client. The expertise of the resources offered shall be linked to the implementation.</p>

1. Rethink and design for reuse

When constructing a new building or renovating an existing building, the highest value circular options both for reducing the amount of plastic and plastic/construction waste is done at the architectural design phase. Below the contracting authority will find a selection of measures that should be considered.

- Investigate waste data from other construction projects in your organization. Set goals for benchmark and reference values for construction waste that you can use in the contract and tender negotiations.
Focus on making benchmark values for selected building categories like schools, multi-purpose halls, or kindergartens.
- Avoid embedded plastic components that hinder future disassembly unless they deliver net lifecycle benefits. Require that LCA-documentation of net lifecycle-benefits be given when such components are used.
- Where plastic is used, consider if it can be used so that it can be retrieved for future reuse or recycling of material.
- Require or investigate potential for design for disassembly and reusability (fasteners, modular assemblies, accessible components, structural elements).
- Require modular elements



Below you will find requirement specification that can be used to secure construction for adaptability and reuse. This requirement can be used when you are in stages 3, 4, 5 and 6 of the construction process. The stages follow **NS3467***.

Wording of requirement

The supplier shall investigate how it is possible to facilitate an adaptable building and reuse of materials after the end of the useful life of the building and materials. Relevant measures shall be implemented in the design.

The following elements shall be included in the investigation as a minimum.

- a. Adaptable buildings
- b. Correct service life of components
- c. Flexible connections
- d. Labelling of materials and components for reuse
- e. Sources of substances harmful to health and the environment that reduce future reuse
- f. Homogeneous materials
- g. Sensible layering

The investigation shall be carried out in the preliminary project and further detailed in the detailed project. For each topic in the table to be investigated, measures and how these can be carried out and implemented in the building shall be stated. Relevant measures shall be implemented in the design. If proposed measures have a significant impact on costs or progress, this shall be mentioned in the investigation.

2. Reduce - market dialogue on reduction of construction waste and packaging for materials made from plastic.

The next step will be to reduce plastic materials and plastic packaging from parts of the construction and reducing/minimizing the amount of construction waste and plastic waste.

- Make market inquiries with potential contractors prior to the tender to assess market readiness for circular plastic solutions and the potential for reduction of construction waste.
- Use the market inquiries as a basis for deciding whether to use minimum requirements and requirement specifications for the circular aspects or using award criteria and bonus/malus to award bidders offering the desired solutions



Question	Suggested follow-up actions
<p>Can you deliver parts of the construction materials, like ventilation shafts and windows, with reduced packaging or plastic casing and still preserve the functionality of the materials?</p> <p>If yes, which?</p>	<p>If three or more responses of yes – use the following wording:</p> <p>“The contractor shall present a list of measures of delivery of materials with reduced amount of packaging and expected impact of the measures.</p> <p>The contractor shall describe how the functionality of the materials will be preserved.”</p>
<p>Can you reduce the amount of plastic film used for packaging and still preserve the functionality of the materials?</p> <p>Can you reduce the amount of plastic and material used for packaging covers for modules brought to the construction site and still preserve the functionality of the materials?</p>	<p>If there are three or more responses of yes, employ minimum requirements.</p> <p>For minimum requirements use for instance the example “Minimum requirement – waste reduction,” see table below</p> <p>If you get fewer than three yes or more inconclusive responses, consider using an award criterion or a bonus, see suggested example in the table “award criterion/bonus for achieved waste reduction targets”</p>

Minimum requirement – waste reduction

Requirement specification	Verification requirements
<p>Waste minimization shall be a topic from design to completion. Together with a waste plan, the contractor shall prepare and submit a list of waste reduction and plastic waste reduction measures to be implemented in the project to the contracting authority.</p>	<p>Submission of a waste management plan to appendix x of the waste plan</p> <p>The measures described in the implementation plan shall be documented in the monthly reports</p> <p>The measures to reduce plastic packaging for construction</p>



<p>The list shall be delivered x number of weeks before construction starts.</p> <p>The target for the measures shall be a maximum of x kg/m² of construction waste/gross floor area (excluding demolition waste). “</p>	<p>materials will be documented in the waste management plan and the environmental monitoring plan</p>
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Award criterion/bonus for achieved waste reduction targets:

Wording of criterion/bonus	Verification requirements
<p>The contractor will be awarded a bonus of x Euro for achieved waste reduction targets beyond the minimum requirement.</p>	<p>Submitted plan to appendix of the waste management plan. The waste minimization measures shall be documented in monthly waste reports.</p>

4. Reusable solutions and take-back schemes

The next step will be to require reusable solutions and arrangements that are part of a reuse and take-back scheme, both for packaging and selected materials brought to the construction site. Conduct market inquiries ahead of making the tender to assess market readiness and choice of requirements or award criteria/bonuses for the contract depending on the responses given in the market inquiries.

