

**Capital Delivery – Construction,
Electricity and Gas Transmission
Safety, Health, Environmental & Sustainability**

Good Practice Handbook and Guidance

November 2017 – Version 16



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ACKNOWLEDGEMENTS

We wish to thank all of the organisations who have participated with National Grid Capital Delivery Construction during the design and management of our construction projects.

We thank all of National Grid's Contractors for their participation in raising Safety, Health and Environmental awareness through the production and dissemination of good practice ideas which assists in improving standards on our sites. Similarly, we thank our Contractors for producing Health, Safety and Environmental Alerts, following incidents or experiences from which we can all learn.

We wish to point out that the reference in this document to 'the industry' or 'our industry' relates to the construction industry as a whole and not just National Grid sites.

INTRODUCTION

All those working on Capital Delivery Electricity and Gas Transmission Construction projects have a responsibility to ensure that all projects are delivered safely and with minimum harm to the environment.

We have made considerable progress in both safety and environment over the last few years, much of which has been instigated by the teams out in the field whose experience and knowledge has resulted in initiatives to improve our safety and environmental performance. This booklet catalogues some of these initiatives for use in the field, to help deliver the standards we need to continue on our journey towards a workplace of zero harm to people, property and the environment. Its contents are the collective recommendations from the SHESQ Leadership Forum which we are encouraging you to adopt on your projects.

Your employer has the primary responsibility for your safety, and whilst this booklet seeks to assist on SHE matters, it does not alter that relationship. If you have any queries or concerns you must raise it with your employer as soon as possible. As such this booklet does not seek to direct you how to work and could not hope to cover all aspects of the health, safety and environmental aspects of your work that are covered by your skills, experience, training and employer's procedures, nor does it replace the formal routes by which you are provided information. It does however gather together key focus points for the gas and electricity construction industry sometimes highlighted by tragic instances where things have gone wrong.

Finally, thanks to everybody that has contributed in some way to this document and we would encourage you to continue to share your good ideas.

HEALTH, SAFETY & ENVIRONMENTAL LAW

We are all responsible for protecting ourselves, others around us and the environment from harm when undertaking the work for which we are employed. In doing, we support our employers in meeting their duties, which are categorized as follows:

MORAL:-

- It is everyone's right to expect to go to work and return to their family unharmed.
- The environment that we enjoy today needs to remain unspoiled for future generations.

LEGAL:-

Health, Safety and Environmental legislation, such as:

- The Health and Safety at Work Act 1974
- The Environmental Protection Act 1990
- The Water Resources Act 1991

FINANCIAL:-

The financial impact of any safety or environmental incident can be substantial and is not limited solely to direct costs but also includes hidden costs, such as a loss to reputation, increased insurance costs etc.

KEY ELEMENTS OF FOCUS

CONSTRUCTION SAFETY ENGINEERING FORUM (CSEF) RECOMMENDED KEY ELEMENTS OF FOCUS TO HELP ENSURE HEALTH, SAFETY & ENVIRONMENTAL COMPLIANCE:

- All personnel visiting or working at a National Grid site must have received a site induction on arrival.
- Have all personnel received the minimum health, safety and environmental training for the tasks they are undertaking?
- Have competency checks been undertaken to ensure that all personnel are trained and competent to carry out the activities to which they are assigned?
- Is there an inspection / test certificate available for all plant and equipment?
- Are all personnel aware of and complying with Personal Protective Equipment (PPE) requirements for the tasks that they are undertaking?
- Ensure you have the applicable Risk Assessment and Method Statements (RAMS) for the tasks you are undertaking.
- Ensure the RAMS covers all aspects of your tasks and that you have all of the correct equipment and PPE to undertake the tasks safely.
- Have all members of the working party been fully briefed? Do they all understand how to undertake the task safely and has this been recorded?
- Have you received tool box talks relevant to the hazards / risks identified in the RAMS?
- Are Sub-Contractors operating to the same standards expect of our Principal Contractors?

AMENDMENTS & HYPERLINKS



Good Practices – Contains only good practices – accessible via this link:

<https://nationalgrid.huddle.net/workspace/23931969/files/#/folder/41101701/list>



Expected Practices – Held in Huddle and accessible via this link:

<https://nationalgrid.huddle.net/workspace/23931969/files/#/folder/41101704/list>



Safety Alerts - Held in Huddle and accessible via this link:

<https://nationalgrid.huddle.net/workspace/23931969/files/#/folder/41101707/list>

Guidance Documents – Held in Huddle and accessible via this link:

<https://nationalgrid.huddle.net/workspace/23931969/files/#/folder/35389378/list>

Amendments Spreadsheet - Revision 9 of the Good Practice Handbook was significantly amended. The amendments are detailed in a spreadsheet accessible via this link:

<https://nationalgrid.huddle.net/workspace/23931969/files/#/folder/40125324/list>

Any further amendments will form part of the Good Practice Review Group meeting minutes.

Please be aware that use of any of the information in this document, irrespective of its status (i.e. good practice or expected practice), is entirely at the risk of the Contractor who must assure themselves that the practice is appropriate for use on their project.

PROPOSING A NEW GOOD PRACTICE

The processes have been defined for proposing a new good practice and adopting an existing good practice. These process flows are available via this link:

<https://nationalgrid.huddle.net/workspace/23931969/files/#/folder/40125324/list>

Proposing a new Good Practice

When proposing a new good practice, please complete:

- The Good Practice Matrix
- The Good Practice Proposal Supporting Documentation Template
- Good Practice PowerPoint Template

All of these documents / templates are available here:

<https://nationalgrid.huddle.net/workspace/23931969/files/#/folder/41101965/list>

1. HEALTH AND WELLBEING

GP No.
1.1

HEALTH CHECKS - “KNOW YOUR NUMBERS”

Companies are expected to have a health and wellbeing programme which could include a mobile health facility offering free health checks such as:

- BMI
- Blood pressure
- Cholesterol
- Lung function
- Hand Arm Vibration Syndrome (HAVS)
- Skin diseases
- Hearing



Mobile facilities such as these are available for hire and can visit construction sites and offices. It can be made available to employees and Contractors with confidentiality maintained.



