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2.7 Environmental Management Plan Annex B8 Materials Management Plan

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2.7 ENVIRONMENTAL MANAGEMENT PLAN ANNEX B8 MATERIALS MANAGEMENT PLAN

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B8 Materials Management Plan

B8.1 Introduction

Purpose

B8.1.1 This document forms Annex B8 of the Environmental Management Plan (EMP) (Application Document 2.7) and represents the extended essay plan Materials Management Plan (MMP) for the A66 Northern Trans-Pennine Project (the Project). The MMP will describe how material resources will be managed in compliance with best practice requirements.

B8.1.2 The purpose of the MMP is to outline the procedures to be followed to manage material resources during the construction of the Project. This includes re-use and handling of site won materials which are required to be managed in accordance with Contaminated Land: Applications in Real Environments (CL:AIRE) code of practice[1]. The MMP is considered a live document and as it evolves it will be used to demonstrate how the Principal Contractors (PC) are adhering to the Definition of Waste: Code of Practice (DoW:COP)[2].

B8.1.3 The PC will use the MMP to ensure materials are handled efficiently and managed appropriately. Procedures will be adopted by the PC during construction to control the use of materials and manage the construction impact of material use. A DoW:COP verification report will be produced to ensure compliance with the MMP and record material use.

B8.1.4 This MMP been produced to act as a live document and will be populated and used as a framework for further use by the roles outlined in Table 1: MMP roles and as the detailed design evolves. It will be updated alongside and as part of the EMP.

B8.1.5 A Site Waste Management Plan (SWMP) is also provided as Annex B2 of the Environmental Management Plan (Application Document 2.7) which describes how waste will be managed in line with best practice requirements, and will be implemented alongside and in conjunction with this MMP.

Structure of the materials management plan

B8.1.6 This MMP includes:

- Section 1: introduces and describes the purpose of this document and provides the roles and responsibilities required for its implementation
- Section 2: will detail the estimated quantities of earthworks and material assets required for construction

[1] CL:AIRE. The Definition of Waste: Development Industry Code of Practice. Version 2. March 2011.
Available at: [redacted]
[2] The Waste (England and Wales) Regulations 2011

- Section 3: will outline the process for assessing materials to confirm they are suitable for use in the Project
- Section 4: will specify the procedures for managing and tracking materials.

Project team roles and responsibilities

B8.1.7 Exact roles and responsibilities regarding materials management procedures will be confirmed by the PC as detailed design is progressed. However, likely key roles and responsibilities are summarised in Table 1: MMP roles and

Table 1: MMP roles and responsibilities

Role	Responsibility
PC Project Manager	• Sign off of the MMP for the relevant phase of works • Ensure that all controls specified within the MMP are implemented by employees and sub-contractors • Ensure overall project compliance with relevant waste and materials management legislation
PC Environmental Manager	• Undertake inspections to monitor adherence with the environmental licenses and consents for the works and compliance with measures in the MMP • Manage the Project compliance with all relevant environmental legislation, consents, objectives, targets and commitments, including those arising from the ES. To include monitoring of waste operators and haulage contractors compliance with waste transfer legislation
PC Site Materials and Waste Manager	• Responsible for ensuring that all materials and waste elements of the EMP are complied with during construction • Managing and maintaining mandatory documentation as required by legislation • Updating the MMP • Responsible for implementing the MMP throughout the construction of the Project
Suitable Qualified Person registered under CL:AIRE	• Responsible for the review and Declaration of the MMP • Ensures that the evidence relating to the proposed use of materials is compliant with the CL:AIRE Definition of Waste: Code of Practice. • Once the Declaration is submitted the role of the QP is finished

Design decisions

B8.1.8 Decisions made as the detailed design of the Project is evolved will impact on the quantity and quality of materials used for construction.

