Houlihan & Co. (Excavations) Limited
OHSEQ Management System

HOULIHAN & CO. (EXCAVATIONS) LTD
Civil Engineering Contractors
Specialists in Roads Sewers & Groundworks

Project		**Basset Farms, Horsmonden**	
Activity		The works are part of the S278(Bellmouth) agreement between Kent Highways and Persimmon Homes for the new development currently under construction at Goudhurst Road. Other works at Goudhurst Road involve the construction of a footpath and a tobermore wall.	
No:	Doc. Ref	M0612 – MS – 2403 Highway Work	Client: **Persimmon Homes**

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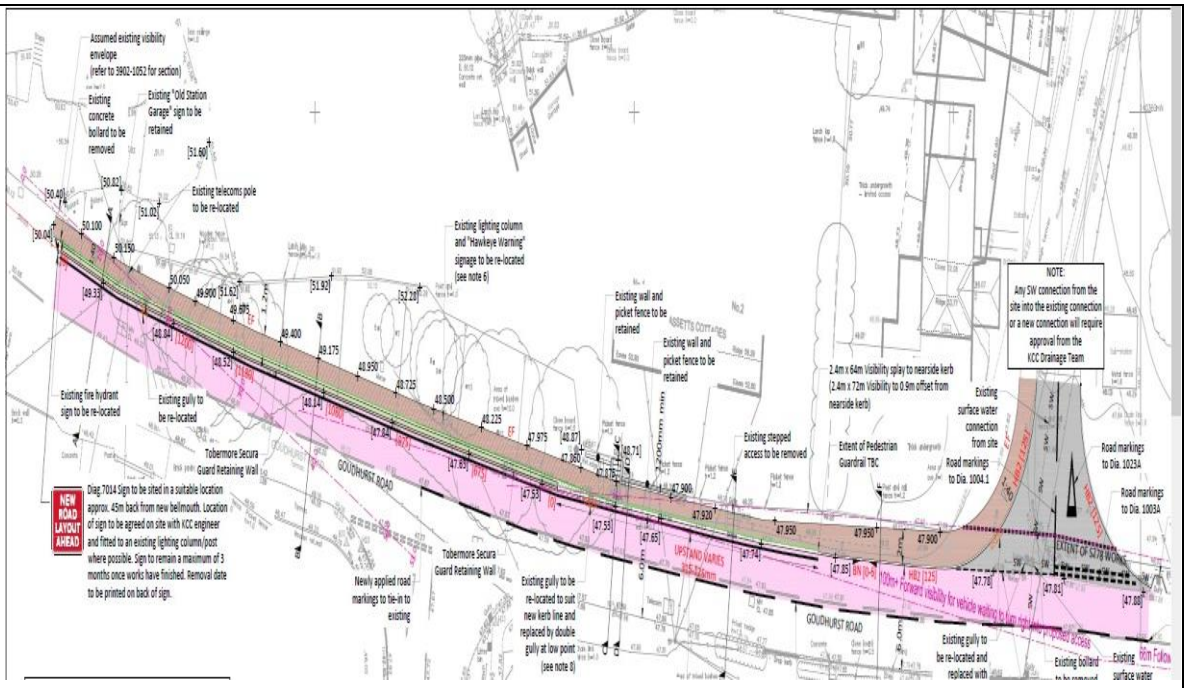
4.0	Site Description	The site is located to the north of Goudhurst Road in Horsmonden, Kent . It is approximately 1.3 ha. In the northeast and southern boundaries are residential properties, while in the east is an open field, in the north is an orchard, and in the west is Old Station Garage. Delivery and construction route to the site is via A21 and B2162. Construction traffic will head south on Hastings Rd/Pembury Bypass/A21 towards Forstal Farm Roundabout. Vehicles will leave the A21 at Forstal Farm Roundabout and take the 1st exit onto A262. Then, construction traffic will take an immediate slight left onto Lamberhurst Rd/B2162. Vehicles will then continue on B2162 for 2.4 miles and then turn right onto Goudhurst Rd. After approx. 0.5m, the site entrance will be located on the left-hand side. Applicable signs will be erected, directing traffic to the site.



Restrictions and risks of developing this phase are:

- No articulated lorries are permitted to carry out deliveries on site. Due to space constraints, the largest delivery lorries allowed are rigid lorries.
- Site access will be shared with a resident living in the site's southwestern corner.
- A road that goes from south to north on the eastern side of the site serves the residential properties on the northeastern side of the site.
- There is a Public Right of Way going from south to north that will need proper segregation and protection, especially in the project's later stages when the compound will be installed in the north part of the site. ***Note: The way to the site from the compound will have to cross the PROW and residential road. All subcontractors and suppliers will work in such a way as to maintain, as far as reasonably practicable, existing public access routes and rights-of-way during construction. Where this cannot be achieved, a suitable alternative route will be provided where practicable and will be sign-posted accordingly.***
- There is a car park that serves the residential properties on the site's southern boundary. It must be maintained and available all the time.
- There is contamination of cold tar, lead, PAH, asbestos and petroleum hydrocarbons on site. All the workers on site will be briefed on the Remediation Method Statement produced by LEAP and Houlihan's Discovery Strategy.
- There are existing services going along the residential road. Also, there are two drainage runs, one foul and one surface water, live going through the site. They will be made redundant later and connected to the site drainage system. A substation is on the southeastern side of the site.
- There is a continuous hedgerow that goes north of the side and some trees on the northeastern side of the site that have Tree Protection Order. The no-dig area and TPO fencing have already been installed. Tree protection fencing has been erected according to the TPO drawing.
- Overhead services on site and on the Goudhurst road during construction of footpath and tobermore wall.

The construction plant will only be allowed to operate between the following hours:
• 8 am to 6 pm, Monday to Friday.
• 8 am to 1 pm on Saturday (only if required as per the construction programme); and
• No work will be permitted on Sundays and Bank Holidays unless a requirement is identified under a statutory, i.e. the Energy provider & the Highways team.
This will be communicated to all site workers, visitors and deliveries.
Without prior agreement with site management, no deliveries are permitted outside working hours.
Vehicles arriving outside normal hours will be turned away, and Houlihan & Co. will not be responsible for any costs incurred.
The site is surrounded by residential properties, and vehicles entering/leaving the site must always drive with extreme caution and at a reduced speed.
The PC Site Traffic Management Plan also indicates the location of entrance/exit gates, laydown areas, and materials storage.
Vehicles will not be allowed to be reversed out of site access.

5.0	Scope of Works	**Houlihan & Co will be PC** **A Hold point has been introduced to our safe system of works company-wide,** **"Any remedial works required due to non-conformity or not to quality assurance and require remedial works that are not part of this approved safe system of works shall be risk assessed and remedial documentation produced were required".** **Drainage works** **5.1** 278 works, Bellmouth **5.2** Relocation of existing gully **5.3** Relocation of gullies to suit new kerb lines **5.4** Construction of footpath **5.5** Kerbs and edgings **5.6** Tobermore walls **5.7** Tarmac reinstatement on the road Note: **Work in front of the properties will be managed, and access for residents and emergency services will always be maintained.**

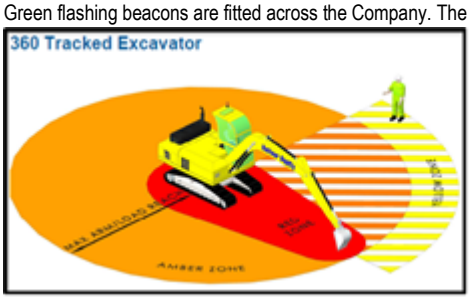
6.0	Preparation	**Pre-start on site:** • Works will start only if Kent Highways approves the Permit. • The street works team will work within the traffic management area, which will be segregated with Chapter 8 barriers. • 3-4 ways traffic lights in place. • Heras panels will protect excavations to prevent public access. • Lane closure with traffic lights. • A medium-pressure gas main is shown within the footprint of the work area. • Cadent must be notified of the works that will take place near their MP gas main. Works in the vicinity of the MP gas main will not be carried out without their approval. • Electric HV, water and other services present in the vicinity of work areas. • Once tarmac has been taken off Vac-Ex, hand digging only to take place until all services are exposed. **Pre-Start Each Day:** • A permit to work on a public highway must be completed before anyone starts working on the highway. • Permit to dig must be completed for each day or on a weekly basis. • Task Briefing to be carried out • Every morning before each shift, no operative / sub-contractor must commence work without attending a daily briefing held by the site work supervisor at the site compound no later than 0730hrs, where the day's task/s and associated risk/s will be addressed, planned and possibly challenged if operatives have any concern. • Toolbox talks must be undertaken after the daily briefing with the operatives about to engage in high-risk work, such as excavating on/near live services, deep excavation activities, work in the public highway, confined space work, etc. • Check if there are any changes to the traffic management on site. • Carry out CAT scan surveys of proposed excavation areas routinely & review existing utility plans. • Ensure there are no other trades or public works along the lines of the proposed works. • Check that all Drawings are current and are the latest issue. • Cordon off the work area from other personnel and traffic not involved in the work. • Ensure that the area of work is closed and that the public is not permitted access. • Carry out Topographical Survey: Agree to levels with client. • The team or teams involved will carry out a task-specific briefing and sign off on it. If the work is on or near live services, the prestart procedure will be followed in addition. • These RAMS must be used in conjunction with LIVE SERVICES RAMS and General RAMS

7.0	Access & Egress	• Articulated lorries are not allowed to deliver on site due to the space constrictions. • Construction vehicles would access the construction site via Goudhurst Road and exit the site using the same route • All Lorries and Traffic Movement will be banked through the gates and around the site to the area of discharge /loading via banksman, who will also be responsible for maintaining a mud-free access road. All drivers must proceed with caution when entering and leaving the site. There is a Public Right of WAY going in front of the site.

8.0	Supervision, Responsibilities and Site Organisation	• Damien Broomhall– Site Supervisor: 07920554735 • Neil Bath – Site Engineer: 07983518974 • S. Palmers – Contract Manger: 07827 767536 • R. Carroll - Construction Director: 07884 490755

		• R. Knight - Managing Director: 07775 625 421 • A. Selita - H&S advisor: 07507430655 • S. Palmers – Contract Manager: 07827 767536

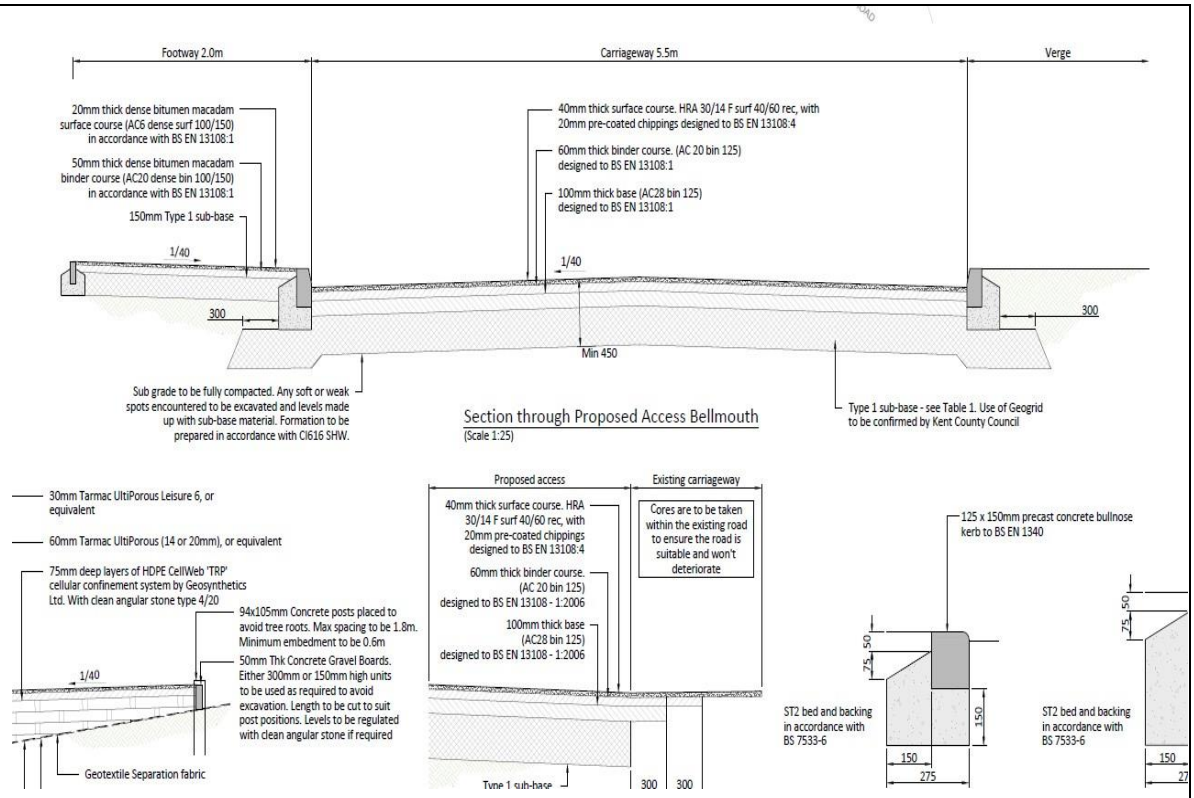
9.0	Labour, management resources & training	• Sufficient time and resources will be available to undertake the work. The works described will be undertaken by a gang of 5-8 operatives under the supervision of a competent supervisor and Site Engineer. Contracts Manager Steve Palmer will visit the site as often as required. • The Contracts Manager, Steve Palmer, will report to our Construction Director, Richard Carroll, who will visit the site regularly. The Health and Safety Advisor, Agron Selita, will visit twice monthly to monitor compliance with the Method Statement and Risk Assessments and will produce a monthly safety report that will be sent to PersimmonHomes. He will also carry out investigations of all site accidents and near misses. • The site supervisor will ensure the work area is left secure after every shift. They will inspect open excavations before work starts and record results. There is no site security. The site supervisor will carry out a weekly site inspection, environmental, Loler for lifting equipment and weekly plant checks, and arrange to check the site's security at the end of each shift. • All our operatives have undertaken safety training within the last two years. Our Managers and Directors have also attended Safety Courses. All personnel have a health and safety training schedule to undertake over the next two years to maintain our high standards. • Machine operators are all certificated to CITB standards, and copies of certification are readily available from the Head Office. • Our entire workforce has presently achieved or is undergoing on-site assessment via the CITB experienced worker route. This leads to National Vocational Qualifications in General Construction and Plant Operations for all relevant categories of plant. Our whole workforce will then be accredited under the Construction Skills Certification Scheme. • All plant operators will be either CPCS or NPORS accredited and hold an NVQ in the relevant Plant Operations category with lifting operations endorsement/ NVQ in lifting with an excavator. Please note that the NVQ is the senior qualification and is regarded as such by the HSE. The card schemes are regarded as little more than passport schemes, though the underpinning knowledge content is increasing annually. • If machines are hired with drivers, the incoming drivers will be required to have these qualifications. • All banksmen will be either NPORS trained on N403 – Vehicle Marshall, or L2 NVQ certified in Plant Operations (Construction) – Movement Guide Marshall A/506/4668 • Note- Regardless of qualification, all plant operators must be formally authorised as competent by the Houlihan site supervisor on the H&Co plant operator authorisation register. • All personnel on site will have CSCS/ CPCS/ NPORS accreditation as relevant. • A site induction will be carried out to include every operative new to the site. Our site induction will include a brief questionnaire about health problems, and the data will be held off-site securely—NI number and address. This will be separate from new starter employment details and is a first scan for signs of modern slavery.

