MINISTRY OF DEFENCE

DIO Secretariat - SD Policy

SUSTAINABLE DEVELOPMENT MINIMUM STANDARDS: Core Works

Practitioner Guide - 01/11

Document Aim:

This practitioner guide sets out the minimum and best practice estate sustainable development (SD) standards that MOD project teams should apply when delivering capital works to meet sustainability objectives. This will secure both long term operational output and long-term value for money for the Department.

The document provides the user with a simple cascade approach. It sets out the MOD objectives and high level Government targets for each area. It then provides the minimum sustainability standards to be applied in each area and highlights the best practice. Each section is supported by practical guidance and an example of where and how the standards have been applied across the estate.

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Contact if different from above Sponsor: Louise Allan – DIO StratPol-SD Energy 1d – 01225 884142	
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24 Mar	1.1	LA	Re-title. Change in team names.

Contents

Legend

Each subject section comprises the following elements:

MOD Objectives This section highlights the key MOD objectives for the subject area, as defined in the MOD Sustainable Development Strategy, the Annual SD Report & Action Plan and Defence Infrastructure Organisation policies.	
Government Targets This section outlines the mandatory Government targets relating to the subject area. A full set of the Greening Government[1] targets is provided at Annex A.	
You Must….. These boxes provide the Sustainable Development Minimum Standards (i.e statutory and mandatory policy requirements) that must be applied. These relate to the Policies listed in the 'Find Out More…' section.	
Best Practice This section outlines the aspirations that projects should seek to achieve to meet best practice.	
Practical Guidance These boxes provide hints and tips for complying with Sustainable Development Minimum Standards.	
Case Studies Generic examples have been used to illustrate the recommended approach within the guidance. These examples have been drawn from real MOD projects to aid their interpretation.	
Find Out More… This section provides a list of sources of further information and who to contact for advice.	

[1] *Greening Government Commitments: Operations and Procurement*, launched by Defra on 28 Feb 2011

Introduction

Government policy and legislation now requires that sustainable development is at the heart of all construction projects across the public sector. But there are also clear business benefits relating to through-life financial savings, an improved working environment for the defence community and achieving long-term value for money as we build, maintain and operate defence facilities.

Many organisations in both the public and private sectors are finding that 'greener' property can lead to lower running costs, reduced environmental legal risks, greater occupier satisfaction (through better working environments) and significant reputational benefits. Better, more environmentally responsible choices made in design and the types of materials that we put into our buildings are central to reducing the environmental impact of defence and will ensure that MOD is playing its part in meeting long term sustainability objectives.

This document aims to help MOD estate practitioners and our suppliers by setting clear minimum sustainability standards that should be applied across all estate core works projects. This includes all Core Works activity and Core Service Projects as defined in JSP 435.

In advance of agreeing the specification for a core work the following minimum actions must be taken:

- The customer must ensure that sustainable development is a Key User Requirement. Sustainable outcomes need to be driven by a requirement from the start.
- Ensure that robust whole life costing is applied in considering options. This must include looking at realistic through life operating costs (e.g. maintenance and utility consumption).
- Include sustainable development within all business cases. Investment Approvals Board (IAB) and Top Level Budget (TLB) approvals policy now requires that Sustainable development be included with the Initial and Main Gate Business Case.
- Project Team staff must ensure that SD is addressed appropriately in Pre-Qualification Questionnaire (PQQ) and Invitation To Tender (ITT) stages.
- Project Team and customers must give appropriate weight to sustainability when evaluating tenders and solutions depending on the scale of SD risks and opportunities.

Building Regulations

The Building Regulations set standards for design and construction of buildings, mainly to ensure the safety and health for people in or around those buildings, but also for energy conservation and access to and around buildings. All MOD projects must be delivered in line with Building Regulations and this is the **statutory requirement**.

Part L of the Building Regulations implements the energy performance of buildings directive in England and Wales and deals with the conservation of heat and power in buildings. Changes to Part L of the Building Regulations come into force in Oct 2010. Please liaise with the Local Planning Authority to understand the requirements necessary for core works projects. For further advice contact the DIO Building standards Principle Buildings Surveyor 94421 2135, or Planning Portal.

Planning Policy Statements

Planning Policy Guidance Notes (PPGs) and their replacements Planning Policy Statements (PPSs) are prepared by the government after public consultation to explain statutory provisions and provide guidance to local authorities and others on planning policy and the operation of the planning system.

They also explain the relationship between planning policies and other policies which have an important bearing on issues of development and land use.

The MOD is subject to Planning Policy Statements and must adhere to them if requested by the Local Planning Authority.

Further Guidance and Supporting Tools

These Standards cannot cover every aspect of Sustainable Construction. They focus on key standards for the main sustainability themes. Links are provided to additional guidance and tools and to more detailed information.

These Standards are part of a suite of guidance and tools that, as a whole, provide the policy and processes that will deliver Sustainable Construction. The following should be utilised in conjunction with these standards:

- The Sustainability and Environmental Appraisal Tool (SEAT) Handbook
- Defence Related Environmental Assessment Methodology (DREAM) or equivalent (Building Research Establishment Environmental Assessment Methodology (BREEAM)), Civil Engineering Environmental Quality Assessment (CEEQUAL)
- Design Excellence Evaluation Process (DEEP)
- Acquisition Operating Framework
- The Sustainable Procurement Practitioner Guide
- The Integrated Project Guide (IPG)
- Code for Sustainable Homes

Additional and specific information can be found in JSPs (434, 435, 362 507 and 418), DIO Policy Instructions, DIO practitioner guidance documents and at the various links found in this document.

Embedding SD in Construction on the Defence Estate

Sustainable Construction Overarching Principles:

- All projects must contribute to achieving MOD and Government SD objectives and targets.
- Building designs must meet operational and user requirements as well as being adaptable to future challenges including climate impacts and changes in user requirements.
- The HM Treasury Green Book should be used to ascertain the best solution (e.g. either refurbishment or new build).
- Building design, landscaping and use of sympathetic and sustainable materials from accredited sources should enhance the local environment and promote sustainable defence communities.
- Long-term value for money is achieved by incorporating a whole life cost approach.

These principles will be achieved by focusing on 8 key areas. The Desired Outcomes are:

Topic	Desired Outcome
Energy	Buildings that are innovatively designed to be energy efficient and low carbon, including maximising opportunities for renewable energy exploitation.
Water	The building is water efficient and incorporates water saving measures, and pollution and flood risks are managed during construction and operation. Water use is minimised during construction.
Construction Waste	Waste minimisation is considered early in the design process. It is then managed on site during construction, diverted from landfill and recovered for reuse or recycling. Provisions are made for effective waste management in the eventual building operation phase.
Biodiversity	Designated sites and natural habitats and species are protected, and efforts are made to enhance local biodiversity.
Heritage	Heritage assets are safeguarded and the design and construction of any new buildings, extensions or refurbishments is sympathetic to and where possible enhances the heritage value of the site
Climate Change Adaptation	Projects are adapted to the projected impacts of climatic change within the lifetime of the asset.
Sustainable Communities	Defence sites and buildings are places that meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life.
Sustainable Procurement (e.g. Materials & Products)	The most sustainable products and building materials are selected and derived from sustainable sources.

General Mandatory SD Requirements

There are a number of mandatory requirements that all Core Works projects must do:

Action	Policy	Guidance
• Undertake the appropriate levels of Sustainability Appraisal and environmental assessment	Secretary of State SHEF Policy 20 Sep 2010	SEAT Handbook
• Achieve a DREAM 'Excellent' rating for all new build and major refurbishments	DIO DREAM PI 06/11	DREAM User Guide
• All homes to be built to Level 3 of the Code for Sustainable Homes	CLG Policy	DIO Information Note 04/08
• Ensure components and fittings are compliant with Government Buying Standards minimum mandatory requirements	Defra policy	DIO PI 04/11
• Comply with Local Planning Authority policies/requirements.		
• Comply with UK and European legislation.		

Energy

Sustainable Development Minimum Standard: 1

Desired Outcome: Buildings that are innovatively designed to be energy efficient and low carbon including maximising opportunities for renewable energy exploitation.