B8.1.9 This section will outline the principles and measures to be implemented during design and construction. Where technically, financially and environmentally practicable these should include:

- Designing out and preventing waste arising
- Re-using excavated earthworks within each scheme and across the Project

- Recycling demolition materials that arise from construction
- Diverting unwanted material from landfill through offsite recycling and recovery
- Use recycled and secondary materials in the construction of the scheme.

B8.1.10 The design of the Project has aimed to balance 'cut and fill' requirements as far as practicable and these requirements should continue to be prioritised as detailed design progresses.

B8.1.11 Details will be included on the earthworks strategy and individual schemes designed to allow for materials excavated on-site to be re-used on areas of the site where materials are required, to minimise the amount of off-site materials required.

B8.1.12 During the detailed design stage and construction of the scheme, the PC will make decisions to prioritise efficient material resource use and management and record those decisions appropriately as described in Section 4 of this MMP.

B8.2 Estimate of material resources and earthworks

Overview

B8.2.1 This MMP provides estimates of:

- The types and quantities of materials required for the construction of the Project, on a scheme-by scheme basis
- The types and quantities of earthworks materials arising during construction of the Project, and the likely cut and fill balance and surplus on a scheme-by-scheme basis.

B8.2.2 The PC will review, update and monitor these estimates throughout detailed design and construction phases, ensuring they are incorporated into the MMP during Project delivery.

B8.2.3 The PC will update the final MMP to reflect current legal requirements and waste management practices of the Project as necessary. The PC will ensure all required authorisations are obtained, kept on file and obligations under any licences obtained are fully implemented. They will ensure appropriate training of site staff is carried out regarding legislative requirements and will monitor compliance with relevant licences and authorisations.

Material resources

B8.2.4 The main types and quantities of construction materials required for the construction of the scheme have been estimated based on the preliminary design and are outlined in Table 2: Estimated material assets required below. These estimates will be updated by the PC once the detailed design is complete. The PC will adopt good practice approaches to maximise the recycled content of material used in the scheme.

B8.2.5 Materials will be imported for construction of the scheme, including pavement, concrete and manufactured products. The regional recycled aggregates target, outlined in Design Manual for Roads and Bridges (DMRB) LA 110 Material assets and waste standards will be complied with for materials sourcing. Where a project is located in more than one region, the highest regional target is adopted (in this case a target of at least 31% recycled content, reflecting the target set by the Yorkshire and The Humber region).

B8.2.6 The PC will ensure that re-used, recycled and secondary aggregates imported to site comply with all relevant technical and regulatory requirements. Imported aggregates, asphalt, concrete and manufactured products will be sourced locally, where possible. All records and certificates from suppliers shall be kept and maintained for evidence and will be required for the verification report and operation and maintenance files.

B8.2.7 The exact sources of material for the project are not yet confirmed, though it is expected that:

- Manufactured products (e.g. road restraint systems, traffic signs, lighting, drainage) would be sourced from local or national suppliers dependent on the material required (opportunities for reuse from the upgraded road will be sought but are likely to be limited due to the nature of the products and due to large sections of the existing A66 being retained and de-trunked as part of the local road network)
- Earthworks material, including earth embankments and earth bunds, would be sourced from material won on-site
- Pavement materials will re-use won materials on site where possible, however if not suitable or due to programme requirements, material would be sourced from suppliers as local to the scheme as possible
- Structures and concrete based elements of the scheme would be via local batching plants or pre-cast off site and imported. The majority of precast factories in the UK are located in the Midlands, though closer locations will be sought if available
- Steel components are likely to be sourced from a national supplier.