10.0	Major Plant & Minor Plant/ Equipment	Major Plant (Typically): **Only roadworthy plant to be on the road.** JCB JS 135/140/160/220 6t/9t/10t forward tipping dumper 80/120/135 Ride on roller JCB 535 -125 Telehandler *(Refer to H&Co's site safety OHSEQ notice board for current records & registers)* Note: All Weekly Check Sheets for 360s are carried out by the machine operator and will always be available within the cab for inspection, including the most recent through examination certificate. Copies are also kept in H&Co's site office (OHSEQ board). Excavators will have to monitor cameras fixed in the rear of the machine for all-around vision. Any machine that is not fixed with a camera and is not carrying out bulk earthworks will be accompanied by a Banksman. Major Plant that does not have cameras fitted will achieve all around vision using mirrors. We will continue to promote the "thumbs up" campaign. Green flashing beacons are fitted across the Company. The new plant will come equipped.  Banksman • The banksman must be situated in a safe position and preferably outside of the operational area of the machine's fully extended boom, dipper and attachment. • The banksman must face the operator when signalling and be clearly visible to them. • The banksman must always maintain a clear line of sight with the excavator operator. • The banksman must have direct sight of the load and lifting equipment at all times during the lifting operation and have adequate visibility of the load path.

		• The communication between the operator and banksman must be continuous throughout the duration of the lifting operation Plant Operator/ 360° Machine Driver • The operator must not respond to any hand signals (or other communication) that are not clearly understood and should seek additional clarification. • Hand signals and any additional voice instructions should only be given by the identified banksman – except for an emergency stop, which can be given by any person at any time if a perilous circumstance is spotted. • If other instructions are required (other than the agreed hand signals), then the operation should be stopped. Where there is any concern about the safety of, or the need to halt, the operation, all movement (and therefore, the lifting and any operation) should be stopped until the issue has been resolved to the mutual satisfaction of both the operator and the banksman. Comprehensive <u>Minor Plant & Equipment (Typically):</u> • Block Grab • Concrete Skip/Bucket • Excavation Support Equipment • Setting out Instruments • Compressor & associated pneumatic tools • Heras Fence Panels / Avalon barrier • Shovels Inc. insulated • Hand Tools • Small electrical tools • Kerb lifter/ laying dolly • Block barrow • Pipe Lifter • Rammax • Vac Ex Minor plants will be visually checked prior to use. Any defect or failure noted during pre-use checks will be reported immediately to the site supervisor. The site supervisor will remove the equipment from use as " out of Order/service" and report it to the Plant Department for repair or replacement.

11.0	Plant/ Materials and vehicle preparation and delivery	Unless it is reasonably practicable to do so, the following safe systems of work must be followed at all times. • The Low Loader Driver will sign in at the site entrance or Site Office prior to delivering the plant. • Plant Deliveries are not to be made outside site working hrs unless previously agreed with the Site Manager. • Lone Working is not permitted, and deliveries are not to be made unless a member of staff is present on site. • Plant deliveries are not to be made in areas where adequate lighting is not present. • The vehicle collecting the plant shall be designed for the collection, transportation, and delivery of mobile plant, be it wheeled or tracked. It shall be a low-loader. • The vehicle must have a suitable means of getting the plant onto the trailer and will include designed loading ramps. • The Low Loader driver must be a competent person trained in loading/unloading all plant categories from the lorry and for its security during transport. • All loading/unloading operations shall be supervised by a competent person. The Low Loader driver shall act as the competent person. • All plant shall be loaded/unloaded onto the low loader by a competent plant operator and directed by the lorry driver. No other person shall undertake these instructions. The low-loader driver can unload the plant, provided he is qualified to do so. • During the plant loading/loading operations, all persons other than the plant operator and lorry driver shall stand away from the loading area. • During access to the lorry platform, if there is a risk of personal injury from a fall, a means of preventing a person from falling off must be installed, or a safety harness must be implemented. All such persons shall be trained in the risk of falling off the lorry platform and how to control those risks. Where clients provide access platforms/podiums, these must be used. • Prior to moving all loaded plant, it shall be adequately secured by the appropriate means, such as chains, etc., by the low-loaded driver only or assisted by others working under his instructions • The driver shall determine the route and final resting place of all plant to be loaded/offloaded before the activity commences. • The driver shall also ensure the plant/materials loading/unloading route is clear of all hazards, obstructions, restrictions, etc. if the operations commence. • All suppliers have been asked to adhere to industry guidance regarding work at height on their vehicles. A solution for each load will have been determined before it is dispatched. Loads that cannot be safely unloaded will be turned away. • Depending on banding or shrink wrapping, loads must be strapped to include each row and twice perpendicular to the straps on each row. Note: no individual must enter the bed of a lorry without edge protection.

12.0	Method of work Keeping the workforce and the public safe during street works. 278 Works, Bellmouth, Footpath Construction, Tobermore wall	**Keeping the workforce and the public safe during work on the Highway.** • The Kent Council must issue a Street Works permit before any signage goes up or work starts on the highways. • Residents affected by our work must be notified two weeks in advance. • A permit to "Work in the Public Domain" must be completed by the team in Persimmon Homes in the site office. • The utilities drawing will always be available to the team in the work area so they can refer to it. • CAT and Genny will be used to scan the area, and any service detected will be marked with spray paint. • There will be trial holes done to find out the exact location and layout of the services at least in three different locations. • Three way and four ways traffic lights will be in place during those works • Every work must take place within the traffic management area. • TM will be a lane closure, and traffic lights will manage it. Three/four-way traffic lights are the main TM for most of the works on the Goudhurst Road. • The work area will be demarcated using Chapter 8 barriers clipped on each other or zip-tied and weighted down with a sandbag. • Pedestrians will be diverted to the other side of the road, and appropriate signage will be erected to show that. • Excavations will be secured with Heras fencing and double clipped. • Any uprising and materials will be kept at the main site. No materials will be left overnight in the area. • The site supervisor must liaise with the property owner and notify them in advance of any disruption. We will cooperate with them to keep disruption to a minimum. Access to their properties will be maintained at all times. We will aim to backfill any open trench in front of any property entrance before we leave the site. • Access for emergency services will be maintained at all times. • Overhead powerlines in certain work areas on the road: Only restricted plant to be used at those locations. Relevant signage to be in place. • HV services in the proximity of works. Archban overalls must be used during those works. Air pick, Vacex and insulated tools. No mechanical digging. • Only trained operatives to carry such works. **Bellmouth Formation** • Mark the area to be excavated as per bellmouth design – refer to drawings: 3902-1050-RV P13 • The excavated material will be removed directly in tipper trucks to avoid double handling and stored on site. If the material is suitable for reuse, stockpiles will be required – All stockpiles must be managed to allow safe access for dumpers with shallow gradient ramps and bunded sides. • Excavate the road to formation level using traveler and profile boards, as set out by the site engineer. If possible, excavations should be dug from reduced levels and backfilled on the same day, thus avoiding any risks that open excavations would incur. • Offer formation to the client for approval: HOLD POINT • One person will inspect the formation to confirm uniformity and compliance with the specifications. • Lay Formation subject to CBR-s. • **Refer to drawings for material type and depth of each layer** • Subbase type • Base layer • Binder course • Surface course

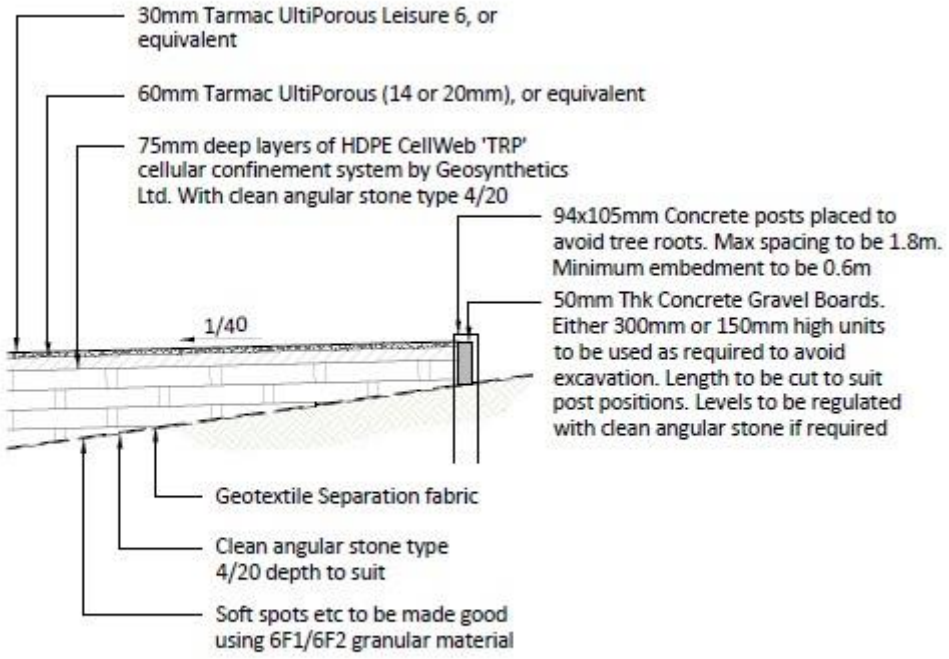


Preparation:

- Complete the appropriate Houlihan Site Procedure, "When Requested To Work On Near Live Services", paperwork.
- Make sure the operatives have received Houlihan's "Digging on/or round live services" and they have signed to the Designated RAMS for this procedure.
- The site and dig team supervisors must have Working around services training and hold NRSWA .
- The team must receive the briefing for the task before the start of the work.
- Complete an appropriate Risk Assessment safety check.
- Wear the appropriate Arc Flash Protective Suit that has been issued, as well as the protective face shield and gauntlets. Specifications of the protective clothing are available in the Houlihans site office.
- Check the service drawings to determine the number of cables, voltage rating, and physical dimensions of the cable(s). When Houlihan arrived on site, CAT and Genny sweeps of the perimeter boundary must have been carried out. Any services identified, tracked, traced, and marked with service indicators must have been recorded in the existing services drawing.
- Use a cable avoidance tool (C.A.T. & Transmitter) to trace the cables' line and mark their route on the ground. The supervisor or Engineer must carry out this task only. The EZiCAT i750, with depth locator, memory, GPS, and Bluetooth, will be used at minimum.
- Complete the appropriate permit to dig, ensuring the service drawings are issued. Take a copy of the permit and armband issued by Houlihans as PC with you to the dig area.
- Goal posts near any overhead powerlines/BT, Relevant signage, Plant with height restricter..
- Works will take place under lane closure.
- Construction of the footpath will follow the drainage completion of the drainage section.
- The drainage trench will be backfilled to where the footpath construction level starts.

Footpath Construction.