1. HEALTH AND WELLBEING

GP No:
1.2

‘IN CASE OF EMERGENCY’ INFORMATION

The In Case of Emergency (ICE) information stickers can be stuck to the side of a safety helmet, on the reverse of an ID badge/pass etc. They are completed by the individual and contain their personal information for use in the case of an emergency. This includes medical conditions and emergency contact details of next of kin.

If someone was to be found unconscious or unable to communicate, the information contained within the ICE sticker can quickly be reviewed by first aiders or emergency services.



1. HEALTH AND WELLBEING

GP No:
1.3

UV MONITORS

The HSE recently commissioned research that identified that construction workers are an 'at risk' group for developing skin cancer, due to their levels of sun exposure.

UV monitors, such as watches, can be used to increase awareness of the risks to site operatives who spend a lot of time working outside in direct sunlight.

UV monitors indicate the level of sun exposure, to warn against harmful UV rays. In the example shown, the UV level can be determined by comparing the centre of the dial to the four segments on the 'watch face'.

Avoid monitors which may be stored in pockets as these may not always provide an accurate reading.

Benefits :

- Provides people with personal UV level information to encourage use of appropriate sun protection, reducing the risk of skin cancer.
- Reduces potential for illnesses such as sunstroke.
- Improves individual's health and wellbeing.



2. NOISE AND VIBRATION

GP No:
2.1

MACHINE MOUNTED VIBRATING COMPACTION PLATE – HAVS REDUCTION

This good practice promotes the use of a machine mounted vibrating compaction plate for reinstatement works. This tool is attached to an excavator meaning that risks associated with Manual Handling and Hand Arm Vibration Syndrome (HAVS) are completely eliminated.

When used this way, the operator is positioned further away from the machine, reducing exposure to noise.

It is also beneficial from a construction point of view as it is more versatile and can be positioned more accurately than by hand.



2. NOISE AND VIBRATION

GP No:
2.2

HAND ARM VIBRATION (HAV) MONITORING

A number of HAV measuring systems are available, to assist with the management of vibration and exposure by operatives. They can be configured to measure the tool or the operative, and data can be downloaded for analysis. They also act as warning devices to operatives, advising them of high levels of vibration and when to stop using the tool. Equipment tags can also be fitted to manage recommended exposure limits.



2. NOISE AND VIBRATION

GP No:
2.3

NOISE DOSIMETER

It can be difficult to measure an individual's exposure to noise when they move between locations on site where noise levels differ.

Construction sites present particular difficulties, as the use of noisy plant and equipment can be intermittent and vary from day to day.



The noise dosimeter is a small light weight unit which can be worn on an operatives shoulder (as pictured). The device collects the noise measurement data throughout the day. The data is then downloaded using the Dosimeter's specific software and analysed to identify exposure levels, from which the correct level of hearing protection, required for that environment, can be determined.

A daily noise exposure diary should be used in conjunction with the Dosimeter, to identify where they were located when particularly high noise levels were recorded.

Note – Use of the Dosimeter does not negate the need for a site and plant noise assessment.



2. NOISE AND VIBRATION

GP No:
2.4

PERSONAL FLASHING NOISE INDICATORS

Unlike traditional noise dosimeters, which require the data to be downloaded when the wearer returns to the site office, the new generation of personal noise indicators continually measure the changing noise levels as the wearer moves around the construction site.

If the wearer enters an area where the noise levels are potentially harmful, the monitor alerts the wearer that hearing protection must be worn.

As these noise indicators are light weight, and are designed to be clipped onto PPE, they can be positioned close to the wearer's ear so as to give an actual (at ear) decibel reading.



3. SITE WORKS MONITORING

GP No:
3.1

TEMPORARY WORKS CHECKS AT THE POINT OF WORK

Installing Temporary Works notice boards at the point of work, allows the Temporary Works Supervisor (TWS) and Temporary Works Coordinator (TWC), to ensure the installation meets the requirements of the temporary works design.

The TWS then signs the daily check sheet to confirm the installation remains safe to use.

In addition auditors, site managers and visitors can easily carry out a Point of Work assessment to provide assurance that Temporary Works are both compliant with the design and are safe to use.



4. PLANT AND EQUIPMENT

GP No:
4.1

REMOTE OPERATED CUT-OUT SWITCH (ROCS) DEVICE

The ROCS is an innovative product that has been designed to reduce the risk of accidents that involve operated plant.

ROCS can be fitted on any hydraulically operated machine. It also acts as an immobiliser when the machine is stored, preventing theft.



The key fob is used by the Banksman in an emergency to stop a machine's hydraulics. An alarm also sounds when the machine has been isolated. The device can be used within a range of approximately 40m.

Note – When using such devices ensure they cannot be adversely affected by electromagnetic induction, which may result in mal-operation.



4. PLANT AND EQUIPMENT

GP No:
4.2

BANKSMAN ALLOCATED TO SPECIFIC PLANT & SIGNAL COMMUNICATION FORM

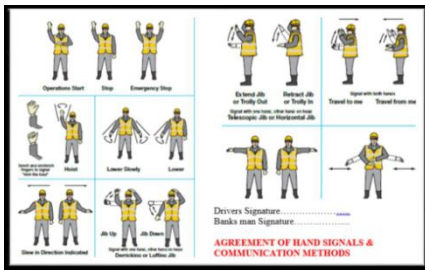
Note - when selecting a method of Banksman identification, the Principal Contractor should note that National Grid sites use both yellow and orange high visibility PPE as standard and, therefore, an alternative colour should be considered for Banksman identification.

There are a number of Banksman identification systems, e.g. different coloured helmets, jackets, waistcoats etc. The method detailed below can be used in conjunction with any of the above identified systems.