Question	Suggested action and minimum requirements
<p>Return/takeback schemes</p> <p>Can you provide return schemes or takeback schemes on pallets, gypsum, roof felt and other materials?</p> <p>If yes, which?</p>	<p>If three or more responses of yes –</p> <p>make minimum requirements for the specified materials. Use for instance the wording below:</p> <p>“The contractor shall provide return schemes/takeback schemes for the following materials (specify).</p> <p>A list of takeback and return schemes shall be delivered as part of the waste management plan”</p> <p>Verification requirement:</p> <p>Receipt and documentation of agreement from an approved waste company.</p>



<p>Reusable packaging</p> <p>Can you employ reusable packaging for temporary plastic coverings on the construction site (for instance tarpaulins, crates)?</p> <p>If yes, specify which flows and under which terms.</p>	<p>If at least three responses of yes in the market inquiries: make requirements for reusable plastic packaging for the selected temporary plastic coverings, for instance using this wording:</p> <p>“Plastic packaging used for materials and the construction site should to the greatest extent possible be reusable. All temporary plastic coverings on the construction site (e.g. tarpaulins) must be part of a documented, verifiable reuse scheme”</p> <p>Verification requirement:</p> <p>“The bidder shall present a specification on which construction elements where reusable packaging will be employed.</p> <p>Product declaration or written confirmation of reusability of the specified packaging from the packaging provider”</p> <p>Contractual follow-up:</p> <p>The construction elements delivered with reusable packaging and the quantity of reusable packaging shall be documented as part of the monthly waste management reports.</p>
<p>Other plastic packaging takeback schemes</p> <p>Can you provide takeback and return agreements on other plastic packaging used on the construction site?</p> <p>What kind of construction materials can you offer this for? Under which terms?</p>	<p>If you get at least three responses of yes, consider making it a minimum requirement to provide return/ take back agreements on plastic packaging used on the construction site.</p> <p>Suggested wording of minimum requirement:</p> <p>“The bidder shall as a part of the waste management plan present return or take back-agreements on plastic packaging used on the construction site for the following applications/materials (specify which)”</p> <p>Verification requirement:</p> <p>“Specification of take-back arrangements for plastic packaging in the waste management plan.</p>



	<p>Receipt and documentation of agreement from an approved waste management company”</p> <p>If responses are inconclusive or negative, consider if you can award the tenderers on their ability to provide takeback and return agreements on plastic packaging, or proceed to next step, part 5</p>
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5. Make requirements on recycling and prepare for recyclability of materials

The next step would be for the contracting authority to make market inquiries to assess market readiness for the recyclability of the plastic materials and the plastic packaging. Use the responses from the market inquiries to decide whether you can make minimum requirements that increase the amount of recycled plastic in the plastic materials used or increase the quantity and share of recyclable plastic material as part of the elements and materials used for the building.

Criteria to increase recycled content for specific plastic materials at the construction site as well as promoting the recyclability of selected plastic materials used at the construction site can be found in the separate checklist – **criteria to promote recycling of plastics at the construction site**.

[Checklist - criteria to promote the recycling of plastics at the construction site.docx](#)

Question	Suggested follow-up actions
<p>Are the plastic components of protective film plastics employed in this contract recyclable?</p> <p>With protective film plastics we refer to plastic sheeting polyethylene (PE) plastics and stretch and shrink plastic sheeting (PE-HD, PE-LD, and PE-LLD) used in construction for indoor protection</p> <p>What kind of documentation can you offer on the recyclability of the plastic packaging?</p>	<p>If you get at least three responses of yes, consider making it a minimum requirement that the plastic materials of the relevant kinds of protective film plastics are recyclable</p> <p>Use this minimum requirement formula, dependent on responses:</p> <p>“x% plastic material in plastic sheets protective film plastics (PE), and stretch and shrink plastic sheeting (PE, HD, PE-LD an PE-LLD) used for indoor protection must as a minimum be recyclable. ”</p> <p>Verification requirements:</p> <p>Product sheet or declaration or third-party certification (EUCert, Recyclclass,</p>



	<p>EPDs) documenting the material the plastic made from and confirming that the plastic materials meet the requirements and are recyclable.</p> <p>If responses are more inconclusive, consider using an award criterion for the offer of recyclable plastic sheet protective film packaging (PE) and shrink plastic sheeting (PE, HD, PE-LD an PE-LLD) used for indoor protection with the highest amount of recyclable content.</p>
<p>Separate sorting of film plastics Can you offer separate sorting of plastic films as a part of the waste handling solution for this tender? Film plastics refer to polyethylene-based (PE) plastics and stretch and shrink film plastics (PE-HD, PE-LD, and PE-LLD) that are used in the construction supply chain and in construction for packaging and internal protection</p>	<p>Depending on the responses in the market inquiry, consider if you can make a minimum requirement for separate sorting of plastic fractions for packaging.</p> <p>Verification requirements: A list of plastic waste fractions offered for separate sorting for material recycling from the construction site will be attached as part of the waste management plan.</p> <p>Contractual follow-up: Specification of plastic waste fractions separately sorted and the quantities for each waste fraction shall be documented as part of monthly waste reports.</p>



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