- Mark the area to be excavated as per footpath details on the S278 drawings including -3902-1050-RV P13
- The excavated material will be removed directly into the dumper to avoid double handling and stored on site. If the material is suitable for reuse, stockpiles will be required. All stockpiles must be managed to allow safe access for dumpers with shallow gradient ramps and bunded sides.
- Excavate the road to formation level using traveler and profile boards, as set out by the site engineer. If possible, excavations should be dug from reduced levels and backfilled on the same day, thus avoiding any risks that open excavations would incur.
- Compact the formation level.
- Offer formation to the client for approval: HOLD POINT
- One person will inspect the formation to confirm uniformity and compliance with the specifications.
- Lay a Terram / geotextile to extend below the kerb and edging location.
- Lay Formation subject to CBR-s.



Typical Section through No-Dig Footway
(Scale 1:25)

Kerb / Edging Installation HB2 or BN

- New kerb and edging lines will be set out using non-penetrating cantilevered 'pin-safe' with "top of kerb/ edging" levels marked.
- The excavator will conduct minor excavations to provide suitable depth for kerb /edging and concrete bedding.

:

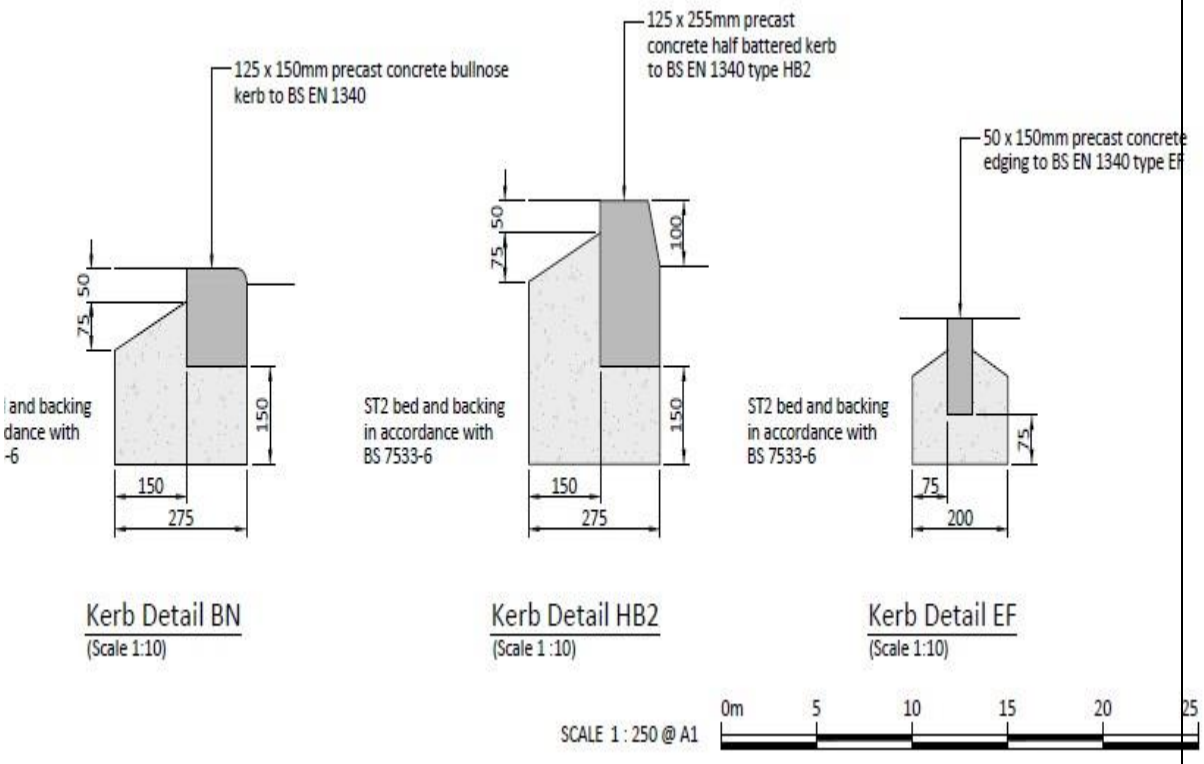
Option 1 - Sacrificial full-height kerbs to retain the edge of the roads.

- Kerbs will be loaded out by the tracked excavator using lifting strops or, alternatively, forklift attachment, and each stack will be deposited at a suitable position along the kerb line.
- Kerbs will then be installed or deposited from the pallet using the Probst kerb laying dolly, as close to the proposed kerb line as possible.
- The concrete will be distributed by the excavator bucket to the line.
- Concrete will be manually levelled under the string lines and will be left approx. 20mm high to allow for bedding of the kerb.
- For Kerbs that aren't able to be finally placed by the Probst kerb dolly, two skilled groundworkers will use the 'bicycle handle type' kerb

lifter and finally lift them into their proposed position

Note: Under no circumstance should anybody use the 'bicycle type' handle lifter as their primary laying process; it should only be used where the Probst kerb dolly is limited in use. Once kerbs have been placed on the concrete bed and aligned/levelled, they will be levelled using a pick.

Note: Edgings will be installed in a similar method to the installation of concrete 7N blocks.



Option 2 – 7N concrete blocks used as templates.

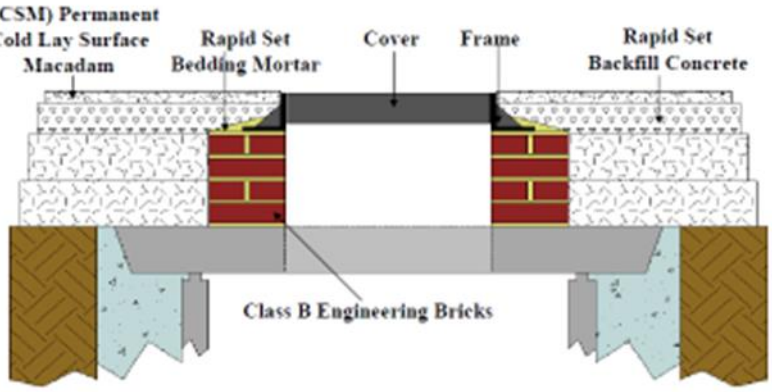
- Blocks will be loaded out by the tracked excavator using lifting strops or, alternatively, forklift attachment and will deposit each stack at a suitable position along the kerb line.
- The concrete will be distributed by the excavator bucket to the line.
- Concrete will be manually levelled under the string lines and will be left approx. 20mm high to allow for bedding of the kerb.
- Blocks will then be manually placed in accordance with the engineer's pins and string line.
- Bedding and hunching concrete will be delivered to the site ready mixed and will be deposited in a stockpile.
- Following kerb/ block installation, all iron works will need to be raised to base course level to avoid subsequent damage or residual trip hazards.
- Carry out final preparation to sub-base using the excavator and Bomag roller.
- Base course tarmac will either be installed by us or a specialist contractor, depending on road features and quantity. The base course tarmac if installed by us will typically be levelled off by a 360 excavator and rolled in accordance with the relevant specification.

Note: Edgings will be installed in a similar method to the installation of concrete 7N blocks.

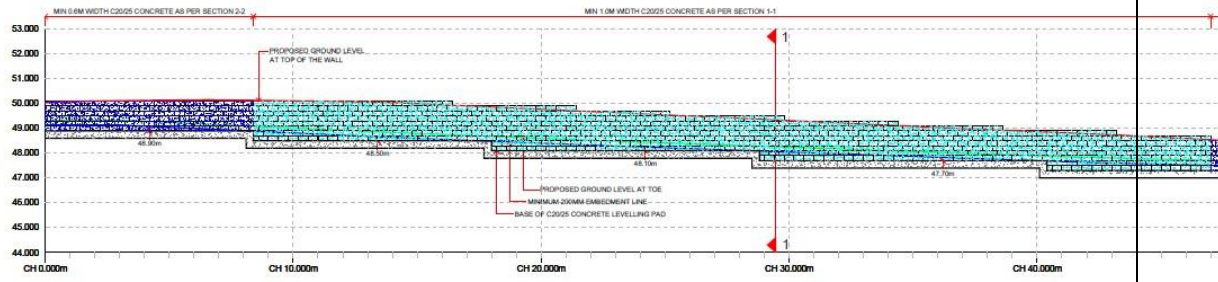
Raise Ironworks.

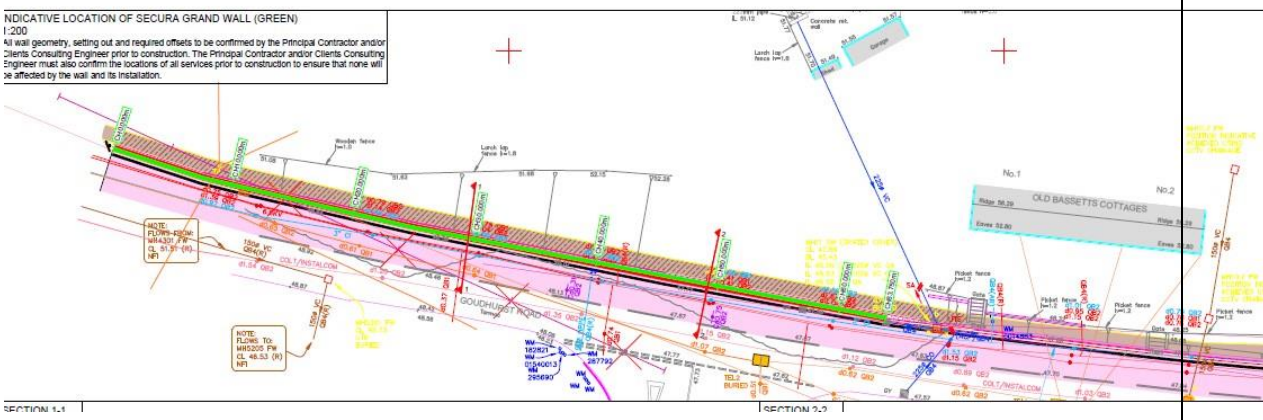
Enclose the work area with half-height barriers. Ch 8 signage will be used to direct other on-site trades away from the area of work and the access and egress routes to it.

Using a Petrol Saw with a water-suppression pressurised pump, the retaining material will be scored, broken, and transported to a stockpile for reuse or removal.
The engineer will give the finished road level and camber, operatives will lay the ironworks to these levels.
Engineering brick will be laid on a bed of mortar, with a minimum of 2 courses and no more than 4 courses.
The cover will be laid to line and level and surrounded by concrete to the underside of the tarmac level. The concrete will be allowed to cure, and tarmac will be called to the site, laid, levelled and compacted.



Tobermore Wall





Blocks : Secura Grand

CONCRETE BACKFILL SECTION
FOUNDATION FOR WALLS:
Phase I Desk Study, Site Reconnaissance & Phase II Site Investigation Report - Bassetts Farm, Horsmonden LE/QMS/Doc 7/5-I Issue 4 (April 2015) does not cover the location of the propsoed wall, we have based our information on the boreholes located closest to the proposed wall, WS02 & WS03. If the ground conditions appear to be more onerouse that the assumed, this design will not be valid and need reviewed. We have therefore

assumed that competent stratum with a safe bearing resistance in excess of 80kPa is present at the proposed wall formation level. Ground conditions and the safe bearing resistance must be confirmed by the Principal Contractor/Geotechnical Engineer prior to construction by intrusive investigation and testing.

To achieve a suitable foundation for the block wall, excavation must be taken place down to a competent horizon assumed to be competent medium-dense sandy SILT or firm to stiff silty CLAY based on the BSI GeoIndex with a safe bearing resistance of 80kPa. Competent bearing stratum should be confirmed by the Principal Contractor via testing prior to construction. Any local soft/loose or unsuitable areas in the foundation soil shall be excavated out to a suitable strata and replaced with compacted granular fill. We advise several trail holes are excavated along the line of the proposed wall prior to construction to confirm the ground conditions.

Details of the proposed pedestrian protection to the top of the wall must be confirmed by the Principal Contractor/Client's Consulting Engineer prior to construction. We have assumed a maximum 1.8m high fence (designed and detailed by others) will be installed behind the wall. The posts should be fully concreted into minimum 1.0m long, 0.3m Ø sleeves, preinstalled into the backfill during construction. Geogrid tails to be locally cut to accommodate sleeves.

If a higher screen fence is to be installed behind the wall, larger post foundations will be required. Pedestrian barrier to comply with CD 377. It is assumed that all wind/impact loads are to be accomodated by barrier base, with none to be transferred to the Secura Grand Wall. This is outside the scope of this design and is to be designed by others.

Any vehicle barriers should be designed by others, with the appropriate clear working with to the rear. It is assumed that any vehicle barriers will be designed by others to accommodate any impact loads, in accordance with BS8006-1:2010, Annex E. No impact loads have been assumed to be transferred to the wall, based on the presumption that the barrier is to provide a normal/higher level of containment. Barrier requirements at the crest of the wall to be determined by the Principal Designer.

SURCHARGE

A maximum live load of 5kN/m² was assumed to act on the retained side of the wall. Please advise us if the surcharge on the retained side of the walls in the permanent condition is to exceed 5kN/m² -the Client's Consulting Engineer must inform Geoman Ltd. if a more onerous surcharge should be considered prior to construction as this design must be reviewed.