Table 2: Estimated material assets required

Material	Unit	Quantity								
		Route wide	M6 J40 to Kemplay Bank	Penrith to Temple Sowerby	Temple Sowerby to Appleby	Appleby to Brough	Bowes Bypass	Cross Lanes to Rokeby	Stephen Bank to Carkin Moor	A1 (M) Junction 53 Scotch Corner
Fencing and Barriers										
Fencing	metres	101,545	6,127	19,222	17,200	16,076	9,500	14,000	19,360	60
Noise barriers [3]	metres	14,408	2,496	5,773	95	335	300	2,250	3,159	0
Road restraint system - single sided	metres	45,048	7,564	5,431	4,300	4,019	8,533	6,600	8,601	0
Road restraint system - double sided	metres	36,621	1,604	5,237	8,600	8,038	4,266	4,250	4,626	0
Street Furniture										
Traffic signs	m^2	2,902	442	291	843	56	310	500	460	0
Road lighting and columns - LED lights	no.	75	55	0	0	0	20	0	0	0
Road lighting and columns - Steel columns	no.	57	55	0	0	0	0	0	0	2
Marker posts/signs	no.	360	16	52	86	80	29	42	50	4
Road studs	no.	21,124	1,116	2,360	5,733	5,358	1,305	1,885	3,367	0
Drainage										
Plastic pipework total HDPE	metres	124,587	8,239	16,921	25,932	24,417	14,298	15,260	19,520	0

[3] The assessment is based on early design iteration which included a conservative approach to noise barriers that assumed large scale use across the Project. The emerging design has much reduced the deployment of noise barriers. However a conservative approach has been taken to assume the preliminary scale deployment of noise barriers despite the minor over-estimation of these materials.

Material	Unit	Quantity								
		Route wide	M6 J40 to Kemplay Bank	Penrith to Temple Sowerby	Temple Sowerby to Appleby	Appleby to Brough	Bowes Bypass	Cross Lanes to Rokeby	Stephen Bank to Carkin Moor	A1 (M) Junction 53 Scotch Corner
Total Precast concrete circular pipework	metres	1,712	1,553	159	0	0	0	0	0	0
Precast concrete box culvert	metres	2,735	0	55	437	841	149	646	607	0
Total Precast concrete manholes	no.	2,580	190	289	576	543	333	303	346	0
Gullies	no.	362	32	48	86	81	30	35	50	0
Channels	metres	68,954	2,550	9,904	17,288	16,278	6,000	7,000	9,934	0
Damp proof course and impermeable membrane	m^2	245,545	4,350	17,842	61,152	83,039	15,724	20,103	43,335	0
Concrete	m^3	159	44	115	0	0	0	0	0	0
Fill, aggregate and sand	tonnes	8,571	3,371	5,200	0	0	0	0	0	0
Road Pavement										
Kerbs - Total pre-cast concrete	metres	40,871	16,066	23,987	0	0	0	0	625	193
Thermoplastic road marking	tonnes	100	15	10	0	0	18	26	40	1
Asphalt	tonnes	782,750	94,470	104,880	160,302	173,304	46,141	84,541	118,046	1,066
Fill, aggregate and sand	tonnes	912,377	101,632	112,832	190,336	203,154	52,067	97,524	154,680	151
Structures										
High friction surfacing	m^2			0	0	0	0	1,800	0	

Material	Unit	Quantity								
		Route wide	M6 J40 to Kemplay Bank	Penrith to Temple Sowerby	Temple Sowerby to Appleby	Appleby to Brough	Bowes Bypass	Cross Lanes to Rokeby	Stephen Bank to Carkin Moor	A1 (M) Junction 53 Scotch Corner
In-situ concrete piles	tonnes	2,025	2,025	0	0	0	0	0	0	0
Steel sheet piles	tonnes	190	0	0	0	0	0	90	100	0
General steel	tonnes	4,648	0	399	0	4,179	0	0	70	0
Galvanised steel	tonnes	1,399	1,280	0	0	0	35	52	33	0
General precast concrete	tonnes	11,139	2,830	2,336	3,253	0	1,250	586	884	0
High strength precast concrete	tonnes	10,095	1,423	780	0	6,133	1,092	667	0	0
General concrete C40/50	m^3	22,731	1,774	897	3,094	14,464	769	958	776	0
General concrete C6/8 (Gen 0, ST1)	m^3	246	0	0	0	0	246	0	0	0
Steel bar and rod	tonnes	4,148	269	253	1,082	1,919	251	195	179	0
General asphalt	tonnes	1,960	448	233	0	0	617	451	212	0
Fill, aggregate and sand general mixture	tonnes	14,312	0	0	0	0	8,653	5,659	0	0