One contractor has developed a new good practice for vehicular control, as follows:

- The Banksman provides the plant operative with a photograph of himself, which is fixed to the machine.
- The plant operative gives the Banksman an armband to wear, which is specific to that machine.
- They both sign the Banksman signal communication form to ensure they both agree the signals to be used / work to be undertaken.
- Once the Banksman's duties have finished, the armband is returned to the plant operative and the Banksman removes his photo I.D card from the machine.



4. PLANT AND EQUIPMENT

GP No:
4.3

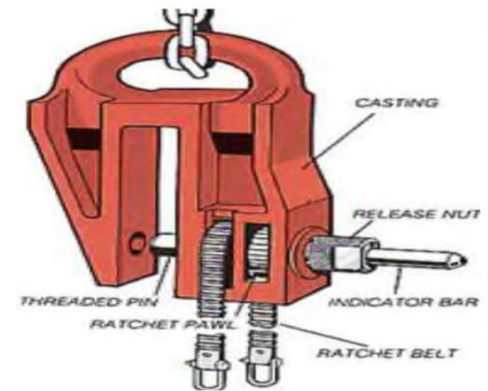
SLOW RELEASE RATCHET CLAMP FOR SHEET PILING

The use of a 'Slow Release Ratchet Clamp' is considered to be good practice when installing sheet piles.

The slow release Ratchet Clamp requires the operative, working from a safe location, to pull the ratchet belt via the ratchet pawl a minimum of six full passes to enable the threaded pin to be released. This ensures a slow and controlled release operation.

Additional benefits:

- Removes the need for 'working at height'.
- Prevents unintended release of the sheet pile.



4. PLANT AND EQUIPMENT

GP No:
4.4

CONCRETE SOCKS

Concrete socks, fitted to concrete delivery vehicles, avoid the need for concrete wash-out skips on site. This has the benefit of saving money on skip hire, concrete wash-out management and concrete disposal costs.

The concrete sock is simply fitted to the end of the chute, which prevents spillages occurring during transit. After delivery, the lorry returns to its batching plant, where it can be washed out more efficiently. As a result, this negates the need for the site to manage residual waste materials.

Additional benefits are:

- Eliminates the risk of fines due to potential contamination from run off and pollution.
- Cleaner deliveries, eliminating potential complaints due to spillages.
- Removes the need for the operator to work at height, whilst manually washing out the chute.
- If this is not achievable, see Expected Practice 'Neutralisation of Concrete Wash Water'.



4. PLANT AND EQUIPMENT

GP No:
4.5

ROBO CUT

A remote control brush cutter called 'ROBO CUT' was used to clear dense undergrowth on a very steep slope; the advantages are:

- Eliminates the need for operatives to work on steep slopes to complete the task manually.
- The operative controls the equipment at a safe distance via remote control.
- Can be used on a variety of ground conditions, due to its size and track displacement.



4. PLANT AND EQUIPMENT

GP No:
4.6

BOOT WASHING AREA

Installing a boot washing area, is a further control measure to keep site cabins and welfare areas clean and tidy.

In addition to the existing brushes, a flow of water provides extra cleaning which is then captured within a tank below. The result is a clean boot which does not then create dirt on walkways and within cabins.

In addition, this ensures that the sole of the boot is clean and maximises grip efficiency, reducing the likelihood of slips, trips and falls.



4. PLANT AND EQUIPMENT

GP No:
4.7

TEMPORARY FOUNDATION SYSTEM FOR CABINS

A reusable foundation system, having the ability to support modular buildings of all manufacture in various single, double and treble storey configurations, is now available.

This solution has been designed to be used in both temporary and permanent situations. This system incorporates incremental packers to offset any fall of ground conditions and can be used on a variety of surface types.

Additional benefits are:

- Made from recycled materials and is 100% recyclable.
- Quick and easy to install.
- Can be installed in all weather conditions.
- Lightweight, making them easier to handle.



4. PLANT AND EQUIPMENT

GP No:
4.8

FENCING & BARRIERS ANCHORED BY AGGREGATE

Temporary fencing and barriers (e.g. temporary ISS fencing and chapter eight barriers) can be supported and anchored by one tonne bags filled with aggregate (such as type one stone) that will be used later on the project. Previously pre-cast concrete blocks would have been used for this purpose, which required extensive handling and additional cost.

The size of the bags makes the fencing very strong and is suitable for use on ISS sites. Once they are no longer required, the stone is used on site so no additional handling is needed to remove the bags from site. The reuse of aggregate on site, provides a number of benefits to the project.

Benefits:

- Reduces handling
- Reduces waste
- Provides cost savings



Proposed method using
aggregate



Previous method using
concrete blocks



4. PLANT AND EQUIPMENT

GP No:
4.9

WOOD MUNCHER

Normally the packaging for Gas Insulated Switchgear (GIS) equipment is in the form of large ply sheets, which are stacked in skips for removal to a recycling facility. These large sheets take up a lot of space and do not utilise the skip to the full capacity.

The Wood Muncher is an attachment to an excavator which crushes and munches the wood packaging (under a waste exemption, which is free from the Environment Agency). It has teeth which break down the wood in to smaller pieces. The smaller pieces then fill the skips instead of leaving large voids. On average, SEESA experienced using one skip instead of three for the same amount of waste wooden packaging crates.



Benefits:

- Reduced volume of waste wooden packaging from site.
- Less skips required – more sustainable and reduced cost.



4. PLANT AND EQUIPMENT

GP No:
4.10

SAFETY STAND DOWN VEHICLE CHECKS

During winter and summer stand-down events, full compliance checks are undertaken on company vehicles, including company cars.

All company vehicles are checked for roadworthiness, condition and housekeeping. Tyre and windscreen fitters are on site to fix minor defects such as chips to windscreens and to replace tyres. Advisory notes are provided to non-compliant vehicles if necessary.

Following the checks, a feedback session is delivered to the drivers including a presentation on driver safety and recognition of the best presented vehicles in the fleet.