TEMPORARY STABILITY

This retaining wall solution is for the permanent works only, and is issued on the basis that a safe system of works is provided for construction. The Principal Contractor must produce a method statement and risk assessment for the works to be approved by the Principal Designer. Temporary excavations can fail rapidly and without warning. Temporary stability and design of any temporary works is outside our scope and should be confirmed by a Temporary Works Designer appointed by the Principal Contractor.

HEAVY CONSTRUCTION TRAFFIC OPERATING CLOSE TO THE WALLS:

It should be ensured that the face batter is not compromised by the use of heavy compaction plant machinery too close to the front of the walls. If construction plant is to traffic the crest of the walls, a suitable haul road design must be undertaken and be set back an adequate distance from the rear of the walls (designer by others). If construction plant operates on the unprotected retained material, distortion/bulging of the walls may occur.

SERVICEABILITY MOVEMENT OF THE WALL AFFECTING ROADS, SERVICES OR STRUCTURES AT THE CREST OF THE WALL

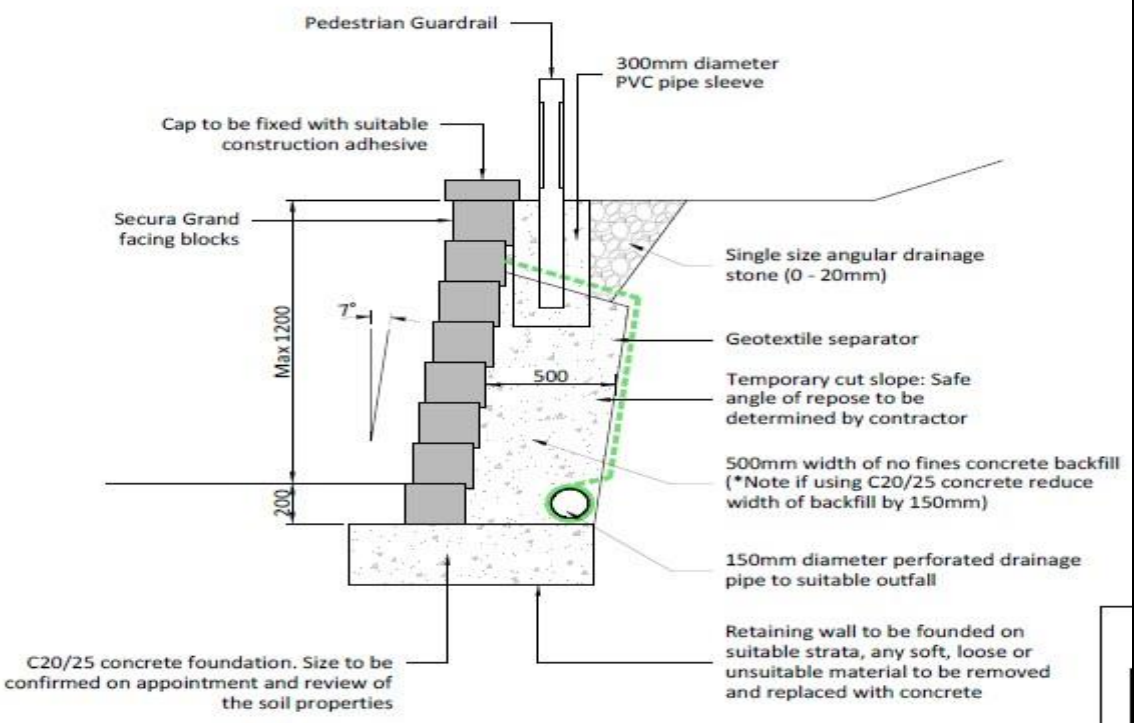
Reinforced earth retaining wall are flexible, and some settlement will occur during and after construction. Some settlement of the subgrade will occur after construction, depending on the compaction of the foundation soils and backfill. The settlement should be monitored, and all finishes should be delayed until settlement is complete.

Site Preparation

- Mark out the wall line using spray paint or string line.
- Excavate trench to required depth (usually 300–500mm below finished ground level depending on wall height and ground conditions). Refer to drawings for details
- Ensure trench is level and to design dimensions.

Base Construction

- C20/25concrete foundation – refer to drawings for details
- Check levels with laser level**.**
- Lay the first course of blocks directly on the prepared base.
- Ensure each block is level front to back and side to side.
- This course is the most critical for alignment and level.
- Install 150mm diameter perforated pipe behind the wall, wrapped in geotextile, leading to a suitable outfall.
- Continue building wall courses, staggering vertical joints ("running bond").
- Backfill with clean stone and compact behind each course.
- Install geogrid reinforcement (if required by design) at specified heights and extend back to the design length.
- Use geotextile fabric where needed to separate soil and stone layers.



NOTES:

- All cross sections assume a soil friction angle of 30 degrees.
- All references are to the latest British Standard and European Standards.
- For installation refer to Tobermores installation guide. www.tobermore.co.uk

Typical Tobermore Secura Grand Retaining Wall
(Max 1.2m Retained Height)
(Scale 1:25)

13.0	Method of work Drainage	**Setting out / Earthwork preparation & installing proprietary support systems:** All excavation works will be carried out in accordance with the Construction (Design and Management) Regulations 2015, the Guidance contained in Health and Safety in Excavations HS(G) 185 "Be Safe and Shore," and the CIRIA Guide to Trenching Practice. Before any excavation, a Permit to Dig must be raised, an existing utility drawing must be on-site, and the excavation area must be scanned using Cat & Genny. • Set out the extent of the run/s, ideally commencing from the terminal connection or lowest point. • The work will start installing the ASW 23. • Identify and supply appropriate earthwork support, such as proprietary trench and manhole boxes. Note: support systems must be set up in accordance with the installation guidance provided by the preferred supplier. However, due to the depth of the drainage (depth of the drainage varies between 1400mm and 3982mm(Manhole AFW35)), trench box/manhole boxes must be used. • A manhole box will be used as excavation support while manholes are installed. • A trench box must protect the extent of the proposed drainage run. • Conduct existing survey investigations, including marking any potential services in close proximity with CATs on the ground and excavating trial holes to ascertain actual line and depth.

- Identify access, movement and storage areas and erect safety exclusion fencing to enclose the works.
- The perimeter of the proprietary earthwork support systems should be sprayed on the ground of the proposed dig so that the excavator operator can cut the trench/ excavation tightly and ultimately prevent voids around the in-situ boxes.
- An operative trained on the abrasive wheel and face fit tested will use a floor saw to cut the existing tarmac.
- A floor saw will be used together with water dust suppression, and the operative will be using the required PPE for this operation, which includes: ear defenders, impact goggles, and an FFP3 face mask.
- A pneumatic breaker mounted on the 360° excavator will then be used to break the tarmac. The removed tarmac will be removed and stockpiled separately on site for later disposal as Haz Waste.
- Commence excavation, initially to a suitable depth to allow installation of the trench box, typically 1.00m below ground level (bgl).

Please note that in unstable conditions, the box would be installed at a higher level and adjusted as the excavation proceeds.

- In excavations 2.4m and below it will be necessary to use an additional base or top box section or to terrace the top of the excavation – ensure handrails and ladder access platform is installed.
- Remove all excavated material from the excavation area to prevent imposing an unnecessary load onto the excavation face. The material should be kept a minimum of the excavation depth away and immediately used for backfilling as soon as the earthwork support system has been extracted.
- Installation of the box by hooking a suitable set of 4-leg chains to the specified lifting eyes attached to the designated lifting eye on the 360° excavator's quick hitch.
  - Continue excavation within the confines of the box to the intended level.
  - Where there is doubt, provide gas testing/monitoring equipment and fix it at an appropriate position in the excavation to provide sureness.
  - Install the dedicated access platform to the trench/manhole box and fix the ladder and guard rails prior to entering the trench/ manhole box.
  - Place clean, washed shingle/concrete bedding using the excavator bucket. Materials will generally be discharged into a drag skip or alternatively in the skip of a dumper.
  - During the placement of any material/product into trenches, all operatives must evacuate the excavation.
  - Dumpers must not directly tip into the trench.

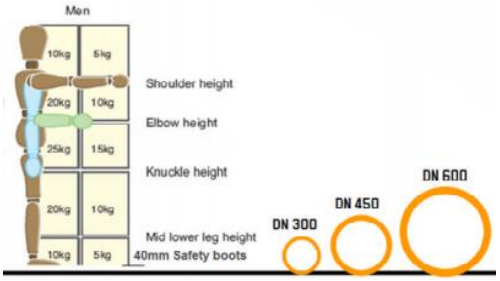
Recommended excavator bucket selection (mm) versus pipe diameter (Ømm):

150Ømm – 450mm / 225Ømm – 600mm / 300Ømm – 600mm / 375Ømm – 750mm / 450Ømm – 750mm / 525Ømm – 750mm / 600Ømm – 900mm / 675Ømm – 900mm / 750Ømm – 900mm / 900Ømm – 1200mm or 1350mm / 1050Ømm - 1200mm or 1350mm / 1200Ømm – 1500mm or 1800mm / 1500Ømm – 2100mm

Pipe laying (clay): Nominally foul sewers

Clay pipe weights: Suitable to manually lift / Unsuitable to manually lift

100Ø x 1.6m (L) weigh 15kgs / 150Ø x 1.00m (L) weigh 18.5 kg / 150Ø x 1.75m (L) weigh 31 kg / 225Ø x 1.75m (L) weigh 61 kg.



- Pipe laying will commence and should (but not always necessary) start at the downstream end. The pipes are usually laid with the sockets upstream. The installation of Attenuation Tanks could be done first as the starting point for each section of the surface water.
- Operatives can manually place pipes of 150Ø or below, depending on the excavation depth; pipes can be passed down or lowered manually, utilising a web sling. As appropriate, pipes will be aligned using a string line or pipe laser.
- Ensure that the inside of the coupling and the exterior of the spigot are clean.
- Spread a layer of lubricant over the pipe end to the required insertion depth and push the coupling home onto the pipe.
- The pipes shall be laid true to the line and level within tolerances specified by the design. Any necessary adjustments to the level shall be made by raising or lowering the bedding, always ensuring that the pipes are finally provided with support along their whole length. Adjustments to level and position shall not be made by local packing.
- Lower the next pipe into the trench, inserting the pipe into the coupling of the pipe previously laid.
- All pipe laterals must be capped with suitable plugs or caps—not scrunched-up bags, packaging, etc.
- Each run or section will be tested before and after backfilling this will be carried out in accordance with the recommendations set out in BS EN 1610:2015.
- The larger pipes 225Ø+ will be placed by the excavator, pre-slung with 2x choked web slings by a slinger/signaller and lowered into position in the excavation. Note – there must be no operative within the proprietary earthwork support system whilst any load is being slung overhead – especially clay pipes, due to the vulnerability of them shattering, producing razor-sharp fragments.

Pipe cutting (Clay):

- Pipe chain cutter for 100Ø & 150Ø pipes - Cutting shall be performed with the correct tools, and as recommended by the pipe manufacturer, cuts shall ensure adequate performance of the ensuing joint.

*This procedure should be followed to ensure a good quality cut with a Lever action pipe chain cutter (100mm Ø & 150mm Ø clay pipes **MUST** be cut*

with a pipe chain cutter as follows):

- Make a clear mark around the circumference of the pipe at the desired length.
- Pass the chain under the pipe, aligning the cutting wheels on the desired mark.
- Hook the chain link onto the jaw of the pipe cutter.
- Tighten the chain upon the pipe by closing the arms of the lever cutter together.
- Make a final check for correct alignment of the chains with the pipe, then continue to increase the chain tension until the pipe cuts.
- After cutting, any sharp edges may require trimming with an emery stone. For both 100mm and 150mm diameter use pipe trimmer.

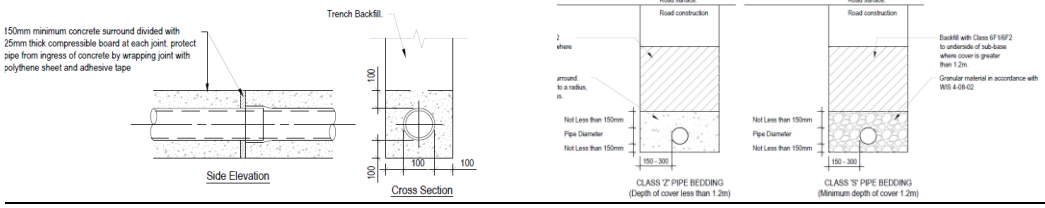
Powered Masonry Saw:

- A powered masonry saw can be used to cut any diameter of pipe we use. Generally, 100Ø & 150Ø diameter pipes are cut with a pipe chain cutter for speed and efficiency.
- 225Ømm pipes are generally cut by a powered masonry saw using a diamond-tipped blade.
- When using a powered masonry saw, follow a safe system of work: Note that only appointed and authorised individuals should use an abrasive wheel.
- Before any pipe-cutting operation starts, read and adhere to the safety and operating instructions of the masonry saw and the blade manufacturer.
- Check that the masonry saw is fitted with the correct specification of the blade.
- Make a clear mark around the circumference of the pipe at the desired length.
- The pipe being cut should be positioned horizontally and stable.
- Care should be taken to support and secure both halves of the pipe being created by the cut to avoid the blade being nipped as the pipe separates.
- With the correct personal protective equipment in place commence the cut; the best quality cut is generally achieved by making one continuous cut.
- After cutting, any sharp edges may require trimming with an emery stone.