Earthworks balance

B8.2.8 The Project has been designed to reduce the quantity of imported construction materials, alongside reducing the quantities of waste taken off-site by re-using or recycling the available existing materials.

B8.2.9 The Project comprises eight individual schemes that will likely be delivered at different times and across a large geographic area. Each scheme will have a cut/fill balance resulting in generation of materials for use within the Project. The design has sought to achieve a balance of cut and fill at individual scheme, package and project level as far as is practicable, taking into account the complexity of the phasing of delivery.

B8.2.10 The Earthworks volume estimations set out in Table 3: Earthworks estimates have been calculated based on the current preliminary design in volume (cubic metres) and have therefore been converted to mass (tonnes) using the Environment Agency conversion factor of 1.5 tonnes per cubic metre used for inert materials.

B8.2.11 Where cut and fill balance at scheme level is not possible the intention is for excess materials to be utilised within other schemes as part of the Project, with the aim of achieving an overall balance, where possible. This will depend on the scheduling and timing of the construction of each scheme and the nature of the materials available.

B8.2.12 Cut and fill balances have been reviewed for each of the schemes with the majority having sufficient permanent or temporary land to retain material arisings in dedicated and functional landscape bunds. However, it is likely that excess material from two schemes - M6 Junction 40 to Kemplay Bank and Temple Sowerby to Appleby schemes - will be transported to the Penrith to Temple Sowerby scheme for final placement in landscaping areas. Based on the current cut and fill assessments for each project, it is unlikely that imported material will be brought into any part of the Project.

B8.2.13 Dependent on construction phasing, there may be a requirement to form borrow pits on the M6 Junction 40 to Kemplay Bank and Penrith to Temple Sowerby schemes to enable early embankment works to progress, but this material deficit will be replenished as part of the main cut and fill activities. Due to the nature of constructing a wider road, there is also additional topsoil on most schemes, thus is also unlikely that any additional topsoil will be required, with the Bowes Bypass, Cross Lanes to Rokeby and Stephen Bank to Carkin Moor schemes experiencing significant volumes of topsoil due to the geological topography.

B8.2.14 The Project will achieve a minimum of 90% recovery of non-hazardous construction waste, as per the DMRB LA 110 target. The Ground Investigation undertaken to date has indicated good quality materials for re-use therefore it is expected the Project will exceed this rate.

Table 3: Earthworks estimates

Scheme	Usable Cut (m^3)	Fill (m^3)	Earthworks Balance (m^3)	Unsuitable Materials (m^3)	Scheme Balance (m^3)	Usable Cut (tonnes)	Fill (tonnes)	Earthworks Balance (tonnes)	Unsuitable Materials (tonnes)	Scheme Balance (tonnes)
M6 Junction 40 to Kemplay Bank	179,500	104,600	74,900	14,500	89,400	269,250	156,900	112,350	21,750	134,100
Penrith to Temple Sowerby	214,500	464,000	-249,500	19,000	-230,500	321,750	696,000	-374,250	28,500	-345,750
Temple Sowerby to Appleby	1,530,500	1,475,000	55,500	124,000	179,500	2,295,750	2,212,500	83,250	186,000	269,250
Appleby to Brough	1,044,000	602,500	441,500	85,000	526,500	1,566,000	903,750	662,250	127,500	789,750
Bowes Bypass	95,400	172,000	-76,600	9,700	-66,900	143,100	258,000	-114,900	14,550	-100,350
Cross Lanes to Rokeby	108,500	250,000	-141,500	11,000	-130,500	162,750	375,000	-212,250	16,500	-195,750
Stephen Bank to Carkin Moor	549,500	415,600	133,900	45,000	178,900	824,250	623,400	200,850	67,500	268,350
A1(M) Junction 53 Scotch Corner	0	0	0	0	0	0	0	0	0	0
Project wide	3,721,900	3,483,700	238,200	308,200	546,400	5,582,850	5,225,550	357,300	462,300	819,600