MOD Objectives

- To be a leader amongst UK Government departments and Defence departments in EU and NATO States in the sustained reduction of CO_2 and other Green House Gases (GHG) emissions, such that defence will eventually not be a significant contributor to the causes of climate change.

Government Targets

- Reduce greenhouse gas emissions by 34% by 2020 from 1999/00 levels (Emission from: scope 1 (all owned or controlled emissions sources), 2 (the consumption of purchased energy), 3 (employee business travel);
- All Government Departments are to reduce carbon emissions in line with the Greening Government commitments.

You must…

- Achieve a building Energy Efficiency Rating of 'C' in respect to Energy Performance Certificates (EPC) and only install electrical appliances in line with the 'Government Buying Standards'.
- Install SMART meters in all new buildings and refurbishments (where meters are not already in place) and sub-meters for major areas of energy use.

Best Practice

- Build new houses to be carbon neutral (if delivered after 2013) and new buildings to be carbon neutral (if delivered after 2016).
- Install onsite renewable energy generation to at least comply with planning conditions (e.g. Merton Rule for 10% of the building's electricity to come from on-site renewable generation).
- Ensure an effective Building Energy Management System (BEMS) is installed and compatible with existing systems.
- Install at least one energy saving/low carbon measure based on the requirements of the building and site. (see '*Practical Guidance*').
- Ensure the contractor monitors and records the energy used during construction and reports to DIO PM.
- Exceed a building Energy Efficiency Rating of 'C'.

Practical Guidance

This section provides details on sustainable energy technology and should only be used as a **rough guide** of prices/deliverables; choice of appropriate technology may depend on detailed site conditions. Full investment appraisals will need to be carried out to ascertain the best solution for the project:

Hints and Tips

Combined Heat & Power		
Indicative Costs	Capital	£1,500 - £2,500 per kW
	Generation	6-8 pence per kWh
Lifetime		20 yrs +
Indicative Output	Payback time	3-7 years
	Capacity (annual energy yields)	Cost saving is made on cheaper gas cost than electricity cost. Higher overall efficiency.

Photovoltaic Solar Panels		
Indicative Costs	Capital	£5,000 - £8,000 per kW
	Generation	20-40 pence per kWh
Lifetime		20 yrs +
Indicative Output	Payback time	30-50 years
	Capacity (annual energy yields)	Approx 100 kWh per m^2 per year

Solar Thermal Panels		
Indicative Costs	Capital	£600 - £1,600 per kW
	Generation	4-10 pence per kWh
Lifetime		20 yrs
Indicative Output	Payback	8 -20 years
	Capacity (annual energy yields)	$4m^2$ collector produces 1,523 – 2,251 kWh per Y

Biomass Boiler		
Indicative Costs	Capital	£250-£1,000 per kW
	Generation	2-5 pence per kWh
Lifetime		20 yrs +
Indicative Output	Payback	5-10 years
	Capacity (annual energy yields)	'Oven dry basis' energy content of wood is approx 5 kWh per kg; in woodchip say 25% moisture converts to approx 3.7 kWh per kg

Note: Biomass Boilers have other associated costs and issues which will need investigating. These include, supply of the fuel (i.e woodchip etc), size and location of the fuel storage unit, maintenance and access for supplies.

Ground Source Heat (GSH) Pumps		
Indicative Costs	Capital	£700-£2,000 per kW
	Generation	4-10 pence per kWh
Lifetime		20 yrs +
Indicative Output	Payback	10-20 yrs payback time
	Capacity (annual energy yields)	100,000 kWh to 2,000,000 kWh NB: dependent on area and depth of boreholes NB: required power for pumping

Note: Ground source heating can be used to provide heat through the winter and assist with cooling during the summer. Of all the renewable technologies this is a very dependable source and can be incorporated in projects with confidence (but not always on cost grounds). To gain the maximum benefits from this technology consider low energy delivery systems in a building i.e. under floor heating not normal sized radiators and consider this early in the design stage as it can have a fundamental impact on the chosen construction.

Air Source Heat (ASH) Pumps		
Indicative Costs	Capital	£5,000 - £9,000
	Generation	4-5 kW per 1kW energy used
Lifetime		
Indicative Output	Payback	5-7 years

Wind Turbines		Micro	Intermediate	Large
Indicative Costs	Capital	£2,500-£3,500/kW	£950-£1,500/kW	£950/kW
	Generation	5-15 pence per kWh	4-6 pence per kWh	2-4 pence per kWh
Lifetime		10-20 yrs	15-25 yrs	25 yrs
Indicative Output	Payback time	10-30 yrs	8-15 yrs	4-8 yrs
	Capacity (annual energy yields)	1.5-25 kW of the order of 4,000-60,000 kWh	100-500 kW of the order of 170,000-1,000,000 kWh	600-3MW of the order of 1,300,000-6,000,000 kWh

*For application on the above and other renewable technologies please liaise with the relevant experts (see '*Useful Contact'* section) and ensure safeguarding is consulted**.**
Note: **These cannot be taken at face value and an Investment Appraisal is required in each case.**

DREAM

The Energy module within DREAM contains a section on '*Reduction of Carbon Emissions'* which has 6 credits if fully achieved. 26 credits in all can be achieved at the 'Design' stage of the Energy module; this will help in achieving the overall DREAM 'Excellent' rating. Please visit the DREAM website www.dreamassess.com for detailed information on how to be rewarded the necessary credits.
Note: To achieve DREAM 'Excellent' the project must achieve 'Excellent' at 'Build stage.

Energy Performance Certificate (EPC)

Meeting Part L of Building Regulations will ensure the building achieves a 'C' rating. To achieve an 'A' rating for an EPC the building must be energy efficient. Cavity wall insulation, loft insulation and efficient windows and doors will all help to achieve the highest rating (For further information visit the 'Sustainable Procurement (i.e *Materials and Products)'* Standard). Please read PI 08/09 (Energy Performance of Buildings Directive) for further information.

SMART Meters

The preferred specification for MOD sites is the **Code of Practice 5 Meter**. This meter should be **accurate to +/- 1%** and **read half hourly with day plus one**. This means that the information will be available to show how much energy is used every half an hour and the information will be available one day after it has been used. MOD has in place a central contract for smart metering, please refer to the Central Programme Office for Energy within DIO Strategy & Policy Directorate on **0121 311 2167**.

Building Energy Management Systems

Building Energy Management Systems are computer-based and are used to improve energy efficiency by monitoring building temperature inside and outside buildings and controlling the boilers and coolers for optimum efficiency.

Lighting

The Energy Savings Trust has a useful comparison of the energy saving lightbulbs available; these can be viewed at http://www.energysavingtrust.org.uk/.

Spend to Save funds

The MOD has established a central fund to support capital projects for carbon efficient solutions. In FY 07/08 and 08/09 a 'CDEL Fund' provided some £8.8M energy spend to save projects for 50 projects across the Department. Those projects are expected to save £2.8M from utility budgets and 21,600 tonnes of CO^2. The Central Programme Office for Energy manages central grants and coordinates applications to external sources of funding e.g. Salix. Please contact **0121 311 2167** for more details.

Case Studies

Case Study 1

RAF High Wycombe – Bunker Lighting

This case study provides an example of how changing light fittings can achieve significant savings through reduced running costs.

The operational nature of the facility required the lighting to be on 24 hours a day 356 days a year which amounts to a significant energy demand. The project required a total number of 2266 fittings ranging from 5ft T12 fittings to 4ft and 2ft Cat 2 T8 to be replaced. By changing the fittings and reducing the energy consumption of the bulbs the site was able to achieve large cost savings.

Summary

Cost of lighting installations - £291,734

Estimated Financial Saving - £42,691 PY

Estimated Emissions Savings - 318 tonnes

The overall Pay back period is 5.6 years.

RM Poole – Biomass Boiler

A 500kW-rated biomass boiler has been installed at RM Poole to serve the existing district heating installation at the site. The boiler runs on biomass woodchips and is expected to provide approximately 80% of the entire annual heat required by the district heating system.