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4. PLANT AND EQUIPMENT

GP No:
4.11

TAG POLE

The tag pole is designed to reduce hand and finger injuries, by avoiding pinch points, while working with suspended loads. Opposing hooks grab the slings and taglines to help manoeuvre cable slung loads. The push pole can also be used to push against flat surfaces, corners or rounded edges of suspended loads.

The tag pole ensures space is maintained between the load and the operative, thereby minimising the risk of crushing injuries.



4. PLANT AND EQUIPMENT

GP No:
4.12

SAFE ESCAPE TICKER TAPE



For gas sites, atmospheric monitoring is undertaken to detect the presence of harmful gasses. Should a gas escape occur, an alarm will sound to alert operatives to the presence of gas.

By attaching a piece of ticker tape to the existing monitors, operatives can quickly determine the direction of any prevailing winds and, therefore, the area of the site that must be avoided.

Operatives are briefed on the emergency plan, ensuring they know to consider the ticker tape and wind direction if an alarm is sounded. This enables them to muster to an appropriate place of safety, away from prevailing winds, as quickly as possible.



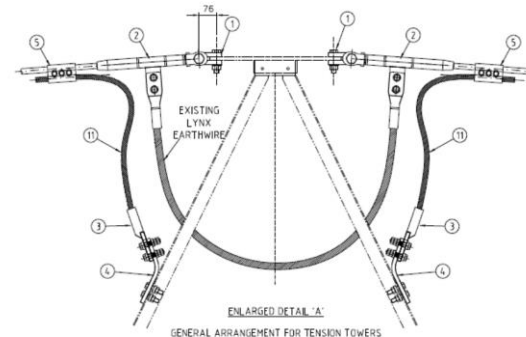
4. PLANT AND EQUIPMENT

GP No:
4.13

POLY ABRASIVE WHEEL

Traditional methods of removing a patch of paint from a tower leg to enable a good electrical connection between earth and the tower body have involved a grinding wheel, which require a grinding wheel and hot works controls to be in place.

Use of a Poly Abrasive Wheel, instead of a standard grinding disc, significantly reduces risks associated with the use of a standard grinding wheel. There is an additional benefit in that the quality of work is improved, owing to the minimal impact on the steel structure.



4. PLANT AND EQUIPMENT

GP No:
4.14

MECHANICAL STAIR CLIMBER

On many sites there has been no alternative but to manually lift items up staircases or set up lifting equipment to lift items from one floor to another. The use of this type of device, removes the manual handling / fall risks involved with lifting large items up stairs.

Such stair climbers are operated remotely and are mechanically driven with the capability to lift up to 400kg.



Note – where remotely operated systems are proposed, consideration must be given to the potential for radio interference with substation equipment. Emergency stop buttons must also be incorporated.



4. PLANT AND EQUIPMENT

GP No:
4.15

HYBRID POWER UNITS

The use of diesel generators to power site compounds presents significant impacts to the environment, including:

- increased Carbon Dioxide (CO₂)
- Nitrous Oxide (NOX) emissions
- Handling of Diesel fuel
- Potential spillage / leakage
- Environmental noise impacts

The hybrid power unit detects when the electrical demand reaches a low threshold. When it decreases sufficiently, the unit turns off the diesel generator and meets the demand via its internal energy storage bank.

When a higher electrical supply demand is detected, the diesel generator is automatically restarted, transferring the load to the diesel generator unit.

Any excess capacity recharges the hybrid unit.

Monthly reports are generated to provide emission reduction data and indicate fuel saving data.



4. PLANT & EQUIPMENT

GP No:
4.16

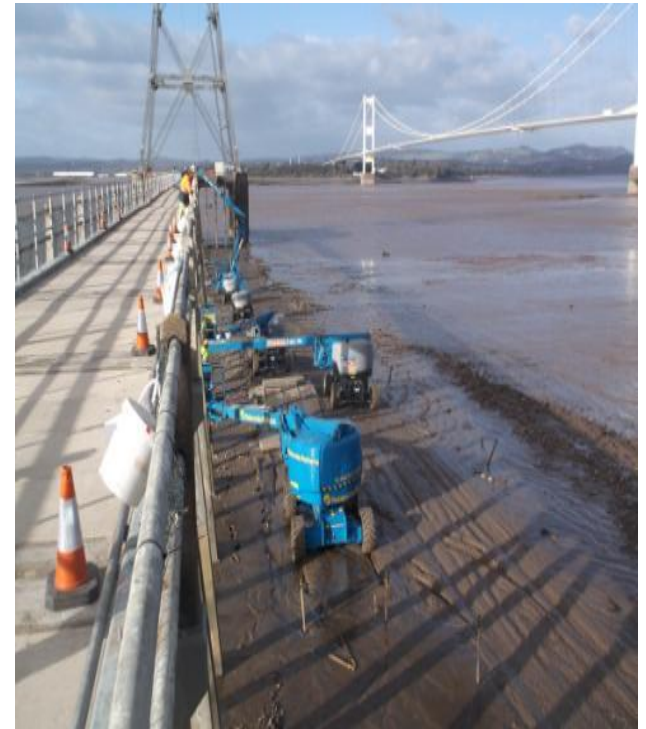
PLANT MANGEMENT FOR ENVIRONMENTALLY SENSITIVE OPERTIONS

Working in or near to a watercourse poses a number of health, safety and environmental risks. A considerable risk to the environment can occur as a direct result of spills, leaks or plant breakdown.

It can be difficult to control accidental spillage during fault conditions (i.e. hydraulic oil pipe failure during use). However, this problem can be mitigated by filling plant with biodegradable oil, in line with the plant manufacturer's instructions. Use of such oil reduces the potential for pollution to the water course in the event of a hydraulic oil pipe failure.

This does not negate the need for an enhanced planned preventive maintenance programme for plant, which ensures the risk of pollution is further reduced.

In sensitive areas, close to water courses, it is prudent to consider battery powered plant.