B8.3 Evaluating materials

Classification of materials

B8.3.1 This section will detail the specifications for suitable materials to be used in construction, in accordance with the Specification for Highway Works[4]. This will be developed by the PC and, where appropriate, testing should be undertaken during construction to confirm that the material assets meet the specification requirements.

B8.3.2 In the event of off-site disposal in relation to site won materials, the material will be characterised in accordance with the Environment Agency's Technical Guidance WM34 (Highways England, 2022)[5]. The management of such waste will be regulated by the SWMP (Annex B2 of this draft Environmental Management Plan) and relevant waste management legislation.

B8.3.3 Materials will be re-used as far as practicable on-site, with re-used materials classified in accordance with the Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 600 Earthworks[6]. Materials which do not meet the classification will be disposed of appropriately.

Land contamination

B8.3.4 Unacceptable materials may be encountered during construction works due to contamination. Potential contamination sources have been identified in the Environmental Statement and are shown on Figure 9.5: Potential contamination sources (Application Document 3.3). Known areas of land contamination concern are detailed in full in Environmental Statement Chapter 9: Geology and Soils (Application Document 3.2). In addition, there is potential for unexpected contamination to be encountered during construction.

Known areas of contamination

B8.3.5 This section will set out the procedures to be followed regarding known areas of land contamination concern to confirm the risks, identify and delineate the sources and quantify risks to receptors. This is likely to include a Tier 3: Detailed Quantitative Risk Assessment and associated remediation strategy where required. This will be produced as part of the detailed design stage, prior to construction, following detailed Ground Investigation.

B8.3.6 Remediation works should be undertaken during construction followed by a verification process set out in a remediation implementation and verification plan. On completion of the works, a verification report will be

[4] Highways England (2022) Manual of Contract Documents for Highway Works Volume 1 - Specification for Highway Works.
[5] Environment Agency (2018) Waste Classification: Guidance on the classification and assessment of waste (1st Edition v1.1) Technical Guidance WM3
[6] Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 600 Earthworks

prepared. The remediation strategy, remediation implementation and verification plan and verification report will form part of the later iterations of the MMP and allow appropriate classification and management of contaminated materials.

Unexpected contamination

B8.3.7 This section will additionally set out the procedures to be followed for unexpected contamination. This is likely to include adoption of a watching brief to allow for appropriate management of contaminated materials to limit the risk to human health, controlled waters and allow for containment of contamination.

B8.3.8 In response to the watching brief, an action plan would be developed to set out procedures and responsibilities and form part of the MMP. This section will detail minimum requirements of the action plan in liaison with a suitably qualified land contamination specialist.

B8.4 Materials management on site

Materials storage and segregation options

B8.4.1 This section will detail the storage of excavated, demolition and construction materials and the processes for their segregation in the instances of re-use on-site.

B8.4.2 The PC will store excavated soils and earthworks on-site in designed and managed stockpiles until further required.

B8.4.3 Demolition materials that are to be recycled for use onsite shall be separated at source and stored separately both before and after the recycling process.

B8.4.4 Construction materials that are stored on site shall be in designated areas that are flat, accessible and secure in order to avoid damage or loss. Materials should be stored in appropriate conditions to avoid damage through, for example, water ingress, or vermin. Materials should be retained in their original packaging to protect them from damage.