Summary

Cost of Biomass Boiler - £117,957

Estimated Financial Savings - £43,892 PY

Estimated Emissions Savings – 1,204 tonnes

Estimated payback period is 5.2 years.

Note: *Both these case studies made use of the MOD CDEL Fund.*

Further Information

Policy	Link
JSP 418	Leaflet 17 – Utilities Management
Procuring buildings for the Government Estate in the top quartile of energy performance	DIO PI 08/10
Energy Performance of Buildings Directive	DIO PI 08/09
Communities and Local Government (CLG) - Planning Policy Statements on Energy and Building Regulations	**Website:** www.communities.gov.uk
Utilities - sub-metering of new and refurbished accommodation for monitoring and targeting - **Mandatory**	Technical Bulletin 99/05

Guidance	Link
The MOD Carbon Saving Booklet	MOD Carbon Saving Booklet
Energy Consumption and Data Standard	Practitioner Guide 02/10
Justifying and Delivering Voltage Optimisation on the MOD Estate	Practitioner Guide 01/10
Inspection, Testing & Certification of Low Voltage Electrical Installations on MOD Property	Practitioner Guide 04/09
Low Voltage Electrical Installations on MOD Property	Practitioner Guide 03/09
DIO Renewable Energy Guide	In Development
Design and Maintenance Guide 17 – Determining Design Energy Targets - Predicting Energy Demand at Design Stage - Sub-metering - Monitoring Feedback from Designers and Occupiers	Technical Bulletin 99/15
Energy Management for the Defence Estate – Good Practice Self Audit Checklist	Technical Bulletin 99/03
Energy Efficiency Advice Term Consultants	Technical Bulletin 97/49
Renewable Energy-Feed in Tariffs (FITs)	DIO IN 08/09
New gas installer registration scheme: CORGI replaced by Capita	DIO IN 15/08

External Organisations	Contact Details
Carbon Trust	**Website:** www.carbontrust.co.uk
Energy Savings Trust	**Website:**www.est.org.uk

Useful Contact	Number
DIO Strategy & Policy Directorate Energy Advisor	0121 311 3822

Find Out More…

Sustainable Development Minimum Standard: 2

WATER

Desired Outcome: The building is water efficient and incorporates water saving measures, and pollution and flood risks are managed during construction and operation. Water use is minimised during construction.

MOD Objectives

- Ensure all our sites become more water efficient, to comply with Government and MOD targets
- Maximise natural drainage and contribute to flood risk management

Government Targets

- Reduce water consumption in line with the Greening Government commitments
- Achieve a water consumption level of 4m^3 per FTE on office estate by 2016/17

You must…

- Liaise with the appropriate Aquatrine Service Provider (ASP) to discuss supply and consumption requirement rates.
- Install water meters for all new domestic buildings as defined in Building Regulations and Code for Sustainable Homes.

Best Practice

- Install water meters for all new buildings and refurbishments (where meters not already in place) and sub-meters for major areas of water use.
- Investigate the potential for a Sustainable Urban Drainage System on all new developments to address uncollectible rainwater run-off.
- Investigate the potential for a green roof to reduce the amount and slow the rate of rainwater run-off.
- Install push taps/spray taps and flow restrictors as standard on all buildings.
- Include water efficiency and water saving devices as part of all internal and external design work.
- Avoid planting vegetation which requires high water demand (e.g. willow).
- Investigate the need for balancing ponds, dependent on local water levels and geology.

Water Saving Devices

The following table outlines the current standards for water consumption and the proposed best practice level:

Water Fitting	Water Supply (Water Fittings) Regulations	Proposed Government Buying Standards (best practice level)
Single flush W/C	Maximum 6 l/flush	Flush volume of 4.5 litres
Dual / reduced flush WC	Less flush must not exceed two-thirds of the larger flush volume	Effective flush volume of 4.5 litres or less (includes a 6/4 litre dual flush with a
Retrofit flush device		All devices must demonstrate a reduction in flush volume of at least 20% at the reduced flush setting when installed on a 9 litre WC cistern.
Single stall urinal	Manual or auto operated pressure flush must not deliver more than 1.5 litres per bowl each time the device is operated. Automatic flush system must not deliver more than 10 litres per hour for a cistern servicing a single urinal.	Waterless
Multi stall urinal	Automatic flush system must not deliver more than 7.5 litres per hour urinal bowl or stall	Waterless
Basin taps	Minimum flow rates, no criteria for maximum flow rate	<4 l/min (AECB best practice)
Kitchen taps	Minimum flow rates, no criteria for maximum flow rate	4-6 l/min (AECB good practice)
Shower	More than 12 l/min requires notification to the water supply undertaker	Maximum 9 l/min. If a non-compliant showerhead requires a flow regulator to meet the target, these must be bought together as one product.
Bath	Notify water undertaker if installing bath with a capacity of 230 litres or more	
Washing machine	27 litres per kilogram of wash load (48 litres per washer drier). This is considerably higher than is achievable with modern machines.	Less than 10 l/kg
Dishwasher	4.5 litres per place setting (domestic)	Less than (0.625s + 9.25) l/cycle, where 's' is the number of place settings
Plumbing: pipe lengths	Water consumption element not considered	
Plumbing: pressure reduction	Water consumption element not considered	
Plumbing: rainwater harvesting	Not specified. However, designs incorporating non-potable supplies must demonstrate that these are in line with relevant standards (e.g. BSI standard for rainwater harvesting).	

(*Source:* WRAP Model procurement requirements for water efficiency, 2011)

Hints and Tips

Sustainable Urban Drainage Systems

Sustainable Drainage Systems (SUDS) ultimately seek to reduce the amount and slow the rate of surface runoff and divert it for other purposes. This in turn reduces the pressure on traditional drainage and sewer systems.

Techniques that come under SUDS usually involve some of the following components:

- Permeable and porous surfaces to reduce surface runoff
- Ponds/basins for temporary storage during high magnitude rainfall events (detention basins) or longer term storage (retention basins)
- Pipework and channeling to divert water from undesirable locations
- Structures that increase the lag between a rainfall event and discharge of water to the drainage system by increasing infiltration.

Important Note: Careful consideration is needed before opting for a Sustainable Urban Drainage Systems (SUDS). Ideally it should only be used if there is a problem (or a potential problem) in the receiving sewers or with flooding. Some examples where it may not be needed are:

- Naval bases with direct discharges of surface water to the sea
- Airfields discharging to burns or rivers with no history of flooding, or rivers closely adjacent to the sea

Consult with the Local Planning Authority or the Environment Agency / Scottish Environment Protection Agency to help judge site specific risks and suitable technologies.

Aquatrine Service Providers (ASP)

As stated in the Integrated Projects Guide (section 2.3.4.2) the DIO PM (or equivalent) will need to discuss water and drainage requirements with the ASP. For detailed guidance please read the Aquatrine Manual

Case Studies

Case Study 2

Waterless Urinals

Installation of 30 waterless urinals as part of the construction of the Gaza Megiddo Core Works Project. Predicted to save between 1.2 Megalitres of water per annum when commissioned (Design Consultancy estimations).

Passive Infra-Red Urinal Controls

A trickle feed urinal with a 6 litre cistern, flushing 4 times per hour, every hour of every day cost £682 a year to operate at current South West Water charges for water & sewage.

Installing a PIR in a restaurant where the urinals were only in use during the evenings, and for weekend lunch time reduced the annual cost to £130.00.

Cost of PIR controls = £130 (plus installation)

Savings = £552.00 per year

4 buildings at Sandhurst 237 devices were fitted reducing demand by 36.000m^3

Chesswood Middle School

Chesswood Middle School saved nearly 900m^3 per year (a 68% reduction in the total amount of water used by the school) by fitting urinal flush controllers (Water efficient schools: Chesswood Middle School Project, Magda Styles and Terry Keating, Southern Water 2000).

Urinal flush controllers proved to be the most cost effective of a range of water efficiency measures installed throughout the school. Similar savings have been seen in many other studies.