4. PLANT AND EQUIPMENT

GP No:
4.17

RETRACTABLE POLE BARRIER SYSTEMS

For exposed sites, or where 'Chapter 8' crowd barrier systems are unsuitable (i.e. due to high wind conditions) alternative barrier systems may be considered.
(Note – approval must be sought on a site by site basis).

This retractable barrier system can be extended from 1.1m to 2.1m, negating the need for barriers to be overlapped.

It is light weight and, therefore, reduces the risk of possible manual handling injuries.

Due to the size of the individual components of this system (cones and poles) the volume of storage is reduced, when not in use.



4. PLANT AND EQUIPMENT

GP No:
4.18

SCAFFOLD GROUND ANCHORS

There are now a number of ground anchors available on the market which replace the traditional duckbill type ground anchors.

These new methods are either screwed or hammered into place and are easier to install and remove than traditional methods.

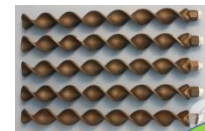
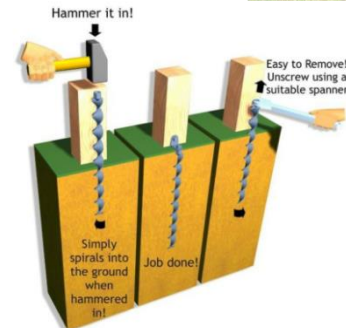
Installations can be performed by one person using a portable, hand held machine, which drives the anchor into the ground or manually (with a spanner) where ground conditions allow.

This eliminates the need for compressors to be transported to the scaffold location.

Benefits are:

- Easy to install and remove
- Reduction in ground damage
- Reusable

Note – Prior to work commencing the contractor must comply with HSG47.



4. PLANT AND EQUIPMENT

GP No:
4.19

INSTALLATION OF CAMERAS ON PLANT AND MACHINERY

Following a recent fatality on an HV construction site, the project team suggested the retro-fitting of forward and rear cameras to dumpers, and other plant and machinery, to improve the operator's visibility.

Where plant is hired, this can be stipulated as a requirement in the hire agreement.

Note – The installation of such cameras does not replace the need for a banksman.



4. PLANT AND EQUIPMENT

GP No:
4.20

MULTI CABLE AND PIPE SEALING SYSTEM

A cable duct sealing system is available which can be used for sealing cables and pipes in ducts or bore holes, allowing multiple cables or pipes in one duct. This system also allows re-entry of the seal to add or remove cables or pipes as required.

Benefits are:

- Suitable for any shaped duct / bore hole / opening
- High levels of gas and water tightness
- Resistant to rats
- Solvent free
- Chemical resistant and non corrosive
- Seals a variety of materials (i.e. PVC, PE sheathed cables and pipe work)



5. AVOIDANCE OF 3RD PARTY SERVICES

GP No:
5.1

HIGH RISK AREA CONTROL

The purpose of introducing the High Risk Area Control is to ensure all personnel are aware of the services in the working location and be able to see its route direction.

Awareness of underground or overhead services are clearly highlighted, route drawing and proximity to excavation works are displayed with 'YOU ARE HERE'.

Tall yellow service markers indicate the type of service and are located at each end of the service within the CDM working area , clearly showing the route direction.



Install service location drawings showing the exact position of the services and surrounding hazards.



Service markers to be installed at each the end of the services within the CDM working area.



5. AVOIDANCE OF 3RD PARTY SERVICES

GP No:
5.2

ACCESS CONTROL FOR HIGH RISK AREA

To ensure all personnel are aware of specific high risks within the CDM area, the area is cordoned off with authorised entry only through the yellow access gate. The access is clearly marked as a high risk area with suitable signage.



6. EXCAVATIONS & CONFINED SPACES

GP No:
Xx

**This page is intentionally left blank.
The practices in this section have been moved to the
Expected Practices section – see Appendix A.**

7. WORKING AT HEIGHT

GP No:
7.1

BESPOKE TOOL BAGS WITH INTERNAL TETHERS

Following a number of near misses, where tools have been dropped from tool bags whilst operatives are working at height, a bespoke tool bag with internal tethers has been developed.

The newly designed tool bag allows tools to be tethered whilst in the bag, meaning they can be tethered at all times, whilst working at height.

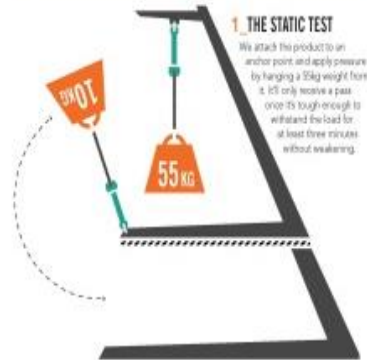
Note, it is intended that tools should be tethered during all work at height activities. This includes, overhead line projects and substation projects.

TOOL TETHERING

DESTRUCTION TESTING

WE USE TOP-NOTCH MATERIALS TO MAKE OUR PRODUCTS. THEN WE PUSH THEM OVER THE EDGE TO FIND OUT JUST HOW STRONG THEY REALLY ARE.

It's one thing to design tool safety products that are aesthetically pleasing but it's something else entirely to craft them so they can handle the pressure at height. Our products never fail in the event of a drop and here's how we guarantee it.



2. THE DYNAMIC TEST

Once a product passes a static test it gets put through to pass with a dynamic test. We attach 10kg to a fixed rope, release it and release the weight into a four meter drop that generates an impact force of 220kg (2059N). And we don't just do it once, we only give the green light when it can survive the impact at least 3 times! For technical people out there that means our products have an unbelievable 47 times safety factor!