Note- Short-length pipes should be ordered directly from the preferred supplier to minimise cutting operations on site.

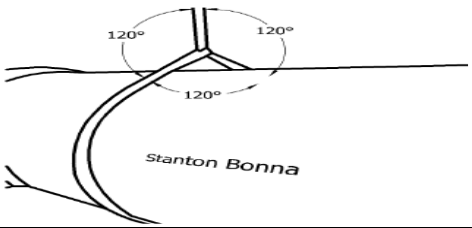
Backfilling:

- Withdraw earthwork support when backfill reaches the underside of waling.
- In the first stages of backfill, selected material should be placed uniformly on both sides of the pipe by hand in layers not exceeding 100mm in thickness, each layer being compacted by hand tamping until the pipe has a minimum of 150mm compacted cover.
- Further backfill should be placed in layers not exceeding 300mm, each layer being well compacted. Mechanical compaction equipment should not be used until there is a minimum of 450mm of compacted material above the crown of the pipe.
- Note that shallow-depth drainpipes must be encased in Gen3 concrete. Pipes under driveways will be surrounded by concrete at least 100 mm thick, while under highways, the concrete surrounding the pipes will be 150mm -300mm thick.
- To protect the pipe joint from the ingress of concrete, the joint will be wrapped with a polythene sheet and adhesive tape. Joints will also be divided with a 25mm compressible board from the surrounding concrete.
- Backfill with Class 6F1/6F2 will be used under the sub-base where the cover is greater than 1.2m.



Alternatively, if a pipe lifter cannot be used due to size or weight

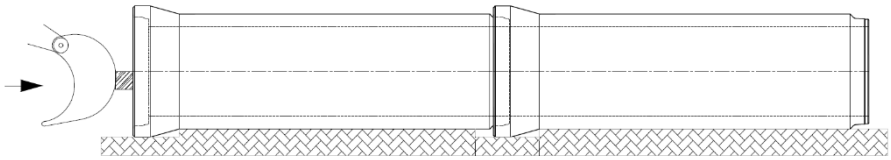
- Jointing chains or appropriate straps can be used to carefully lift and guide pipe spigots into the previously laid pipe sockets, taking care not to disturb the jointing ring or damage the jointing surfaces.
- The spigot should be offered up to and centred carefully into the receiving socket.
- The pipe can now be allowed to rest on the bedding material (alternatively, the pipeline can be back-laid, i.e., new pipes laid with the socket offered up to previously laid pipes spigot—special attention should be made to ensuring the socket does not scoop up bedding material and hence contaminate the joint when laid using this method).
- The sling must be wrapped around the barrel of the pipe in a choke at the balance point. Position the bight for the choke lift at 120°(natural angle) – as per the sketch below:



Using the excavator bucket or pulling the pipe home with a strap/jointing chains, which are common methods of completing the joint. If using the excavator bucket to push the pipe home, always place a timber between the back of the bucket and the pipe socket (spigot if back-laying). Apply a steady, even pressure until the pipe is in its final joint position, with the joint gap being within the recommended limits of between 10-25mm (joint gap measured internally).

ENSURE NO OPERATIVES ARE WITHIN THE TRENCH WHILST THE BUCKET IS APPLYING PRESSURE AGAINST THE TIMER PUSHING THE PIPE INCASE THE TIMBER BREAKS AND STRIKES AN OPERATIVE IN CLOSE PROXIMITY – NOTE THIS HAS HAPPENED WITHIN THE INDUSTRY BEFORE AND RESULTED IN A FATALITY.

As shown below: (Jointing with the excavator bucket).



Note: The mechanical plant must not be used to press pipes down to their correct level.

Groundwater should be kept below the bottom of the trench by using temporary drains and not allowed to rise before backfilling is complete.

All pipelines, especially those for foul sewers, are tested after each independent pipe is laid and prior to backfill.

Manhole installation:

Recommended excavation size/manhole box to suit manhole Ø mm:

Manhole Ø	Square Manhole box dimensions	Comments
1050Ømm, 1200Ømm, 1350Ømm	2.5m(L) x 2.5m(W)	1350Ømm (tight)
13500Ømm, 1500Ømm, 1800Ømm	3.0m(L) x 3.0m(W)	1800Ømm (tight
1800Ømm, 2100Ømm	3.5m(L) x 3.5m(W)	2100Ømm (tight)
2100Ømm, 2400Ømm, 2700Ømm	4.0m(L) x 4.0m(W)	2700Ømm (tight)
2700Ømm, 3000Ømm	4.7m(L) x 4.7m(W	None
3000Ømm, 3660Ømm	5.0m(L) x 5.0m(W)	None

Manhole excavations will be conducted/supported similarly to the previously mentioned drain runs and will have PCC chamber sections placed by the attendant excavator.

- Again, operatives will leave the excavation until the PCC chamber ring is stable and near the intended position.
- The section will then be manually guided into the final position on the concrete/shingle bed or previous section.

Note – the second and subsequent PCC rings must not be installed until all benching has been undertaken.

- Once the benching has been undertaken with the additional sections installed and the manhole is a traditional type (not pre-formed), a concrete manhole surround steel shutter will be lifted into place, along with the surround safe handrails.
- Once the concrete has cured, the shutter will be removed, and the cover slab will be lifted into position; there are usually lifting anchors on the face, allowing the use of hook and chain.

Backfilling:

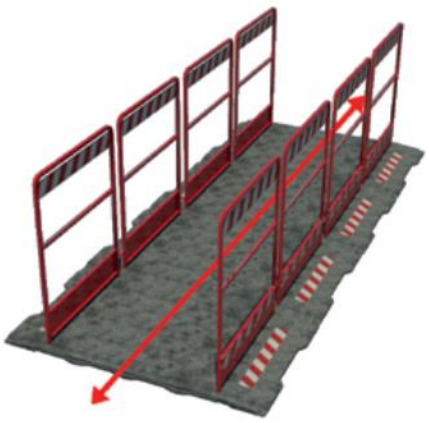
- Withdraw earthwork support when backfill reaches the underside of waling.
- In the first stages of backfill, selected material should be placed uniformly on both sides of the pipe by hand in layers not exceeding 100mm in thickness, each layer being compacted by hand tamping until the pipe has a minimum of 150mm compacted cover.
- Further backfill should be placed in layers not exceeding 300mm, each layer being well compacted. Mechanical compaction equipment should not be used until there is a minimum of 450mm of compacted material above the crown of the pipe.

Producing as-built drawings & testing:

On completion, the run will be marked on the as-built record drawing together with dates of test & inspections.

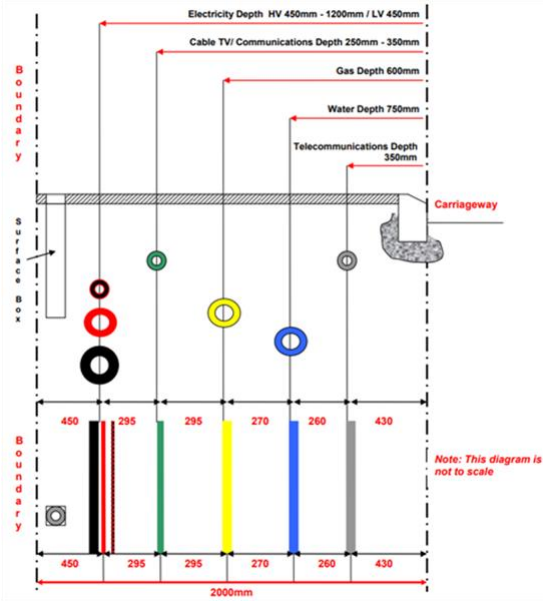
Emergency Plan:

- If there is an emergency at the bottom of an excavation, then initial assessment by first aiders will establish if the IP can be moved or must be stabilised in situ pending the arrival of paramedics.
- Until and unless agreed first treatment can be carried out in situ, preparation for paramedic access and subsequent evacuation by stretcher will immediately begin.
- In the event of evacuation being necessary, this will be achieved down to 5.0m. BGL by the excavator pulling a ramp in the direction of the run being pulled to an angle of approximately 20°. The sides of this ramp will then be reduced to allow safe access and egress by paramedics.
- If the ramp cannot be pulled in the direction of the run, the excavator will move around to the opposite end of the boxes, where the pipework has already been installed, and a ramp will be constructed in the opposite direction to the run.
- Below 4.5.0m. A davit arm will be provided and attached to the box side. A rescue stretcher will be available at ground level for deployment as necessary. We will always try to bring the paramedics to the casualty, not evacuate the casualty unless there is danger compromising their staying in situ with first aiders stabilising the situation. The ramp for entry and egress with the casualty is far safer, and we will be using it as the first choice down to 5.0m. This stems from the actual experience of bringing up an injured person from the bottom of a trench at great risk to him and the rescuers.

14.0	Method of work Installing Services	**Preparation** Before any work is carried out, the following items must have been completed, and copies of relevant documents must be available at the site of the works: • Accurate plans showing all existing services near the work site. • Plan of proposed new services trench. • Correct signing & guarding implemented as per TMP. The actual width of the trench depends on the following factors: - Type and size of services being laid. - Number of services being laid in the same trench. - If low—and high-voltage cables are laid in the same trench, the effect on the cable ratings must be considered. - Whether ducts are being used. - If mechanical means are being used to excavate the trench to install a single cable, then the width can be as narrow as 150mm. - The trench width must also allow for mechanical compaction. Trenches should: - - Be as straight as possible. Where bends are unavoidable, the trench should allow the service to be installed at not less than its minimum bending radius. - It should be to the approved dimensions and normally have vertical sides, which should have a side support system (e.g. timbering) if the ground is soft or loose. - Have a firm and smooth contoured base. - The trench shall be cleared of water by pumping to prevent the risk of collapsing and hazard to the general public, especially trespassing children. In locations where flooding can occur, measures shall be taken to divert rainwater away from the trench (e.g., use of sandbags). - Have provisions made during their excavation to cater for access of persons and vehicles to property of places alongside the route. - In concrete surfaces, be cut through the concrete as per the HAUC *Specification for the Reinstatement of Openings in Highways.* *When machines are being used for excavation, and the location of the other plant is known, the plant should be uncovered by hand excavation to reduce the possibility of damage. If the excavation is likely to reduce the stability of any part of any structure, work shall not be commenced unless adequate precautions are taken to prevent the structure from collapse or deterioration. Flooding or vibration from heavy traffic can cause a collapse of trench sides and the subsidence of adjacent structures. A trench-side support system or shoring shall be used to avoid this.* Where service trenches are to be left open at any time, MGF Walksafe or a similar device will be installed and maintained to provide safe access to plots.  When machines are being used for excavation, and the location of the other plant is known, the plant should be uncovered by hand excavation to reduce the possibility of damage. If the excavation is likely to reduce the stability of any part of any structure, work shall not be commenced unless adequate precautions are taken to prevent the structure from collapsing or deteriorating. Flooding or vibration from heavy traffic can cause a collapse of trench sides and the subsidence of adjacent structures. A trench-side support system or shoring shall be used to avoid this. **Excavating service trench** **Excavation** All excavation works will be carried out in accordance with the Construction (Design and Management) Regulations 2015, the Guidance contained in

Health and Safety in Excavations HS(G) 185 "Be Safe and Shore," and the CIRIA Guide to Trenching Practice.
Before excavation, a Permit to Dig must be raised, an existing utility drawing must be on site, and the excavation area must be scanned using Cat & Genny.

- Each drainage run opened at any one time will not exceed 50m. Where practicable, we will backfill excavations overnight. In the event that excavations are left open, they will be physically barriered off. The foreman will check the face of the excavation before the start of the shift. Any excavation will be checked after events such as heavy rain that might affect its stability. The checks will follow Houlihan & Co.'s checklist. All inspections will be recorded in the Houlihan Record book.