Water use due to urinals	1314 m^3 per year
After fitting controllers	419m^3
Water saved	895m^3
Money saved	£1414 per year
Cost of installation	£960
Payback	Around eight months

Further Information

Policy	Link
JSP 418 Leaflet 17 – Utilities Management	JSP 418 Leaflet 17
JSP 418 Leaflet 19 – Water Pollution	JSP 418 Leaflet 19

Guidance	Link
Project Aquatrine - The MOD's Water and Wastewater Private Finance Initiative	EBMS Maintenance - Aquatrine Process 2.10
Surface Water Management Plan – Technical Guidance (DEFRA)	**Website:** www.defra.gov.uk

External Organisations	Contact Details
Defra	**Website:** www.defra.gov.uk
Environment Agency	**Website:** www.environment-agency.gov.uk
WRAP	**Website:** www.wrap.org.uk
Chartered Institute of Water and Environmental Management	**Website**: www.ciwem.org

Useful Contacts	Link
DIO Strategy & Policy Directorate Water Contact	0121 311 2126
Aquatrine	
Package A – Kelda Water Services	**Website:** www.keldawater.co.uk
Package B – Veolia Water Nevis Ltd	**Tel:** 01383 749630
Package C – C2C Services Ltd	**Tel:** 0121 722 6028

Find Out More…..

Sustainable Development Minimum Standard: 3

Construction Waste

Desired Outcome: Waste minimisation is considered early in design, managed on site during construction, diverted from landfill and recovered for reuse or recycling. Provisions are made for effective waste management in operation.

MOD Objectives

- Halve construction waste going to landfill by 2012 (against a 07/08 baseline), i.e. ensure that at least 80% is diverted from landfill.
- Minimise the use of resources in defence construction.

Government Targets

- Set procurement requirements on each project over £300k to include targets for waste reduction, reuse and recovery in the Site Waste Management Plan from an early design stage, and report annually on the percentage of waste from these projects diverted from landfill.
- Recover[2] 80% construction waste, 80% demolition/strip out, 90% demolition waste. Progress to zero construction waste to landfill by 2020.
- All new build materials to be 15% recycled content, and 10% for refurbishments. (*only applicable to projects over £300k in value)*

You must…

- Produce a Site Waste Management Plan and record waste data for all new builds and refurbishments (over £300k) and report[3] on a quarterly basis.
- Effectively manage all hazardous materials (e.g. asbestos) and dispose of it via a licensed contractor.
- Ensure that 80% of unused construction materials, 80% demolition/strip out waste, and 90% demolition waste is recovered for re-use/recycling.

Best Practice

- Explore joint waste management opportunities with other MOD projects or local community.
- Implement the principles of the waste hierarchy (see Practical Guidance).
- Ensure provision of space for the storage and sorting of recyclables inside and outside the building and onsite during construction.
- Ensure the occupant/user is aware how to maintain and operate the building and how to dispose of items that may require replacing during the life of the building (e.g. electrical items etc).

[2] Recover means either through reusing, recycling, composting etc, rather than ending up in landfill.
[3] Normally to the RPC Supplier SD Focal Point who will then report to DIO Strategy & Policy SD Team

Practical Guidance

Site Waste Management Plans

The Site Waste Management Plans (SWMPs) Regulations 2008, came into effect on 6 Apr 08. The Regulations apply in England only; however, it is MOD policy that SWMPs should be produced for all MOD construction projects valued over £300k.

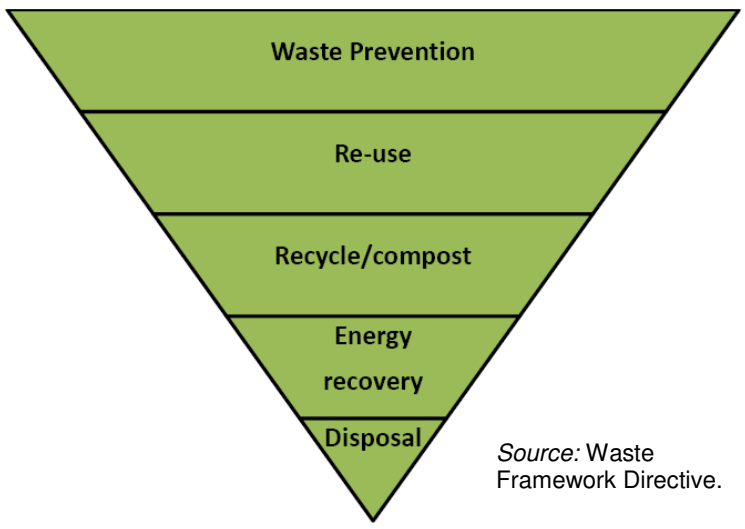
The Waste and Resources Action Programme (WRAP) have produced a SWMP template and guidance which can be used for MOD estate projects. Please visit the WRAP website. You just need to enter your name and email address to download the template.

The WRAP SWMP template will allow you to:

- produce a SWMP that meets regulatory requirements;
- set actions to prevent, reduce and recover waste;
- identify waste reductions at the design stage;
- forecast the waste arisings;
- record waste carriers and waste management facilities;
- prepare waste management actions;
- record actual waste movements; and
- benchmark against Standard, Good and Best Practice.

Waste Hierarchy

The diagram below shows the principles of the waste hierarchy. This should be applied to all MOD estates Core Works activities:



Source: Waste Framework Directive.

- The most effective environmental solution is often to reduce the generation of waste – **prevention**
- products and materials can sometimes be used again, for the same or different purpose – **re-use**
- resources can often be recovered from waste – **recycle or compost**
- value can also be recovered by generating energy from waste – **energy recovery**
- only if none of the above offer an appropriate solution should waste be **responsibly disposed of** at a licensed facility.

Hints and Tips

Hazardous Waste / Licenses

Projects must:

- Address waste considered to be hazardous under the hazardous waste regulations, for example: **lead acid batteries or fluorescent tubes**
- Address waste that is not considered to be hazardous, for example: **edible oil**
- Address waste that needs to be assessed to find out whether it is hazardous or not, for example: **ink or paint**

All sites in England and Wales that produce over 500 kg of hazardous waste must register with the Environment Agency as hazardous waste producers before waste is removed from the premises or treated/disposed of. Those sites producing less than 500 kg of hazardous waste no longer need to inform the EA that they are exempt.

Construction Waste – Best Practice Guidance

The following should be considered:

Hints and Tips

Economic factors

- Lean construction seeking efficiency and waste reduction in all management activities. Better quantity surveying to reduce over-ordering.
- Seek to minimise Quality Related Events and reduce defects and waste
- Supply chain engagement to address: materials choices, minimising packaging waste, take-back schemes for packaging and materials, use or return to stock, uses of recycled materials

Operational Construction Issues

- Make waste minimisation and management a key part of day-to-day management activity and reporting
- Recycling paper and segregating plastic bottles and tin cans etc.
- Minimise transportation of waste
- Efficiency in mass production of hot food
- Efficient waste management in kitchens and food areas

Construction Planning and Logistics

- Offsite prefabrication and use of standard size components to minimise waste.
- Store materials to prevent deterioration and unused materials for snagging, 12 month defects inspection and ongoing FM maintenance of building.
- Return of palleting and packaging to manufacturer or third party specialist.
- Segregation of waste to allow return to manufacturer under take-back schemes

Methods of Construction

- On-site temporary factory production, benefits: less vehicles to deliver materials, aiming for factory conditions and better quality work and less waste.
- Use of standard size components without cutting, to minimise off cuts and waste.
- Assembling things as multiples of units, minimising waste, using left over pieces until all gone.

See also Sustainable Procurement (e.g. Materials and Products) standard.