Available exclusively at www.enfieldsafety.co.uk



7. WORKING AT HEIGHT

GP No:
7.2

USE OF HSE's WAIT TOOL

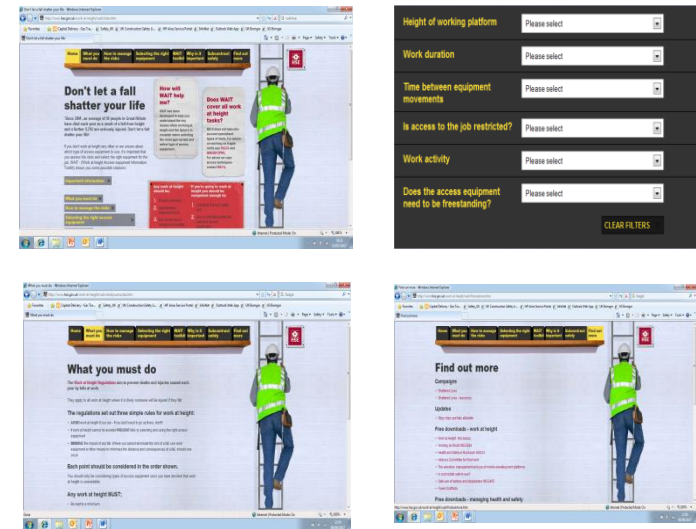
When undertaking work at height, all sites can utilise the HSE's WAIT Tool, which can be accessed via this link:
<http://www.hse.gov.uk/work-at-height/wait/wait-tool.htm>

‘WAIT is a free online toolkit of advice and guidance aimed at people who work at height. WAIT will help people understand the risks and issues when working at height and consider some of the most common types of access equipment.’

The WAIT Tool provides a series of ‘drop down lists’ which provides you with guidance relevant to the task you are undertaking and advises the most appropriate type of access equipment to use.

Using the HSE WAIT tool is not compulsory, but the guidance it produces is intended to give you practical advice on how to comply with legislation.

Enter the details of your WAH activity and the WAIT tool provides guidance



The image displays three screenshots of the HSE WAIT tool interface. The top screenshot shows the 'Don't let a fall shatter your life' section, which includes a warning about the risks of working at height and a list of common types of access equipment. The middle screenshot shows the 'What you must do' section, which provides detailed guidance on the requirements for working at height, including the need for a competent person and the use of appropriate equipment. The bottom screenshot shows the 'Find out more' section, which provides links to further resources, including the HSE website and the WAIT tool itself.



8. LIFTING OPERATIONS

GP No:
8.1

STORAGE OF LIFTING ACCESSORIES

A purpose made storage rack for lifting accessories has been sourced which ensures lifting accessories are stored neatly in a designated area. Once on the rack, they can be chained together and locked, to prevent unauthorised use.

The pegs are set at a height that enables easy placement and retrieval, reducing the risk of musculoskeletal injuries.

A test certificate is supplied with the rack. Each hook has been proof loaded to 50kg but has a recommended loading of 25kg.

Heavier lifting accessories should be weighed to ensure they do not exceed the maximum loading.



8. LIFTING OPERATIONS

GP No:
8.2

CAGES FOR THE TRANSPORTATION & STORAGE OF LIFTING EQUIPMENT

The use of cages for the transportation and on site storage of lifting equipment is considered to be a good practice.

The cages are delivered to site, with lifting equipment safely hanging up inside and ready for immediate use.

Once the cage is unloaded to its permanent location on site, it ensure lifting equipment continues to be stored safely and securely in a dedicated storage facility.

After the project is complete, the cages can be reused at another site.



9. TRAFFIC MANAGEMENT

GP No:
9.1

PEDESTRIAN AND PLANT INTERFACE WARNING SYSTEMS

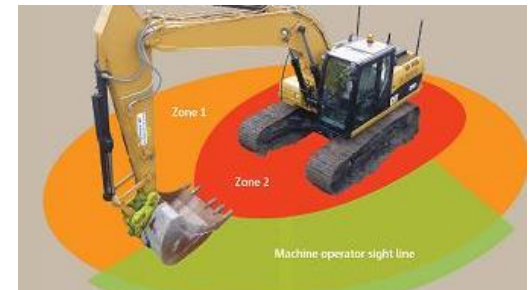
Pedestrian and plant interface is a significant risk during construction activities.

There are a variety of plant / equipment / site operative interface warning systems that help to reduce the risk of incidents.

There are a variety of warning systems available which have audible alarms, personal vibration warnings or automatic plant / equipment cut-off systems, that are initiated when plant and people are in close proximity of one-another.

Benefits:

- Help safeguard personnel from plant and machinery hazards.
- Reduce the risk of workplace transport accidents.



10. PERSONAL PROTECTIVE EQUIPMENT

GP No:
10.1

VEHICLE WITH PPE DRYING FACILITIES / TOOL STORE



To ensure that PPE continues to be dry and comfortable for site operatives working in poor weather conditions, PPE drying facilities should be provided.

This integrated PPE / Tool Store provides a mobile facility which may be considered suitable for short duration projects.



11. OUR ENVIRONMENT

GP No:
11.1

GROUND PENETRATING RADAR (GPR) FOR NON-PENETRATING BADGER SURVEY

Between December and June, construction activity is not permitted within a 30m radius of a badger sett, which can result in project delays.

However, with permission from Natural England, a non invasive GPR survey can be undertaken to determine the location of the badger setts.



Once their location is established, an early licence application can be submitted to National England, to minimise potential delays to the project. A 'live-dig' can then be undertaken (after June) in accordance with the licence conditions.



11. OUR ENVIRONMENT

GP No:
11.2

FULLY BUNDED COSHH STORE

There are now a number of bunded COSHH Stores available. These walk in units are manufactured and designed for secure storage of chemicals and other hazardous substances that can cause harm to the environment.

Features and Benefits:

- Secure container style padlock-able store, for secure storage and control.
- Fully vented to correct standards.
- Heavy duty galvanised grid mesh floor to allow for spillage run off.
- Fork lifting points.
- Lifting lugs - for lifting with crane.
- Portable' easy to re-site in a new location
- Available in a variety of sizes



11. OUR ENVIRONMENT

GP No:
11.3

MOBILE PRESSURE WASHER FOR BIOSECURITY

On National Grid projects, there are a number of land owners who have requested biosecurity controls to be put in place, to minimise the risks to their livestock of contracting diseases and / or to crops being affected by invasive plant species.