- Apparatus must be installed below the carriageway construction layers unless special arrangements have been made with the relevant authorities. Where the plant can only be laid in the road, adequate protection should be provided. Ducts will be laid to specifications, sanded, and warning tape placed over them.
- Pre-tender information and the Construction Phase Plan will be used and considered in light of additional information from utilities' plan drawings, section drawings from utility companies recording the depth of services, and commissioned ground probing radar surveys as necessary.
- The assumption that live working can be avoided as the default position is set out above, and a full justification of any live working must be set out before this is considered. A method statement for live working will be required as live working is not considered to be properly controlled by any permit-to-work system. HSG47 states, "Where new services such as electrical or gas supplies are being installed, it may be possible to reduce risks by not installing or commissioning them until other groundworks and work on the installation have been completed. This should be considered early in the design process to allow the works to be sequenced accordingly."
- A cable avoidance tool in conjunction with a transmitter will be used by a competent person prior to the commencement and during any work to identify all services capable of being identified. The intention will be to bring up to date records of existing services and to supplement these records where they are deficient. Services found will be clearly identified to avoid the risk of damage, and where necessary, we will hand dig around them to expose the services prior to full excavation. Hand digging will require the use of air picks to expose services, starting immediately under the hardcover. Record drawings will be red-lined to show the most up-to-date information, held available on site for consultation and details communicated at inductions, toolbox talks and in careful briefing on site prior to excavation.
- If any service is exposed, it will be photographed and sketched with offset notes to inform future re-visits.
- The backfill will be with self-compacting granular material to a level where compaction is acceptable and then in a suitable material, including selected as dug, which must be possible to excavate with the air pick in the future: i.e., dense, cohesive material like clay must NOT be used. If suitable backfill material is unavailable, the excavation should not proceed.
- Warning tape will always be placed, and if the utility has not provided it, we will have rolls to use. In addition to using marker tape provided for each service, another physical barrier will be placed on top of the sand. As agreed by management, half a width of the red debris net will be placed first before the backfill. If the physical protection specified is not in place, then the backfill will not be completed until the protection is in place.
- Great care will be taken to establish what is meant by "terminations" or "diversions", and any assertion that there are "no" services will be treated with caution.
- Techniques using ground penetrating radar will be considered where information is clearly deficient and services are congested.
- We will comply with the Permit to Dig system.
- Traffic management will set up traffic control in stages throughout the entire route to keep disruption to a minimum.
- The operatives will barrier the work area at all times to keep the general public safe.
- The trench to be excavated will be cat and genny to mark up all existing services, and all appropriate drawings will be read. If in any doubt, a trial hole will be hand excavated to confirm any existing services.

- The trench will be marked out in the footpath or verge so the tarmac or turf can be removed so the service trench can be excavated to allow the installation of the service main. All arising is to be removed from the site by use of a forward tipping dumper for reuse or removal from the site at a later date, as per the SWMP.
- Water mains, gas mains and LV electricity cables will be laid by others, into the trench at the correct depth and surrounded with sand or a similar bedding material. Warning tape will be installed and pegged. We will then fill the remainder of the trench with 6F2 or similar and compact it layers to the underside of the new tarmac reinstatement.
- The trench will be reinstated to the HAUC spec. Once the services are laid, installation records will be taken, and the GPS positions of the services will be noted on the site drawing for the as-installed records.
- On completion of the works, the traffic management and site equipment will be removed, and the area will have any surplice materials and rubbish removed.

Install services crossovers (Proposed)

- Services positions are per combined services drawing and need to be considered when placing the carriageway. All ducting under the carriageway must be to UKPN standards of 125mm.

- 125ømm and 150ømm Ridgiduct Power HV class 1 ducts fully comply with the electrical supply industry specification for cable protection, ENATS 12-24.

Excavating Round Live Services.

- Accidents may occur if care and attention are not exercised when excavating to locate underground cables. Hand-held power tools and mechanical excavators are the main causes of accidents, so they shall not be used in close proximity to underground cables, specifically 500mm. The first option to excavate around live services will be the VacEx. When unable to use the VacEx for reasons, restricted access or ground conditions, an air-pick will be the next choice.

Before Starting work.

- Complete the appropriate Houlihan Site Procedure, "When Requested To Work On Near Live Services", paperwork.
- Make sure the operatives have received Houlihan's "Digging on/or round live services" and they have signed to the Designated RAMS for this procedure.
- The site supervisor must appoint a competent "Dig Supervisor" to supervise the dig team. The dig supervisor must never leave the dig area. If he is not present, the operation must stop.
- The site and dig team supervisors must have Working around services training and hold NRSWA .
- The team must receive the briefing for the task before the start of the work.
- Complete an appropriate Risk Assessment safety check.
- Wear the appropriate Arc Flash Protective Suit that has been issued, as well as the protective face shield and gauntlets. Specifications of the protective clothing are available in the Houlihans site office.
- Check the service drawings to determine the number of cables, voltage rating, and physical dimensions of the cable(s). When Houlihan arrived on site, CAT and Genny sweeps of the perimeter boundary must have been carried out. Any services identified, tracked, traced, and marked with service indicators must have been recorded in the existing services drawing.
- Use a cable avoidance tool (C.A.T. & Transmitter) to trace the cables' line and mark their route on the ground. The supervisor or Engineer must carry out this task only. The EZiCAT i750, with depth locator, memory, GPS, and Bluetooth, will be used at minimum.
- Complete the appropriate permit to dig, ensuring the service drawings are issued. Take a copy of the permit and armband issued by Houlihans as PC with you to the dig area.

Backfilling:

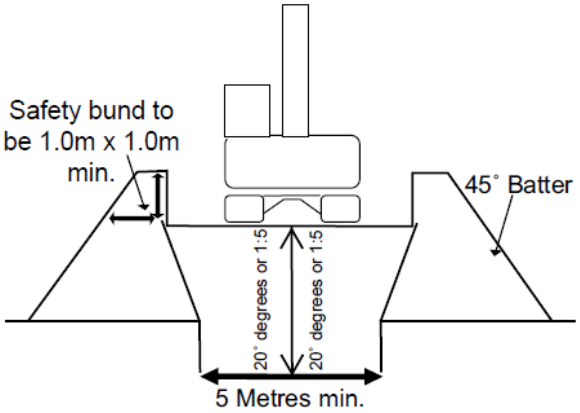
Once the service connections have been made and the utility company indicates that the trench can be backfilled,

- The site manager must take photo (s) of installed services before the trench is backfilled.
- Backfill around cables with a fine material/ building sand, and do not use hardcore as this is likely to cause damage to the protective sheath or

		pipework. • Replace any warning tiles or tape that may have been disturbed. • In the first stages of backfill, selected material should be placed uniformly on both sides of the service by hand in layers not exceeding 100mm thick, each layer being compacted by hand tamping until the pipe has a minimum of 150mm compacted cover. • Further backfill with sand must be done to reach 250-300mm over the top service, then use the marker tape provided by utilities. • Cover the trench width using orange debris netting following Houlihan backfilling procedures. • The other backfilling material should be placed in layers not exceeding 300mm, each well compacted layer. Once the backfill is completed, the Permit to Dig must be closed.

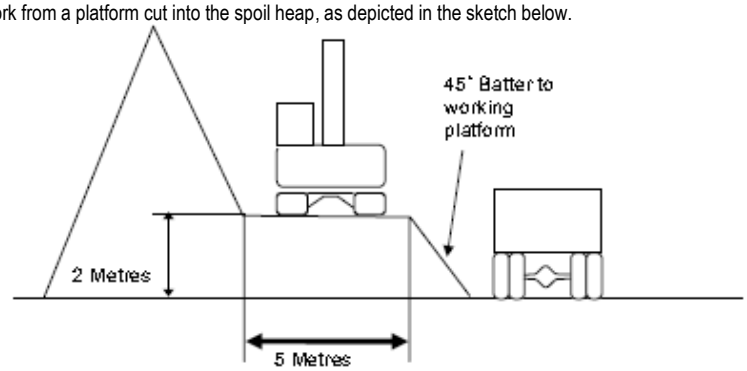
15.0	Method of work Works on/near Underground Services	• Pre-tender information and Construction Phase Plan will be used and considered, considering additional information from utilities' plan drawings, section drawings from utility companies recording depth of services and commissioned ground probing radar surveys as necessary. • Any on-site service disconnections should be confirmed by the Client prior to the com1mencement of construction. • The assumption that live working can be avoided as the default position is set out above, and a full justification of any live working must be set out before this is considered. A method statement for live working will be required as live working is not considered to be properly controlled by any permit-to-work system. HSG47, rev. Feb.2014, states, "Where new services such as electrical or gas supplies are being installed, it may be possible to reduce risks by not installing or commissioning them until other groundworks and work on the installation have been completed. This should be considered early in the design process to allow the works to be sequenced accordingly." • A permit to Dig will be completed prior to excavating on/near underground services, and this will be accompanied by existing and as-built service drawings. • The team working on / near underground services will be trained on "Digging on/ near Underground Services" Houlihan's Procedures, briefed on the task, provided with existing or/and as-built drawings, and will sign the Permit to Dig prior to starting any works. • A cable avoidance tool in conjunction with a transmitter will be used by a competent person prior to the commencement and during any work to identify all services and ducts. The intention will be to bring up to date records of existing services and to supplement these records where they are deficient. Services found will be clearly identified to avoid the risk of damage, and where necessary, we will hand dig around them to expose the services prior to full excavation. Hand digging will require the use of air picks to expose services, starting immediately under the hardcover. Record drawings will be red-lined to show the most up-to-date information, held available on site for consultation and details communicated at inductions, toolbox talks and in a careful briefing on site prior to excavation. • As each service is exposed, it will be photographed and sketched with offset notes to inform future re-visits. • The backfill will be with self-compacting granular material to a level where compaction is acceptable and then in a suitable material, including selected as dug, which must be possible to excavate with the air pick in the future: i.e., dense, cohesive material like clay must NOT be used. If suitable backfill material as described is not available, the excavation should not proceed. • Warning tape will always be placed on top of the sand backfill, and if the utility has not provided it, we will have rolls to use. If physical protection is specified, the backfill will not be completed until the protection is in place. A 1-tonne bag of sand will be placed at each planned service connection. Red debris netting will be placed over the sand backfill as an additional warning. • Great care will be taken to establish what is meant by "terminations" or "diversions" and any assertion that there are "no" services will be treated with caution. • Techniques using ground penetrating radar will be considered where information is clearly deficient and services are congested. • We will comply with the Principal Contractor's Permit to Dig the system. We will additionally follow HSE advice that a permit-to-work system cannot adequately control works on or near live services. We will provide a full method statement for the work and brief our competent team on it.

16.0	Method of work Spoil Heaps	<u>There will be a need to stockpile separately different categories of material whether it eventually goes to landfill or can be recycled or re-used.</u> • Stockpiles will be constructed by the dumper tipping material at ground level for an excavator to place as a graded pile. The excavator is required to grade off the sides to a compacted batter throwing off rainwater and dressing the top likewise. • Dumpers must not tip on uneven ground: all tipping operations must be undertaken on level firm ground. • The sides and end of the spoil heap must be bunded (at least 1.0m(H)1.0m(W)) • The stockpile will be monitored for slippage and damped down if any dust becomes airborne. • The angle of repose will be estimated for different materials, with 45° an accepted average unless there is evidence of slippage. • Stockpiles of topsoil will be no higher than 2.0m as this would prevent aerobic action in the heap and render the topsoil sterile. • Notify the H&S department to arrange an inspection within 24 hours of the former spoil heap. • We will include spoil heaps in our temporary works register, but the detailed construction of the spoil heap will be determined from the material it consists of. Note: any characterisation of material site won is an approximation or average, and a 45° batter has been a proven average, approximate solution. There is no way of removing uncertainty completely in creating spoil heaps, but the experience of our site supervisors practically succeeds. We will provide details in our temporary works register, with risk and category, before creating a stockpile • If contaminated material needs to be placed in a spoil heap, awaiting the results of tests or grading, for example, it will be placed on thick polythene on hard standing while it remains available. The heap will be graded, sealed, and polythene placed over it and weighted down. • The Company procedure for forming stockpiles will accompany this MS. **Standard details below:**

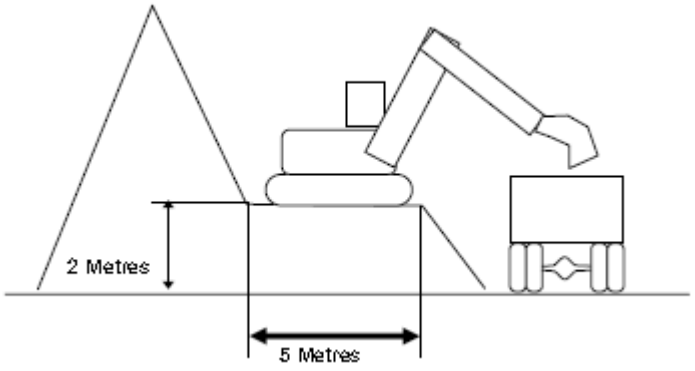


Spoil Heap Removal

- A single excavator will be used for the spoil heap removal.
- The excavator will be used to remove spoil from the heap, dragging it down from higher levels to the loading area.
- The excavator will work from a platform cut into the spoil heap, as depicted in the sketch below.



- The working platform must be cut from the spoil heap above and compacted down with the back of the bucket to form a secure and stable working area.
- The platform must not be higher than two metres and must be a minimum of 5 metres wide.
- The machine must not work closer than a metre from the edge of the platform.
- The front of the platform must always be battered back at a 45-degree angle.
- The working platform must extend the length of the spoil heap face that is being cut away with an access ramp onto the platform at both ends.
- When tracking the excavator, the operator must always face the direction of travel. When slewing around to face the direction of travel, he must be mindful of any lorries in close proximity to his position.
- The loading area will be a restricted area, with no pedestrians allowed into this area. All drivers are to stay in their vehicles at all times while waiting to be loaded.
- While loading the vehicles, the excavator will face them with the tracks pointing towards them. This will increase the stability, and the driver will have better visibility.



- This process will continue until the spoil heaps are removed down to existing ground levels.
- The machine driver will monitor and supervise all vehicular movements. He will signal when the next lorry is to come forward into the loading area. The loading area is large enough for the lorries to turn and reverse into position if necessary.