Construction Waste Management Framework Guidance

Stage	Step	Overview Guidance
Pre-Design	1. Set Requirements	• Set waste minimisation as a Key User Requirement • Specify specific requirements e.g. seek high proportion of recycled content
Procurement Process	2. Identify Opportunities	• Require a pre-demolition audit to identify quantities and materials that can be used • Type of project – look for best practice • Materials: quantities, types, packaging • Approach: Materials ordering and management, • Scope for innovation
	3. Plan Waste Management	• Develop Site Waste Management Plans (or wider Waste Management Plan if multi-site) – allow sufficient time and do this robustly • Engage with waste contractors in advance • Ensure training/skills are adequate at management level • Use appropriate tools
	4. Tender and contractual	• Ensure these are appropriate to best practice implementation • Ensure waste management is addressed in tendering exercise • Require waste management sub-contractors that have appropriate experience

Pre-Construction	5. Set targets	• Set precise targets and performance indicators:
		  ○ Minimum % that must be recovered
		  ○ Minimum % recycled content

	6. Define responsibilities	• Define the required roles and make clear who is responsible for what • Work closely with waste contractors
	7. Identify waste routes	• Identify the waste arising, reuse and recycling routes • Monitor to ensure waste goes where planned
	8. Site design and training	• Design site to facilitate good materials and waste handling e.g. good vehicle access and space for waste segregation • Ensure that onsite staff have appropriate training for best practice waste management

Construction	9. Monitor Waste Management	• Collect accurate data • Check that processes are operating • Monitor onsite materials and waste handling
Post-Construction	10. Review performance	• Analyse waste data • Examine lessons learned • Compile performance review report on waste • Include as part of case study as appropriate

Case Studies

Case Study 3

RAF Waddington – Taxiway Resurfacing

Aim: Relaying of the airfields taxiways

Cost of project: £14 million

Key aspects

- 1000 tonnes of waste generated a day from site
- The old non-hazardous material was reused in the lower levels of the new taxiways which avoided sending waste to landfill
- **Saved £600,000** by avoiding landfill
- Other benefits of avoiding landfill included the avoidance of extra traffic on local roads and the associated carbon emissions in transporting the material 70-80 miles to the landfill site
- Metal from the site was sold as scrap and recycled and the money generated was given to a local school

Further Information

Policy	Link
Site waste Management Plans (SWMPs) Regulations	DE PI 03/08
Construction Waste Policy Instruction	In Development

Strategy / Guidance	Link
MOD Waste Strategy	In Development
DIO Waste Strategy	DIO SD Information Portal - Waste
WRAP - Reducing waste and the costs of waste in construction works	WRAP DIO PM Checklist (TBC)
	WRAP DIO Commercial Checklist (TBC)

External Organisations	Contact Details
Environment Agency	**Website:** www.environment-agency.gov.uk
Waste Resources Action Programme (WRAP)	**Website:** http://www.wrap.org.uk

Useful Contacts	Number
DIO Strategy & Policy Directorate Waste Policy Advice	01225 885907

Find Out More……

Sustainable Development Minimum Standard: 4

Biodiversity

Desired Outcome: Designated sites and natural habitats and species are protected with efforts made to enhance local biodiversity

MOD Objectives

- Conserve and enhance biodiversity, as part of estate stewardship, and to contribute to Government biodiversity objectives
- Comply with International, European and National legislation

Government Targets

- Action is to be taken to promote, conserve and enhance biodiversity including the use of Biodiversity Action Plans
- Where applicable Sites of Special Scientific Interest (SSSIs) are maintained in target condition with continued progress towards achieving favourable condition

You must…

- Comply with statutory conservation obligations (*see Practical Guidance section)*
- Ensure appropriately licensed professionals undertake any required survey/assessment work
- Ensure that the development area is clearly fenced / delineated from the area of habitats or species to be protected
- Avoid disturbance of biodiversity by undertaking species and habitats (Phase 1) survey and develop a management plan early in project life, including opportunities to enhance site biodiversity
- For specific issues identified in Phase 1 undertake further assessment and planning as required by legislation

Best Practice

- Plant local, appropriate native species of vegetation. Give careful consideration to vegetation in the vicinity of airfields etc.
- Utilise environmental mitigation hierarchy to address biodiversity issues identified (avoid, mitigate, compensate) or biodiversity opportunities
- Deliver the biodiversity requirements identified by the Sustainability Appraisal and project management plan

Practical Guidance

Please refer to the Practitioner Guidance documents on Designated Sites, Protected Species and Biodiversity for information on our Statutory Conservation Obligations and practical examples. These will be available on the MOD Internet shortly. Please see '*Further Information'* section for contact details.	**Hints and Tips**

Case Studies

Bovington Terrier Project The project had two key requirements: 1) a new building to house simulators for training and; 2) new digging site to facilitate a required driver test. The military need for the digging site was for a five hectare site close to the other training facilities to avoid unnecessary movement of troops, equipment and vehicles. **Outcomes and Benefits** From an ecological perspective, a key requirement of the project was to ensure no overall adverse impact on the nearby designated sites or any protected species. Key biodiversity appraisals were conducted including: • A reptile survey that recorded both sand lizard and smooth snake on the fringes of the plantation to the north of the digging site. • A invertebrate survey was the most revealing of all with 214 species recorded from the digging site, of which one was a Red Data Book species and 13 were classed as Nationally Notable. A further 42 were classed as local, meaning they are of regional or county importance. To investigate the potential scale of run-off issues from the digging site to surrounding areas a hydrological survey was also commissioned in 2007. This resulted in a detailed mitigation plan being developed which included the following: • Improvements to 0.6ha of heathland adjacent to the digging site by felling conifers, exposing a deep ditch and retaining a pond. With careful felling and removal of all arisings it is anticipated that the heathland will regenerate quickly, providing additional habitat for sand lizards, smooth snakes and silver-studded blue butterflies in particular.  • Artificial earth bunds at least 1m high, totalling over 450m in length, were created around three sides of the digging site using surplus sand and topsoil. The outer layer of the bunds was unconsolidated sand to allow reptiles and invertebrates burrowing opportunities. The bunds provide bare ground habitat and recolonisation by heather will stabilize them to create additional heathland habitat.	**Case Study 4**

- Creation of an additional 1.6ha of heathland by retaining a buffer strip around the edge of the digging site using cut tree stumps to exclude vehicles. The seedbank should retain enough viable seed to allow natural regeneration of the vegetation.

- To manage storm water runoff and mitigate against flooding, a series of Sustainable Urban Drainage measures were adopted, including the installation of perimeter surface water ditches, flow balancing/settlement ponds, pollution interceptors and a groundwater recharge trench.

- To address specific concerns about downstream siltation onto the SSSI, a small number of silt dams made from conifer brash were erected downstream from discharge points.

The Terrier project was delivered successfully, the result of collaborative working between the project team that included Defence Estates specialists, Debut Services SW Ltd and Natural England. The ecological interest surrounding the project was properly investigated and assessed; ensuring appropriate mitigation and enhancement measures were identified and implemented.

Further Information

Find Out More……

Policy	Link
MOD JSP 362, Defence Lands Handbook	Section 3, Leaflet 7
MOD JSP 418 – SD Manual	Leaflet 3

Guidance	Link
Protected Species Practitioner Guide	Available on the MOD Internet soon.
Designated Sites Practitioner Guide	Available on the MOD Internet soon.
Biodiversity Practitioner Guide	Available on the MOD Internet soon.

External Organisations / Departments	Contact Details
DEFRA	08459 33 55 77
Natural England	0845 600 3078
Countryside Council for Wales	0845 1306229
Scottish Natural Heritage	01463 725000
Northern Ireland Environment Agency	0845 302 0008

Useful Contacts	Number
Pippa Morrison, Policy Officer – Biodiversity & Appraisal Tools, DIO Strategy & Policy Directorate Sustainable Development Team	9355 85133 or 01225 885133
Dr Stuart Otway, Natural Environment Team, Defence Estates Professional Technical Services -Environmental Advisory Service	94325 4820 or 01980 674820

Sustainable Development Minimum Standard: 5

Heritage

Desired Outcomes: Heritage assets are safeguarded and the design and construction of any new buildings, extensions or refurbishments is sympathetic to and where possible enhances the heritage value of the site

MOD Objectives

- Be an exemplar in heritage management on the estate.
- Manage and sustainably develop heritage assets reflecting the ethos and heritage of MOD and to promote a sense of place for defence communities.
- Comply with legislation and policy regarding designated heritage assets.