These portable low pressure washer units can be placed at high risk locations, along with a water bowser, to clean vehicles and boots that may be contaminated.

The units have a pressure setting of 60psi and a capacity of 90 litres. They are powered by a 12v battery, allowing for easy installation and use at remote locations.



11. OUR ENVIRONMENT

GP No:
11.4

DRIP TRAY TRAFFIC LIGHT STICKERS

A sticker identification system for plant and equipment has been developed. Stickers are placed on each item of plant or equipment, which then identifies whether a drip tray is required:

- **Green sticker** – equipment with an integral bund that is not compromised in any way – no drip tray required.
- **Amber sticker** – equipment does not have an integral bund or has one that has been damaged - drip tray required during use. (Drip tray may not be required when in storage).
- **Red sticker** – equipment does not have an integral bund or has one that has been damaged – drip tray required at all times, including when in storage.

Note: The Red sticker also relates to plant and equipment that has oily engine components or apparatus with greased parts that are exposed to the elements and which have the potential for hydrocarbon wash off to occur.

- **Black sticker** – this is when equipment cannot be used with a drip tray, however does pose a risk of hydrocarbon release when stored out on site.

Note: All leaking plant / equipment must be quarantined and repaired prior to further use.



12. SUSTAINABLE CONSTRUCTION

GP No:
12.1

SOLAR WATER HEATING FOR SITE CABINS

All new cabins must be eco-cabins grade B or above (on all projects of greater than 2 months duration).

For existing cabins that are not eco-cabins, we have the opportunity to retro-fit sustainable solutions.

Roof mounted solar powered systems are available for existing site accommodation.

The benefits are:

- Reduces energy consumption
- Reduces energy costs
- Reduces CO²e emissions
- Reduces impact on climate change



12. SUSTAINABLE CONSTRUCTION

GP No:
12.2

MARKIT

Where there are surplus materials or assets at a National Grid (NG) site, they can be advertised on a new, externally hosted, website called Markit. The advertised items can then be used on other NG sites that can utilise those materials or assets, providing it has been agreed by assessment (e.g. DH15) that they are fit for that specific purpose, even if their design life and / or specification is not consistent with current standards.

Request access to the website by emailing: box.MARkit@nationalgrid.com



Once you have access rights use this link to view the Markit site:

<https://ukcsafety.rheadnet.com/Sustainability/MARkit/>

Note - this site can be accessed by either NG or Contractor employees.

Additional benefits are:

- Cost savings for both projects.
- Reduces the quantity of waste going to landfill.
- Reduces in the number of vehicles on the road
- Protects the environment.
- Material reuse has a reduction of CO²e for both parties.



12. SUSTAINABLE CONSTRUCTION

GP No:
12.3

SMARTWASTE

Save money by measuring and reducing your waste. There are a number of SMARTWaste companies who provide an online reporting platform that can help organisations reduce their waste output, improve their impact on the environment and reduce costs.

SMARTWaste can be used to benefit both the organisation and it's construction projects.

Benefits are:

- Reduction in project waste, energy and water costs.
- Set and monitor your targets to reduce your site based impacts.
- Save time in tracking and reporting against your sustainability targets.
- Efficient materials management means less transport on local roads and less waste going to landfill.
- Ability to compare project and regional performance.
- Access to all your project information in one place.
- Obtain Code for Sustainable credits and British Research Establishment Environmental Assessment Method (BREEAM) credits.



12. SUSTAINABLE CONSTRUCTION

GP No:
12.4

REED-BED WATER TREATMENT SYSTEM

At long-term sites with enough space, a more sustainable solution is to treat effluent waste on site. This is a two stage process that uses a bio-digester unit and a reed-bed filtration system. This eliminates the need to remove effluent waste from site.

The bio-digester unit separates the solids from liquids and micro-organisms degrade the sewage to a clear effluent. The clear effluent is then pumped onto a reed-bed, which acts as a filtration system that removes the remaining toxins from the liquid. Note - a discharge consent is required from the Environment Agency if the discharge is within 10m of a watercourse.

Benefits are:

- On a 30 month project, a cost saving of 74% was achieved.
- On NG owned sites, there may be the potential for the reed-bed to be left in situ after completion.
- Negates the need for sewage tanks on site.



12. SUSTAINABLE CONSTRUCTION

GP No:
12.5

RECYCLED PLASTIC BOG MATS

When purchasing new bog mats, the preferred option is recycled plastic bog mats, as these eliminate the potential for buying unsustainable hardwood timber versions.

The performance of recycled high-density polyethylene bog mats has been shown to be comparable to traditional hardwood alternatives. The recycled plastic bog mats are extremely tough and durable, they are inert, do not conduct electricity, repel water and do not rot. They last for at least as long as traditional bog mats and can be remade into new bog mats once they reach the end of their life, creating a cyclical economy.

Benefits are:

- Eliminates the possibility of using illegal timber.
- Less habitat destruction than hardwood mats.
- Saves CO²e absorption capability.



12. SUSTAINABLE CONSTRUCTION

GP No:
12.6

GROUND REINFORCEMENT CELLULAR SYSTEMS

Providing traffic access over soft landscapes, can cause damage to the land, hence traditional concrete hard standings are often installed.

A sustainable alternative solution is the use of interlocking ground reinforcement cellular systems, which hold the chippings in place and provide stable support.

Benefits are:

- Variety of products and grades available for different installations / wheel loads.
- Approximately one sixth of the cost of traditional roadways.
- Quick and easy to install.
- Reduces surface run-off / potential or pollution.
- Negates the need for traditional drainage systems and is compatible with Sustainable Urban Drainage System (SUDS).
- Made from recycled materials.
- Reduces carbon footprint.

Note – Designers must ensure the earthing specification is not adversely affected in the event that the depth of chippings is reduced.



12. SUSTAINABLE CONSTRUCTION

GP No:
12.7

HEAVY LOAD BEARING POROUS PAVERS

Heavy Load Bearing Porous Pavers are manufactured from recycled plastics. These products are available in a variety of duties with the heaviest duty being capable of withstanding heavy vehicular weights such as coaches, dustcarts and HGVs.