		• There are no areas with a restricted view, and as only one lorry will be reversing at a time, a banksman is not required at this point. • Where required and as necessary, continual watering down procedures will be maintained throughout the progress of the work contributing to the suppression of dust migration.

17.0	Method of work Lifting with excavators	All lifting operations on site should be planned to ensure that they can be carried out safely and that all foreseeable risks have been taken into account. Poor planning is one of the major causes of accidents arising from the use of excavators for lifting operations. **LOLER requires that the siting, setting up, and use of an excavator for lifting operations are carefully planned so that these activities can be carried out safely and efficiently. The responsibility for planning lifting operations lies with the employer who is undertaking the task. The employer should ensure that they identify one person with sufficient training, practical and theoretical knowledge and experience should be appointed to be responsible for planning and supervising the tasks. This person is known as the "Appointed Person" to BS 7121. – Alban Shehu 07584809221.** To enable lifts to be planned, supervised and carried out effectively, three categories of lifts are detailed below. The category into which a particular lift will fall depends on the assessment of the hazards associated with both the environment in which the lift is to be carried out and those associated with the load and lifting equipment. As can be seen from the table below, increases in either or both environmental or load complexity (the "Complexity Index") will lead to the lift being allocated a higher category. Having identified the hazards associated with a particular lift, a hierarchy of control measures should be applied to eliminate or control those hazards. **Lift categories (Basic / Intermediate / Complex).**

Environmental complexity (E)			
3	Complex	Complex	Complex
2	Intermediate	Intermediate	Complex
1	Basic	Intermediate	Complex
	1	2	3

Load complexity (L)

Complexity variables and constants	Lift category		
	Basic	Intermediate	Complex
Increasing environmental complexity	The excavator operator has clear sight of the load path and the load is to be placed on the ground.	The load is to be placed over an obstruction such that the excavator operator might not have clear sight of the landing area from the control position.	The load is to be placed in a trench behind a bund, without line of sight, and with proximity hazards, such as scaffolding or overhead power lines.
Constant low load complexity	A load of known weight with designated top lifting points and central centre of gravity. The load does not contain fluids, is not fragile and is inherently stable when landed.	A load of known weight with designated top lifting points and central centre of gravity. The load does not contain fluids, is not fragile and is inherently stable when landed.	A load of known weight with designated top lifting points and central centre of gravity. The load does not contain fluids, is not fragile and is inherently stable when landed.
	Complexity Index E1:L1	Complexity Index E2:L1	Complexity Index E3:L1
Increasing load complexity	A load of known weight with designated top lifting points and central centre of gravity. The load does not contain fluids, is not fragile and is inherently stable when landed.	A load of estimated weight with an estimated centre of gravity and without designated lifting points. The load does not contain fluids, is not fragile and is inherently stable when landed.	A load of estimated weight and centre of gravity and without designated lifting points. The load contains fluids, is fragile and is not stable when landed.
Constant low environmental capacity	The excavator operator has clear sight of the load path and the load is lifted to and from the ground	The excavator operator has clear sight of the load path and the load is lifted to and from the ground	The excavator operator has clear sight of the load path and the load is lifted to and from the ground
	Complexity Index E1:L1	Complexity Index E1:L2	Complexity Index E1:L3

** Only basic lifts can be undertaken in the absence of a formal lift plan produced by the Company's appointed person, providing the criteria below are met.*

Planning, Supervisory and Operating Personnel

The Lifting Team

All lifting operations should be carried out by the lifting team. The team will consist of persons carrying out the following roles:

- Appointed Person
- Lift Supervisor
- Excavator operator
- Slinger/Signaller

The exact team structure will depend on the complexity and size of the job, but all roles must be allocated and duties discharged.

Roles and Responsibilities

Appointed Person

- Planning the lifting operation for Intermediate & complex tasks; selection of the lifting equipment and lifting accessories. Instruction supervision and consultation with other responsible bodies to ensure effective collaboration as is necessary for the work to be undertaken safely.
- Ensuring that the outcomes of the planning process are recorded in a lift plan.
- Ensuring that adequate pre-operational checks, intermediate inspections, maintenance and thorough examination of the equipment have been carried out.
- Ensuring that there is an effective procedure for reporting defects and incidents and for taking any necessary corrective action.
- Taking responsibility for the organisation and control of the lifting operation.
- Ensuring that the Lift Supervisor and other lifting team members are competent to carry out their roles and are fully briefed on the lift plan's contents, scope and limits.
- Being familiar with the relevant parts of the project health and safety plan where the lifting operation is being carried out on a site where the Construction (Design and Management) Regulations 2015 apply.
- Liaising effectively with the site temporary works coordinator regarding relevant issues such as ground stability.

NOTE: The Appointed Person should have the required understanding and experience in planning lifting operations with excavators.

Lift Supervisor

- All lifting operations should be supervised by a Lift Supervisor. This role may be combined with that of a slinger signaller for basic lifts, while a separate person will be required for more complex lifts.

		NOTE: The degree of supervision required will depend on the category of lift and the outcomes of the risk assessment • The Lift Supervisor should direct and supervise the lifting operation, ensuring that it is carried out in accordance with the lift plan. The Lift Supervisor should be competent and suitably trained and should have sufficient experience to carry out all relevant duties. NOTE: Competence requirements for self-supervision might differ from those for supervising others. • The Lift Supervisor should also have sufficient authority to stop the lifting operation if they consider it dangerous to proceed. NOTE: The Appointed Person may decide to undertake the duties of the Lift Supervisor or to delegate these to another person with appropriate expertise for the lifting operation. <u>Excavator Operator</u> • The excavator operator should be responsible for the correct operation of the excavator in accordance with the manufacturer's instructions and within the safe system of work, as detailed in the lift plan. • The excavator operator should respond only to the signals from the slinger/ signaller, who should be clearly identified. • The excavator operator should: • Have the necessary competence (skills, knowledge and experience) to carry out lifting operations. • Be familiar with the excavator to be operated. Check that it is in good condition and that it has sufficient capacity to carry out the lift safely. • Ensure that they do not wear loose clothing, which could snag on the controls and lead to unintended movement. • Ensure that the bucket is removed from the machine before the lifting operation starts if the lifting attachment (hook) is fitted to the quick hitch or dipper end. • Ensure that lifting operations are only carried out with the excavator in lifting mode and the overload warning device or rated capacity indicator/limiter selected. • Ensure that they have been briefed on and understand the lift plan (for Intermediate and complex lifts). • Identify the other members of the lifting team and ensure that they are clear of the excavator's arc before operating the machine. • Check that the area where the excavator is to be positioned for the lifting operation is suitable for the task, the landing area is suitable to take the load, the area is segregated from the rest of the site and that only those personnel directly involved in the lift are within the segregated area. • Ensure that the pre-use checks of the lifting accessories to be used have been carried out and that the lifting accessories have been correctly attached to the excavator's lifting attachment. • Ensure that the excavator's control isolator (the dead man lever) is selected when the lifting accessories and load are being attached to avoid unintended movement. • Only follow signals from the designated slinger-signaller during the lifting operation, using the pre-arranged system of signals. NOTE: It is essential that the excavator operator responds immediately to an emergency stop signal from any person. <u>Slinger-signaller</u> The slinger-signaller should be properly trained in all aspects of slinging loads and signalling and be authorised by the Appointed Person – for intermediate and complex tasks. The slinger-signaller should be responsible for: • Carrying out pre-use and post-use checks of lifting accessories. • Attaching and detaching the load to and from the excavator load-lifting attachment. • Using the correct lifting accessories and other equipment in accordance with the lift plan (for intermediate & complex tasks); • Initiating and directing the safe movement of the excavator using a pre-arranged system of signals. If there is more than one slinger-signaller, only one of them should have this responsibility at any one time, depending on their position relative to the excavator. • Guiding movements of the excavator during pick and carry lifting operations. • Ensuring that they are readily identifiable as the designated Slinger/Signaller by the excavator operator. • Movement of the excavator includes pick and carry duties. All pick and carry duties will be continuously controlled by a banksman. NOTE: Where continuity of signalling is required, and this slinger-signaller is not visible to the excavator operator, another slinger-signaller or signaller will be necessary to relay signals to the excavator operator. Alternatively, other audio or visual methods may be used. A typical example of audio methods used is where a Slinger/Signaller using a radio continuously instructs the operator to lower a load, e.g. by saying "Lower…lower…lower...", and failure of this continuous instruction from the slinger-signaller indicates that the operator needs to halt all excavator movements. Lift plans will be in the excavator cabs.

18.0	<u>Method of work</u> Work in Confined Spaces	We will avoid creating confined spaces where possible. For example, benching will be done when the first manhole ring is placed. • A confined space is defined by the presence or absence of prescribed risks. It is possible but unusual for these risks to be present at excavations for foundations or drainage or for these risks to be reasonably foreseeable. The most common confined space encountered is a manhole connected to a live sewer. All such manholes encountered on this site will be treated as confined spaces. • Prior to entering any existing manhole, gas monitoring equipment (which will be kept on-site at all times) will be used to determine whether it is safe to do so. • The gas monitor will be in use all the time operatives are inside any existing manholes or excavations where it is reasonably foreseeable that the confined space procedures may be necessary. This can be determined by site investigation reports, olfactory smell or visual contaminants or recommended as a precautionary measure by geotechnical consultants. NOTE: This will be a specific requirement to address a foreseen risk, for example the presence of PAHs. In that case, a gas monitor would have to be specifically calibrated to detect a marker for PAHs, benzo-A-pyrene. The gas monitors used on site will be calibrated to methane/ carbon monoxide and hydrogen sulphide (dual toxic)/ oxygen 19%-23%/ /hydrogen sulphide and carbon dioxide. TPHs/ PAHs can be discovered by sight and smell. • If there is a hostile environment in the confined space, no entry will be attempted. If it is essential to enter, entry will be made by a specialist

		contractor using a self-contained breathing apparatus or airline. The contractor we use for specialist entry and accompaniment is ESS Safeforce • Safety harnesses and a tripod will be on-site and used by surface rescue-trained operatives when a confined space is to be entered vertically. If the confined space involves working away from a vertical access point, a harness is not acceptable, and the operative would have to be accompanied by a specialist team, or a rescue entry to bring a rescue stretcher into use would be required. • Escape B.A., good for 10 minutes, will be held at the workplace, and operatives will be harnessed while in the confined space. Extraction will be done by the topman operating the overhead winch attached to the harness. Should entry to the confined space be necessary, only the trained topman will enter using a 30-minute rescue B.A. • The tripod is suitable for manhole entry. The gantry will span excavations up to 5.0m. in width. Davit arms are suitable for fixing on shoring apparatus. When working away from vertically under the rescue apparatus, rescue will be by rescue stretcher, which requires entry by trained rescue operatives. • If a problem should arise, the emergency services are to be summoned immediately on a 999 call. If anyone has been trapped for more than 5 minutes, they will not be released until paramedics are present to deal with possible toxic shock. • Under no circumstances is anyone else to enter a manhole where an incident has occurred other than the competent person/s who has been trained to use the rescue equipment and has completed his training to work in confined spaces. • Any operative who engages in work within deep excavations or confined space entry must be trained and certificated for work in Confined Spaces, including rescue. • A 'Confined space entry permit' will be issued confirming control measures are in place for each day maximum or for each configuration of work. Any changes in support or rescue arrangements will require a new permit. The foreman will control this by issuing, discharging, revising, and ensuring the procedure applies. • There will be some confined space entry required, though most is avoidable.

19.0	Health & Safety	• All operators and personnel shall be trained and certified in functions and roles suitable to their responsibilities on the site. • Approved method statements are to be used together with site rules and restrictions to inform and advise the workforce of the manner in which the operations will be conducted. • PPE appropriate to the scheme will be issued on commencement, and the operatives and site management are to ensure the correct and continued use of it while on site. Note: Persimmon Homes sites have as standard requirement Boots, Hi Vis, Hard Hat and Gloves for anyone attending site. • All plant, access, and lifting equipment must be inspected prior to delivery and accompanied by the required documentation. Site checks will be performed according to the manufacturer's / supplier's recommendations. • Where appropriate, Operatives will be trained for Confined Space Work. • Works contained in or about live sewers are to be tested for the presence of gas and are to employ additional PPE of gauntlets, enclosure suits/overalls, breathing equipment and tripod/harness/winch. Gas monitoring equipment is to be used throughout such operations. • If it is not possible to Step or batter the Excavations Earthwork support is to be used in all excavations over 1.2m deep and at any other time as is deemed necessary. • Manual handling to be kept to a minimum, with nothing larger than 25 Kg without a suitable risk assessment. • Banksmen are to attend all machine excavations and lifting operations, especially all pick and carry duties, and direct site traffic as required. • Eye and ear protection is required when using powered tools. • All users of abrasive wheels must be abrasive wheel awareness trained & face-fit tested. • Site dump trucks, etc., are to be fitted with ROPS, seat belts & reversing warning indicators. • Existing site services are to be identified, located [using scanners], and protected throughout the works. They shall only be exposed by hand excavations to determine depths, etc. • Main traffic routes are to be established for bulk removal or transportation of materials. • Small tools will be kept in the storage container when not in use. The plant is to be left in-situ on site but will be secured and immobilised. All small drum oils will be kept in the COSHH store. **Welfare Arrangements** The Contracts Manager and Site Foreman will check and make arrangements for all operatives to use adequate welfare facilities as laid down in the Construction (Design and Management) Regulations 2015. The Contract Manager will make sure there is sufficient provision in place for the canteen, drying/changing room, offices, and toilets. **Personal Protective Equipment** - Basic PPE for our groundworkers has been assessed to be boots, hi-vis jackets, helmets and gloves at all times. Helmet mounted ear defenders, wellington boots and eye protection are available on site depending on the task in hand. - Safety helmets EN 397 - High visibility vest/jacket EN 471 Class 2 - Safety Gloves EN 388 and see full glove selection policy - Hearing protection EN 352-1/EN 352-2 is mandatory when using breakers or working in areas where noise levels rise above 85 dB(A). - Safety glasses to EN 166-F when placing concrete. - Safety goggles to EN 166 B when cutting concrete products or steel products. - Safety boots to EN 345: S1-P - Suitable footwear when standing in concrete wellingtons to EN 345 S4 - Face shield when using air pick • Vibration procedure attached, which includes assessment nomograms for all handheld vibration emitting plant • Noise assessments are attached for all noise-emitting plant.