Government Targets

- To continue to set a good example in the care of its historic estate in meeting the appropriate standards of care and use of its historic assets. This will be achieved through delivering the principles and requirements contained within the:
  - English Heritage *Protocol for the Care of the Government Historic Estate* 2009
  - Historic Scotland *Scottish Historic Environment Policy* 2009

These commitments apply across the devolved administrations and overseas

You must…

- Ensure a Heritage Adviser within DIO Ops is consulted at the earliest opportunity.
- Have the required heritage consents or clearances for any work being undertaken including any external authorisation.
- Identify heritage assets (designated or otherwise) and their significance on the site together with any “setting” or “curtilage” issues including buried archaeology.
- Ensure all heritage assets are protected during the construction phase of the project and ensure heritage assessments are carried out on the site if required.
- Record to the required standards any assets that are demolished or substantially altered as a result.
- Ensure that contractors have the relevant qualification and experience in dealing with the type of heritage encountered
- Ensure the design, including materials used for all new builds and refurbishments are sympathetic to and, where possible enhances the heritage value of the site including any landscape or townscape issues.

Best Practice

- Early engagement with EH, LPA and the relevant Services heritage branch/heritage POC within the CEstO is advised.
- Check whether any development (including demolition) is of heritage value to the Armed Forces.
- Ensure heritage assets included within any management plan (IRMP, EMS, IEMP) are revised as a result of the project.

Practical Guidance

Identifying What is Significant

Establishing a baseline of information on historic assets is crucial to allow project planners to make informed decisions about their projects. It will also be a consideration within the planning process. This should include non-designated heritage assets as well as designated assets and the potential for archaeological deposits which have yet to be located.

It is important to determine existing level of knowledge e.g. heritage component of IRMPs, RPC asset smart plans etc. DIO's Historic Environment Team (HET) should be contacted in the first instance with a Request For Information. HET can advise whether any existing reports are available e.g. Conservation Management Plans, Quadrennial Inspections, other desk-based assessments, Rough Order of Estate Information etc.

Non-designated assets may be of heritage value to one of the Services. Projects should consult with the relevant TLB CEstO or historic branches to determine any service heritage value.

Using External Consultants

It is MOD policy to use appropriate expertise to provide advice on heritage implications of projects including design materials etc. Project Managers should contact the HET in the first instance. The HET should assist with initial stages of the project e.g. reviewing Statements of Requirements even if they are unable to assist with the project delivery.

Where HET is unable to assist further, the project manager can procure external consultancy, through existing framework agreements, the RPC etc. It is essential that any external consultancy has the expertise relevant to the heritage issues of the project.

Design

As design quality is essential to delivering a sustainable project. The design (and use of materials) should complement and where possible enhance the heritage value of the site. English Heritage has established a series of Conservation Principles which are available from HET. Historic buildings factsheets are available, with guidance on a range of issues e.g. ironmongery, window glass, traditional walling materials etc.

New Build v Refurbishment

Careful consideration should be given whether to demolish and build new rather than refurbish existing buildings. Often refurbishment is the most sustainable option – e.g. retention of embedded energy. Refurbishment may also retain the heritage and landscape value of the establishment which supports sustainable communities and enhances sense of identity. It is important to reflect any Service heritage issues.

If a building is designated or within a Conservation Area there will be a presumption against demolition. Necessary consents and permissions will be required if this option is to be perused. It is important to note that the interior and curtilage of a building is included within its listing status and will need to be considered.

Hints and Tips

Recording

Recording requirements should be included within the design brief for works which affect a Scheduled Monument or Listed Building. It is a matter of best practice to record structures which are subject to demolition through photography; this should include a scale and should record details of the building. As with all recording elements, advice on the methodology to be utilised and levels of detail required can be found either on discussion with HET or in 'Understanding Historic Buildings – A guide to good recording practice' (English Heritage, 2006).

Heritage Consents

Crown exemption has been removed from the planning process (including Conservation Areas, World Heritage Sites etc.) and listed building legislation. Project Managers must ensure they have gained permissions for works affecting heritage assets.. Planning permission may requirement a heritage desktop study or evaluation with a subsequent mitigation strategy being put in place. These should be discussed with the HET and Estate Surveyors. Scheduled Monument Clearance must be also obtained for any work which affects a Scheduled Monument or its setting.

Climate Change, energy and renewables

Climate change (adaptation and mitigation) is afforded a priority within project delivery. This can conflict with the heritage value of the asset. Often historic buildings are more resilient to the effects climate change than new builds. Project managers must carefully consider heritage implications and requirements within any climate change measures e.g. fitting double glazing, installing cavity wall insulation or renewables. These must be sympathetic to the heritage value of the asset and may require the appropriate consents and permissions.

Case Studies

Case Study 5

Refurbishment of Officers' Mess at RAF Northolt

The Grade 2* Listed Officers Mess at RAF Northolt has been refurbished as part of Project MoDEL, a major estate consolidation and redevelopment programme,

Constructed in the 1920's as part of the Trenchard expansion period, the Mess has important historical associations with the Battle of Britain. The front façade and principal rooms, which survive from the original 1920's scheme, are the main areas of architectural interest. The building also has several significant features including a clock tower, entrance porch and musician's gallery.

The refurbishment involved extensive discussions between Project MoDEL, VSM Estates (the MoDEL Contractor), English Heritage, the Local Authority and RAF Northolt. There was a strong desire to ensure the building be retained in its original use, and it was necessary to update and enlarge the accommodation whilst maintaining the unique character of the building.

The building needed to become fit for purpose due to of the relocation of personnel to RAF Northolt under MoDEL. The dining facilities were too small for formal dining; the reception spaces awkwardly planned and the service areas (kitchens etc.) required enhancing. The Mess accommodation also required an upgrade with en suite facilities. There were no provisions for wheelchair users to access the building.

A new entrance pavilion now provides improved access and a new single storey extension to the rear now houses additional dining and kitchen facilities. The extension is connected to the original building through the former kitchen, which has been converted into an ante-room between the new and historic buildings. The original dining hall remains for larger events and the rooms by the original entrance have been retained and restored. The bar area has been opened up and extended into previously unused corridor space.

To ensure occupants could not tell old from new, the interior designers agreed the décor with Station representatives to ensure this requirement was met. All historic features of the original rooms were kept. The external appearance of the building was enhanced by replacing plastic sash windows with new windows based on the original casement designs. All plastic gutters, wires, cables and lights were also removed from the façade of the building. Adjacent unsympathetic buildings were also removed as part of the project. These measures have allowed a setting to be created that once again reflects the importance of the Officers' Mess to RAF Northolt.

Further Information

Policy	Link
JSP 362 Defence Lands Handbook leaflet 12	Defence Intranet

Guidance	Link
Heritage Strategic Statement	Heritage Strategic Statement
Historic Environment Practitioners Guide	In Development
MOD Heritage Reports	Defence Intranet
Heritage Section on SD portal	DIO Intranet SD Portal

External Organisations / Gov.Dep.	Contact Details
Government Historic Estate Unit, English Heritage	www.helm.org.uk/gheu www.english-heritage.org.uk
Historic Scotland	www.historic-scotland.gov.uk
Cadw	www.cadw.wales.gov.uk
DOE Northern Ireland	www.ehsni.gov.uk
Local Authorities	Conservation Officers

Useful Contacts	Number
Heritage Policy Advice, DIO Strategy & Policy Directorate	01225 883789
Historic Environment Team, PTS, DIO Ops North, Westdown Camp	01980 674718
Heritage at Risk Officer, PST, DIO Ops North, Westdown Camp	01980 674665
Air Historical Branch, RAF Northolt	020 8833 8161
Army Heritage Branch, Upavon	01980 615089
Royal Navy CestO	01329 334054

Find Out More……

Sustainable Development Minimum Standard: 6

Climate Change Adaptation

Desired Outcome: Projects are adapted to the projected impacts of climatic change within the lifetime of the asset.