B8.4.5 Construction materials, including stockpiled material, should be stored away from known below ground and overhead services to mitigate the risk of services strikes occurring or services being damaged. Materials shall be managed appropriately to avoid impacts to the environment and to the quality of the stored material.

Reporting and auditing

B8.4.6 The effectiveness of the MMP and its future iterations is dependent on its enforcement on site by the nominated PC environmental manager and site materials and waste manager.

B8.4.7 The PC will maintain a record of all materials that come to site. The materials shall be stored in a designated location, the date and location of which shall be recorded and maintained through the construction phase. The quantity of re-used, recycled and secondary aggregate

should be recorded, alongside details of the supplier, the producing facility and records that demonstrate that the material meets all relevant technical and regulatory requirements.

B8.4.8 A template for recording materials that come to site which details their quantities, specifications and suppliers should be included by the PC in this section.

B8.4.9 The PC shall continually review the types of surplus materials being produced and amend the site set up to minimise wastage rates and maximise reuse or recycling.

Materials movement and tracking

B8.4.10 This section will outline an appropriate tracking system to be put in place for the movement of materials within the site and between other development sites, where relevant. This is essential to provide an auditable trail of materials movements.

B8.4.11 The tracking system should include:

- Annotated plans of the site identifying excavation areas, stockpile locations, any treatment areas and placement locations
- Inspection and testing procedures to verify materials are as anticipated from the site investigation information
- Registered waste carrier and non- waste haulier
- Tracking forms and control sheets to record the movement of materials, including delivery tickets if materials are moving between sites
- Treatment results (if applicable)
- Delivery tickets for non-waste materials (if moving from one site to another)
- Acceptance and testing procedures if materials are moving between sites.

Review and evolution of the MMP

B8.4.12 The PC will update the MMP in the event of significant changes to the type or quantities of materials required for construction. The PC shall commit to review the MMP every six months during construction to ensure targets are being achieved.

Site inspections

B8.4.13 The site manager or nominated deputy shall undertake a daily inspection of the construction areas including all areas used for materials management. Any issues shall be recorded in the daily log along with any corrective action taken.

Training

B8.4.14 This section will detail how the requirements of the MMP will be incorporated into site induction and on-site training on the appropriate

separation, handling recycling, re-use and return methods to be used by all parties.

Best practice measures

B8.4.15 The PC will apply the principles of circular economy to ensure best practice on site and to achieve high levels of sustainability for the Project.

B8.4.16 The PC will go beyond statutory compliance with best practice measures set out in construction industry guidance to reduce the potential impacts from material resources. This may include, for example, guidance from the Crown Commercial Services, Waste & Resources Action Programme and CIRIA.

B8.4.17 The contractor would adopt good practice in construction material resources management. The following approaches shall be implemented, where practicable, to manage material resources:

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme
- Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which can increase the risk of damage and subsequent disposal as waste
- Attention to material quantity requirements to avoid over-ordering and the generation of waste materials due to surplus
- Re-use of materials onsite wherever feasible, e.g. re-use of excavated soil for landscaping, recycling of demolition materials into aggregates
- The materials would be sorted or processed and where necessary, treated
- Where materials excavated on-site are initially unable to meet the re-use criteria, they would either be treated to make them suitable for use or, as a last resort, disposed off-site as waste
- Offsite prefabrication, where practical, including the use of prefabricated structural elements
- Offsite re-use, recycling and recovery of materials where re-use onsite is not practical, e.g. through use of an offsite waste segregation or treatment facility or for direct re-use or reprocessing offsite.

Supporting documentation

B8.4.18 The following lists the expected supporting documentation requirements to support the completion of the full MMP for the Project (in addition to information requirements for the plan itself as specified above):

- Invasive Non-Native Species Management Plan (essay plan included as Annex B16 of this EMP)
- Site Waste Management Plan (included as Annex B2 of this EMP)
- Earthworks Strategy
- Soils Management Plan (essay plan included as Annex B9 of this EMP).