Key benefits:

- These products are typically lightweight for easy handling, minimising manual handling issues.
- The installation method requires the sections to be interlocked.
- After the installation is complete, the grid is filled with granular materials (i.e. stone chippings) which provides stability and strength.
- Variable weight bearing capacities are available.
- Surface water is absorbed through the granular filling, minimising the need for additional drainage.
- Cost effective.
- Uses recycled plastic.
- Significant carbon savings compared with equivalent concrete / tarmac solutions.



Note – Designers must ensure the earthing specification is not adversely affected in the event that the depth of chippings is reduced.



12. SUSTAINABLE CONSTRUCTION

GP No:
12.8

RAIN WATER HARVESTING

Rainwater can be harvested by connecting conventional plastic downpipes to underground ducting which feeds into an underground storage tank, or by connecting to an above ground storage tank.

Harvested water can be used to replace a mains water supply for all activities except where the water will be used for consumption.

Benefits are:

- The harvested water can reduce site drainage costs.
- Can eliminate the need to discharge rainwater from the site.
- Reduces the risk of silt being released or water courses becoming polluted.

Note - When adopting this Good Practice, the Contractor must provide a quality specification for design and build.



12. SUSTAINABLE CONSTRUCTION

GP No:
12.9

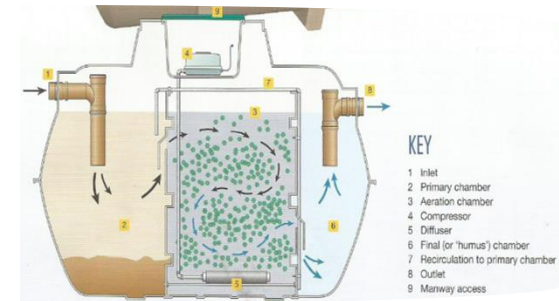
SEWAGE TREATMENT PLANT

A sewage treatment plant can be a preferred option, instead of a traditional effluent tank, for temporary or permanent locations. This can significantly reduce costs and carbon impact associated with traditional effluent waste disposal.

Such units allow the treated water to pass into a second aeration chamber, to remove the dissolved constituents, ensuring the effluent is clean and reaches national consent standards, prior to discharge.

Benefits:

- Tested and certified to BSEN12566-3.
- No discharge consent required (within stated parameters).
- Low running and maintenance costs (requires inspection and maintenance in line with manufacturer's instructions).
- 50 year design life & 25 year structural guarantee.
- Only needs to be emptied once a year by a registered waste carrier.



12. SUSTAINABLE CONSTRUCTION

GP No:
12.10

SOLAR POWERED SECURITY CAMERAS

Unmanned Solar Powered Security systems are now available which provide 360° panoramic images of the surrounding area.

These images are then relayed back to a remote monitoring station, who are able to communicate with any identified persons.

The solar panels charge a 12V battery during the day, which is used to power the security equipment throughout the night, removing the need for a diesel powered generator.

The benefits are:

- Reduces the carbon footprint
- No harmful / noisy emissions
- Removes the risk of spills/leakages

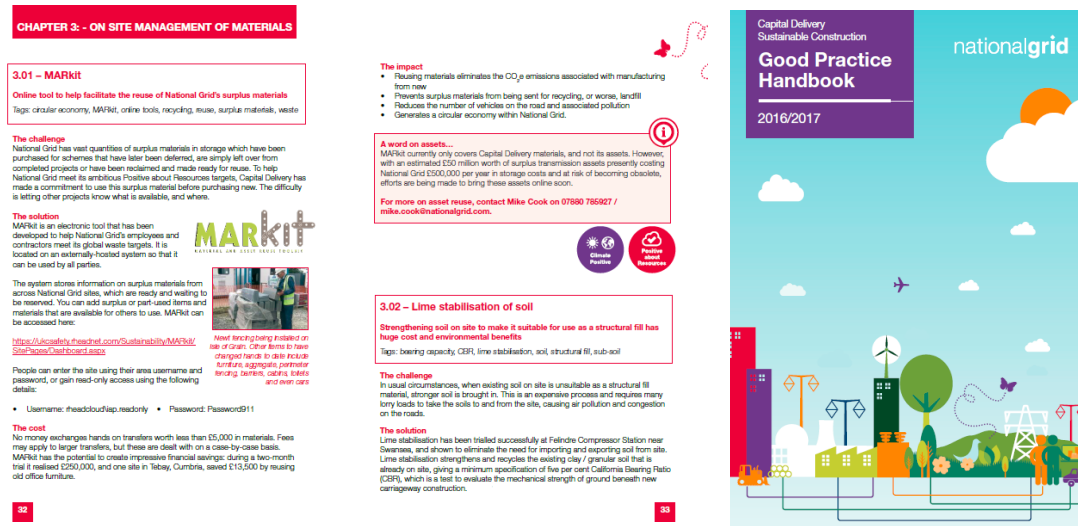


12. SUSTAINABLE CONSTRUCTION

SUSTAINABLE CONSTRUCTION GOOD PRACTICE HANDBOOK

All Sustainable development Good Practices can be found within the Sustainable Construction Good Practice Handbook. For each Good Practice, the sustainable benefits (including any cost savings) are clearly defined.

Further details of how these good practices can be implemented can be found within the Sustainable Construction Good Practice Handbook, which is available on Huddle via the link below.



<https://nationalgrid.huddle.net/workspace/23931969/files/#/folder/42370951/list>



Good Practice Handbook and Guidance

Appendix A

Expected Practices

Use the following link:

<https://nationalgrid.huddle.net/workspace/23931969/files/#/folder/41101704/list>



Good Practice Handbook and Guidance Appendix B Safety and Environmental Alerts / Bad Practices

Use the following link:

<https://nationalgrid.huddle.net/workspace/23931969/files/#/folder/41101707/list>