MOD Objectives

- Increase resilience to climate-related hazards by undertaking Climate Impact Risk Assessments (CIRAM) for all defence critical sites by March 2013 and other priority operational sites by 2015
- Use outcomes of CIRAM assessment to inform management at strategic and establishment level
- Comply with UK and European planning policy and building regulations on climate change adaptation. Ensure Defence capability is not compromised and any potential benefits from the future climate are realised.
- Location, aspect, planning and design of new assets, buildings and refurbishments are informed by potential site impacts from climate change.
- All assets are adapted to the projected impacts of climate change and resilient to extreme weather conditions

Government Targets

- Under the Climate Change Act 2008, the UK Government is required to undertake and assessment of current and future climate risks to the UK every 5 years, with the first report to Parliament required by January 2012.
- Under the Greening Government Commitments, 2011, Departments are required to adapt their estate to a changing climate.

You must…

- Understand current and future UK Climate Projections 09 (UKCP09) climate impacts throughout the life of the asset.
- Incorporate the appropriate adaptation measures into the design of new developments and refurbishments that will increase the building/infrastructure resilience to current and future climate.
- Ensure occupiers and managers are aware of how to effectively use and maintain the building.
- Ensure the location, design and footprint of the development does not increase, and where possible reduces flood risk, taking into account increased frequency and intensity of rainfall. The development should also take the risk of subsidence into account.
- Ensure the overall envelope of buildings is resilient to ingress from increased rainfall and wind speed and fully integrates passive design measures that provide comfortable temperatures for the projected climate throughout the life of the asset. Air conditioning should be avoided.
- Consider mitigation measures that also minimise climate risks or exploit potential opportunities like rainwater harvesting, SUDS and renewable energy options.

- Design assets flexibly to allow for future modifications under future climatic conditions.
- Ensure construction methods allow for the project to be delivered under projected climatic conditions (consider drainage, traffic disruptions, supply chain).
- Understand the risks and resilience of services and infrastructure to the development (e.g. security of water and energy supply).

Best Practice

Practical Guidance

Hints and Tips

Assessing the climatic risks to the project

To identify how climate change could affect your development it is important to understand how weather conditions currently affect the site. It is then necessary to consider the latest climate change projections (UKCP09) and understand whether climate change will exacerbate existing issues or create new ones. You need to:

- Understand existing climate risks (e.g. high winds, increased temperature, severe weather events) and vulnerabilities (e.g. poor drainage) at the site.
- Understand how the UKCP09 climate projections may affect the operational life of the asset

The outcomes of this climate assessment should inform the location, aspect, layout, design and materials of the new development/refurbishment so that the performance of the asset will be maintained thorough out its life. The establishment may have undertaken a CIRAM assessment which can further inform the project delivery.

For large scale projects, programmes it may advisable to undertake a full CIRAM assessment.

Climate Impacts Risk Assessment Method (CIRAM)

CIRAM is a tool that identifies current and projected impacts of climate change on MOD establishments and identifies adaptation measures and actions to maintain and optimise future operational capability of the establishment. The outcomes of CIRAM can inform the location, design and maintenance of new assets ensuring their resilience to climate throughout their asset life. CIRAM will help to:

- Review recurrent existing issues / nuisances due to weather at the location
- Review extreme weather events that caused damages at the location and impacted on normal operations/activities
- Review if UKCP09 climate projections suggest that these issues could get worse in the future
- Think about direct and indirect impacts, for example

Climate Change	Direct impact	Indirect impact
Increased likelihood of rainwater ingress in buildings exacerbated by poor building design (e.g. flat roofs).	Damage to buildings: ceiling collapses, alarm systems & desk IT failures	Offices un-operational, reduced working productivity.
	Damage to buildings: Mould	Increased maintenance costs. User's health problems.

The CIRAM tool can be found in the SEAT Handbook, Chapter 7.

Flood Risk

The Environment Agency and Scottish Environment Protection Agency flood maps provide data on river and tidal flood risk and can inform the development if the site is at risk of flooding. However, these maps and data do not take into account the climate projections or provide information on from groundwater or surface water flooding.

CIRAM can assist to determine which types of flooding are a risk to the site and also if a more detailed Flood Risk Assessment (FRA) is needed.

Consult with the Local Planning Authority the need to appraise (undertake FRA), manage and reduce flood risk in compliance with Planning Policy Statement 25: Development and Flood risk (England), Planning Policy Stament15: Planning and Flood risk (Northern Ireland), Technical Advice Note 15: Development and Flood risk (Wales) or Scottish Planning Policy 7: Planning and Flooding.

Case Studies

RMB Chivenor – MT facilities and flood defences adapted to climate change

Case Study 6

The new motor transport facilities at RMB Chivenor have been designed to minimise wind and overheating risks. As part of the development, which also includes new accommodation blocks, a Flood Risk Assessment (FRA) of the site was undertaken and new flood defences designed in compliance with PPS25. The new defences, currently being constructed, have been designed to protect RMB Chivenor facilities for at least the next 25 years and can be adapted thereafter.

Adaptation options are common sense sustainable choices providing multiple benefits – HQ ARRC Innsworth

The design of the new nursery at HQ ARRC Innsworth has incorporated adaptation measures including:

- Solar shading, providing up to 85% reduction in solar heat gain plus energy savings
- Natural ventilation, providing increased occupant comfort and energy savings
- South facing orientation, manages solar gain and wind providing energy savings
- Sedum green roof provides thermal insulation and benefits in terms of storm-water runoff, improved air quality, nature conservation and up to 40% noise reduction.

Further Information

Policy	Link
JSP 434 Part 1 Defence Construction in the Built Environment	JSP 434 Part 1 Defence Construction in the Built Environment
JSP 435 Estate Management	JSP 435
Planning Policy Statement 25 Development and Flood risk	Planning Policy Statement 25 Development and Flood risk
Climate Change Act 2008	Climate Change Act 2008
Floods and Water Management Act 2010	Floods and Water Management Act 2010
Defra - Climate Change: Taking Action	Climate Change: Taking Action

Strategy / Guidance	Link
MOD Climate Change Strategy	MOD Climate Change Strategy
Practitioner Guide – Building a Climate Resilient Estate	DIO Practitioner Guides
Adapting to climate change: a case study companion to the checklist for development	London Climate Change Partnership
Defence in a Changing Climate	Defence in a Changing Climate
Climate Change Adaptation by Design	Town & County Planning Association

Organisations/Departments	Contact Details
Government's Adapting to Climate Change Programme	www.defra.gov.uk
UK Climate Impacts Programme	www.ukcip.org.uk
UK Adaptation Sub-committee	www.theccc.org.uk/asc-home

Useful Contacts	Number
DIO Strategy & Policy Directorate Climate Change Adaptation Policy Advice	01225 883523

Find Out More……

Sustainable Development Minimum Standard: 7

Sustainable Communities

Desired Outcome: Defence sites and buildings are places that meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life.

- Look for opportunities to work with the Department of Communities and Local Government, Statutory Bodies and local communities to promote social cohesion.
- Ensure the development of Sustainable Communities and the management of social impacts is a key feature of estate planning and management.
- Work with UK Health Departments to improve clinical support to the Armed Forces, their families, veterans and the public.

MOD Objectives

- All Departments, Agencies and Executive NDPBs to conduct sustainability appraisals of office relocations.
- All Departments to encourage staff to take an active role in volunteering in the community.

Government Targets

- Ensure that appropriate engagement has taken place with all relevant stakeholders including community groups and interested parties.
- Encourage staff to take an active role in volunteering in the community, where appropriate.

You must…

- Ensure that all major establishments have appropriate formal liaison arrangements with local communities.
- Meet our declared presumption in favour of safe public enjoyment of the estate wherever this is compatible with military training and operational requirements, safety, security, conservation and the interests of our tenants.

Best Practice

Practical Guidance

Please see the separate Practitioner Guide on Sustainable Communities (currently in development).

Hints and Tips

Case Studies

Marchwood Playpark

A play area was delivered by DIO and MODern Housing Solutions (MHS) for the children of Service personnel based at the 17 Port and Maritime Regiment, Royal Logistics Command at Marchwood near Southampton.

The play park features specially designed play equipment that reflects the work of the Regiment. For example, children can scramble aboard a junior version of a military style landing craft.

The play area provides an important recreation area for the children who live in nearby Service Families Accommodation (SFA) as well as local civilian families.

The children were involved in naming the new play park 'The Twistle Park'.

Case Study 7

Further Information

Policy / Strategy / Guidance	Link
DE Estate Strategy 2006	'In Trust On Trust' 2006
Sustainable Communities Act 2007	Sustainable Communities Act 2007
UK Gov. SD Strategy 2005	Securing the Future
MOD Guidance	www.access.mod.uk

Organisations/Departments	Contact Details
Communities & Local Government	www.communities.gov.uk/communities/

Useful Contacts	Number
DIO Strategy & Policy Directorate Policy Advisor	01985 848734

Find Out More……

Sustainable Development Minimum Standard: 8

Sustainable Procurement (e.g. Materials & Products)

Desired Outcome: The most sustainable products and building materials are selected and derived from sustainable sources.

MOD Objectives

- All products are purchased in line with Government Policy and are compliant with European and UK procurement law.
- Minimise the use of natural resources e.g. through high recycled content.
- Influence the market to move towards innovation and sustainable materials and products.

Government Targets

- Central Government Departments and executive agencies to reach an average of Level 3 (mode) of the Flexible Framework[4] that includes at least a Level 3 for measurement and results by end of 2012 and at Level 5 for all areas by end of March 2015
- Ensure compliance with Government Buying Standards is embedded in contracts.

You must…

- Purchase products in line with the Government Buying Standards (formerly '*Buy Sustainable – Quick Wins*') policy.
- Only purchase timber and all timber containing products that are from a sustainable source. In line with DEFCON 691.
- Ensure compliance with legislation and policy with suitable assurance.

Best Practice

- Apply the Best Practice Specifications of the Government Buying Standards (rather than just the minimum mandatory elements).
- Seek to utilise innovation and keep abreast of new materials and products.
- Undertake supply chain engagement to address: materials choices, minimising packaging waste, take-back schemes for packaging and materials, use or return to stock, uses of recycled materials.
- Ensure, through the suppliers, that the manufacturing and production of materials does not impact negatively on the health, safety and welfare of workers.
- Seek to minimise requirements for all products/materials as far as possible.
- Materials are chosen based on environmental criteria and are from sustainable sources.

[4] The Flexible Framework is a self-assessment matrix to ensure Government Departments embed sustainable development within their procurement processes. There are a number of actions which are affected by Core Works projects.

Practical Guidance

The table below outlines the Government Buying Standards (GBS - formerly Buy Sustainable – Quick Wins) product groups. The GBS are mandatory minimum product specifications which central Government Departments must apply '. The GBS webpage can be viewed on the Defra's website .

Government Buying Standards Product Groups	Notes
Cleaning products	
Construction	Covering 23 products including air conditioning, boilers, glazing, and paints
Electrical goods	Including a range of electronic devices such as TVs and ovens
Food	
Furniture	
Horticulture services	Including soil products and hydraulic fluids
Office ICT equipment	Including computers, printers, scanners etc
Paper and paper products	
Textiles	
Transport	

The roles and responsibilities of staff regarding the GBS are outlined below:

ROLE	Responsibility
Commercial /Contract Officer	• Ensure the Government Buying Standards (GBS) are embedded in all appropriate contracts. • Ensure Performance Indicators are produced to regularly monitor the compliance of GBS. • Ensure a process of audit/assurance is mandated to allow for compliance reviews by the customer.
Project Manager	• Ensure that your project uses products/services compliant with GBS. • Discuss the GBS at early supplier engagement meetings. • Review GBS compliance during standard project review meetings.
Industry Partner	• Only procure products that are GBS compliant. • Inform the Contract Manager/PM/EM if GBS can't be achieved. • Inform supply chain of GBS to ensure ability to deliver.
Estate Manager	• Ensure all products/services for site maintenance are compliant with GBS (inc. life-cycle replacements). • Ensure Core Service Projects comply with GBS.
Government Procurement Card (GPC) Holders / Low Value Purchasers (LVP)	• Ensure staff are aware of GBS. • Ensure products purchased via GPC or LVP are compliant with GBS. • Raise any non-compliance issues with relevant commercial/policy staff.

Hints and Tips

Case Studies

RAF Marham- Resurfacing

Case Study 8

An innovative project is underway to resurface the southern taxiway at RAF Marham, using recycled materials from the current airfield.

The project involves the removal of the airfield's old surface, before it is processed on site. The stone is then treated in order to rejuvenate it before being re-laid back onto the taxiway. 85% of materials from the surface will be recycled and re-used in the new pavement, and the surplus will be used for other tasks on site. The project is aiming to have no waste transported from the site for disposal.

These measures are set to reduce the overall costs of resurfacing the runway, and will also lower the associated CO_2 emissions.

As part of the project the energy efficiency of the airfield itself will be improved, with the installation of new LED lights which require only 5% of the power used by the existing lights.

Further Information

Find Out More……

Policy	Link
Government Buying Standards policy instruction	DIO PI 04/11
	Government Buying Standards Product Specification List
Sustainable Procurement Policy Instruction	DE PI 11/08

Guidance	Link
Procuring Sustainably: A DIO Practitioner Guide	SP Practitioner Guide

Organisations/Departments	Contact Details
Centre of Procurement Excellence for Timber	Helpline 01865 243766 Email: Cpet@proforest.net **Website:** www.proforest.net/cpet
Office of Government Commerce (OGC)	**Phone:** 0845 000 4999 **International:** (+44) 845 000 4999 **GTN:** 3040 4999 **Email:** ServiceDesk@ogc.gsi.gov.uk
Green Specification	www.greenspec.co.uk

Useful Contacts	Contact Information
DIO Strategy & Policy SD Team	01225 885907
DIO Strategy & Policy SD Team	01225 884142

Greening Government Commitments: Operations and Procurement (Formerly SOGE Targets)

Annex A

The Greening Government targets were launched on February 28th 2011, to replace the SOGE targets that expired at the end of 2010/11.

Some targets are under development at time of publication, but the most up to date version is on the Defra webpage

Underpinning aims:

Leading by Example – to show leadership to the wider public sector, businesses and citizens, setting ambitious goals, sharing good practice and innovation and communicating results.

Efficiency and Reform – reducing demand for resources and tackling waste, to obtain value for money. Reforming our relationship and working in partnership with key suppliers.

Transparency and Accountability – publishing more of our performance data, in relation to both our own activities and impacts and those of our supply chain.

Long term Vision - to significantly reduce the impact we have on our environment, reducing greenhouse gas emissions, waste and water and making our procurement more sustainable via the following commitments, to be achieved by 2015:

Topic	Target / commitment (applicable to construction)
Reducing greenhouse gas emissions	Reduce greenhouse gas emissions from a 2009/10 baseline from the whole estate and business-related transport. • Main carbon reduction target to be announced.
Waste	Reduce the amount of waste we generate by 25% from a 2009/10 baseline. • More detailed waste recovery targets to be announced.
Water	Reduce water consumption from a 2009/10 baseline • Departments to set own reduction targets • Report on % of offices meeting best practice benchmarks whereby: o >6m3 consumption per FTE = poor practice o 4 to 6 m3 per FTE = good practice o <4m3 per FTE = best practice
Sustainable Procurement	• Embed the Government Buying Standards in all departmental and centralised procurement contracts • Improve and publish data on our supply chain impacts, initially focussing on carbon, but also water and waste –

	setting detailed baselines for reducing these impacts
Climate Change Adaptation	Report against steps taken to adapt the estate to a changing climate
Biodiversity and Natural Environment	Report on action taken to promote, conserve and enhance biodiversity, including use of biodiversity action plans or equivalent, and the management of SSSIs.
Sustainable Construction	Report on the management of construction waste to best practice standards, and the application of BRE's Environmental Assessment Methodology (or equivalent)
People	Report on social and environmental assessment of office relocations, and action taken to promote staff wellbeing