- More specialised equipment for confined spaces, asbestos, and contaminated land will be issued as required by risk assessments from time to time and signed for in a Construction Confederation register compliant with the Construction (Design and Management) Regulations 2015.
- PPE must still be worn in hot weather: Breaks from work and drinking water are essential, but where risk assessments show the need for PPE, it must be worn, or work must be halted.
- Sunblock is available on all sites.
- Sunglasses will be issued on sites where glare is a problem and, on all sites, where there is chalk.
- Personal protective equipment is provided free of charge to our employees and will be replaced when required.

Bucket changing areas

- Suitable fencing and signage will be erected in close proximity to excavator working areas where buckets will require changing. The designated areas will move to minimise transit but will remain of the same standard even for short-duration work.
- The smallest changing area must consist of 3 heras fencing panels and a half-height barrier along the face so all 4 sides are enclosed; the requirement for the half-height barrier is to prevent 10t & below excavators from damaging any hydraulic hoses on the underside of the boom or the fencing panel.
- NOTE: all our quick hitches are fully automatic.

Noise Monitoring

The following working practices will be employed to reduce noise throughout construction activity on site:

- Where practicable, position the plant away from site boundaries, particularly on sites with neighbours within close vicinity.
- Make use of stockpiles as noise shields
- Arrange delivery times on site to suit the area.
- Use all silencing equipment available and keep panels closed on all generators and compressors.
- Switch off noisy equipment when not needed.
- Arrange traffic routes for the mobile plant so the amount of reversing required is minimised, reducing the use of reverse warning bleepers.
- If there is doubt as to noise levels or complaints, we will deploy a Class 1 noise level meter for operations. Environmental noise measurement has been done by a specialist. There is no Sec.60/61 in place.
- Observe restrictions on working hours: No plant operating before 8:00 am

Dust Monitoring

- Routine visual monitoring will be undertaken for dust at all operational areas at the site. In the event that significant visual dust is observed at the boundaries of the operational areas, action will be taken to suppress the dust. We won't wait for the dust but will also respond if it is seen in between regular preventive road cleaning and dust suppression by water from a bowser. The most useful stipulation, if we have bulk shifting of waste on haul roads, is that the exhausts vent upwards and not down at the road. If haul roads were tarmacked, this would massively reduce the problem.

This action would comprise applying water to waste stockpiles, roads, and waste treatment activities as appropriate. Site operatives and the Site Manager will inspect the site daily.

Refuelling Area

- The fuel tank will be double skinned bunded (110% of capacity) and placed in the designated refuelling area. The refuelling area will be Heras Fenced, marked out with visible signage, and the fuel tank will be positioned upon 150mm/ type 1 sitting on a sheet of Tarpaulin. During the fuelling process, a drip tray will be positioned under the connection point to ensure that any drips of diesel are caught in the tray. The same process applies to filling petrol tools/cans, etc. If the hose has been contained within the secondary bund and submersed in diesel, the hose itself must be located within the drip tray; take the lid off if necessary. A spill kit and nappy sacks will be there for any emergency.
- A fire point with 2no. CO2 extinguishers will be placed close to the refuelling area and appropriately signed.

Storage of tools & materials

- Small tools will be kept in the storage container when not in use. Plant is to be left in-situ on site but will be secured and immobilised. All small drum oils are to be kept in the CoSHH store.
- Materials that are on pallets will not be stacked more than two pallets high.
- Lightweight materials such as cellcore, cordek, and polystyrene panels used for floors will be weighted down.

Interface with other trades

- Coordinating work with other trades.
- From the arrival of other trades on site, work will be coordinated by our Site foreman.
- Our work will be segregated from other trades.
- Excavations will be guarded to prevent unauthorised access. We will not undermine scaffolding at later stages of the job and will not work underneath scaffolding. Our machinery has flashing hazard lights, and all reversing will be kept to a minimum.
- Note that flashing lights interfere with laser levels. Manufacturers have found no way around this problem. So, lights should be switched off when the laser level is in use, but only in the area our site engineer defines as where interference could occur. This is not a blanket excuse for the whole site.

Housekeeping

- Materials will only be stored in designated areas. Work areas will be cleared of waste as soon as practical, including materials surplus to a task. If this does not happen in a timely fashion, the working area will become constricted, and separation will become difficult. If we leave behind waste or surplus materials, this makes distancing difficult for others. We should require this of other trades before we enter a new work area.
- Any waste materials to be disposed of in the appropriate skip.
- Waste from disposal bins around the site, including in offices, must be removed on a regular basis during the day.
- Clear access at all times must be maintained should the emergency services be required.

Reporting of Accidents

- Any accidents whatsoever arising out of or in connection with the site works on or off the Site which cause personal injury or property damage

shall be reported to the OHSEQ department immediately, in writing, giving full details and statements of witnesses. In the event of a reportable accident the Health & Safety Executive shall be informed and an F2508 submitted.

- All accidents are to be recorded in the Accident Book and reported to the Client.
- All near misses will be reported to the Client.
- If CPR is required, then the following guidelines have been extracted from the latest Resuscitation Council UK Statement on COVID-19 in relation to CPR and resuscitation:
- Because of the heightened awareness of the possibility that the victim may have COVID-19, Resuscitation Council UK offers this advice:
- Recognise cardiac arrest by looking for the absence of signs of life and the absence of normal breathing. Do not listen or feel for breathing by placing your ear and cheek close to the patient's mouth. If you are in any doubt about confirming cardiac arrest, the default position is to start chest compressions until help arrives.
- Make sure an ambulance is on its way.
- If there is a perceived risk of infection, rescuers should place a cloth/towel over the victim's mouth and nose and attempt compression-only CPR and early defibrillation until the ambulance (or advanced care team) arrives. Put hands together in the middle of the chest and push hard and fast.
- Early use of a defibrillator significantly increases the person's chances of survival and does not increase the risk of infection.
- If the rescuer has access to personal protective equipment (PPE) (e.g. face mask, disposable gloves, eye protection), these should be worn.

- Any accidents whatsoever arising out of or in connection with the site works on or off the Site which cause personal injury or property damage shall be reported to the OHSEQ department immediately, in writing, giving full details and statements of witnesses. In the event of a reportable accident the Health & Safety Executive shall be informed and an F2508 submitted.
- All accidents are to be recorded in the Accident Book and reported to the Client.
- All near misses will be reported to the Client /Principal Contractor.
- Trained First Aider Mihai Mereuta will be responsible for all treatment to operatives on site.
- First Aid equipment and facilities shall be available in the Houlihan & Co site office

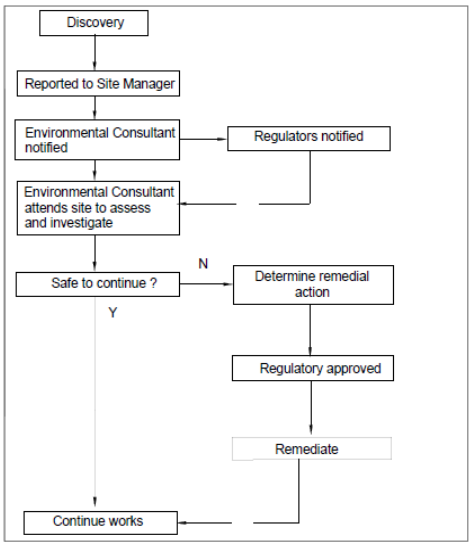
H&Co First Aider will make entries in the Accident Book if the IP does not want to and agrees to the entry.

20.0	Discovery Strategy Contamination	Unexpected soil conditions may still be encountered during construction. Every ground worker will receive TBT/asbestos Awareness training before starting work on-site. Examples may include oily pockets within the soil, pockets of cement boarding or fibrous materials within the soil, black ashy materials, soils exhibiting strong odours, brightly coloured materials and former structures or brickwork. Should previously undiscovered contamination be encountered during construction, this should be reported to the Site Manager immediately in order that any necessary inspection may be made. A watching brief approach is to be adopted during the various phases of the site's development such that in the event of suspicious conditions or materials being encountered, the Environmental Consultant can attend the site to inspect the 'discovery'. Records should be kept, and samples submitted for analysis where

conditions encountered are not as anticipated. The results of any such testing should be sent to the Local Authority for consultation.
Depending on the type, nature and extent of any such 'discovery', it may be necessary to halt works in that location until such time as the assessment has been completed. This should be reviewed on a 'discovery' specific basis and in conjunction with regulatory consultation.
As a general guide, where such unexpected conditions are encountered, the following approach is recommended:

- All discoveries are to be reported to the Site Manager immediately, and works at that location are to halt until further notice.
- The area should be cordoned off using an appropriate barrier system.
- The Site Manager is to report any such discoveries to the Client and the Environmental Consultant: - RSK
- Following notification from the Site Manager, the Environmental Consultant shall discuss the discovery with the Local Authority and, if necessary, arrange to meet an Officer on site to view it.
- The Environmental Consultant shall attend the site to record the location, extent and nature of the discovery and implement an appropriate sampling and analysis regime, taking due account of the type and nature of the discovery, known and probable land uses in that area of the site.
- Where remedial action is required, regulatory consultation and approval will be sought.
- The environmental consultant will produce a record and hold it on site (with copies held by the Environmental Consultant, Client, and Local Authority) detailing the discovery, assessment works undertaken, findings, confirmation either of no action required or detailing the remedial action taken and validation thereof.

The process is shown below.



Waste Disposal

Duty of Care

As the persons undertaking construction work and specifying a particular waste disposal carrier and receiver, Houlihan & Co. have a duty of care under the Environmental Protection Act 1990. We must and will take all reasonable measures:

- To prevent any contravention by another person of the legal requirements associated with depositing, treating or keeping controlled waste or its transport.
- To prevent the escape of waste from our control or that of any other person.
  On the transfer of waste, ensure that the transfer is only to an authorised person and that there is a written description of the controlled waste, which will enable other persons to understand clearly the nature of the waste and comply with the duty to prevent its escape.

(An authorised person is a waste collection authority or the holder of a waste management licence.)

Keeping Waste Safely

To comply with our duty of care, we must ensure that the waste is not affected by:

- Corrosion or wear of waste containers.
- Accidental spillage or leakage.
- Accidents or weather breaking contained waste open and allowing its escape.
- Waste blowing away or falling whilst stored or transported.
- Scavenging of waste by vandals, thieves, children, trespassers or animals.

The site perimeter will be secured and signed.
Stockpile areas will be clearly delineated and set on an impervious membrane.
Dust will be controlled by damping down or covering.

		Transferring Waste Waste can only be transferred to an authorised person. The Waste (England and Wales) Regulations 2011 detail the transfer note arrangements. The note must be completed by a responsible person from the company producing the waste, not by the carrier. The responsible person will consider whether the waste will require a special container to prevent its escape (e.g. a closed skip for asbestos) or if the waste can be mixed safely with other waste. Part of the duty of care obligation is that checks are carried out before waste is transferred. Tip licences in particular must be carefully checked to ensure that the tip can receive the type of material being sent. Carriers' original registration certificates, not photocopies, must be carefully inspected. A Waste Transfer Note (WTN) must be completed and signed by both the person handing over the waste and the person receiving it. It must contain enough information about the waste for it to be handled safely and either recovered or disposed of legally. The WTN must include: • a description of the waste • any processes the waste has been through • how the waste is contained or packaged • the quantity of the waste • the place, date and time of transfer • the name and address of both parties • details of the permit, licence or exemption of the person receiving the waste • the appropriate European Waste Catalogue (EWC) code for the waste • a declaration that you have applied the waste management hierarchy has been applied • the 2007 Standard Industrial Classification (SIC) code of the person transferring the waste • The producer is most able to describe their waste accurately. Using non-specific terms such as 'general waste' is unacceptable. • Separate paperwork must be completed for hazardous waste.
21.0	Silt Management & Dewatering	• There are no existing streams or ditches entering the site. Surface water management has been provided by the Client, Persimmon Homes. **Measures on Enabling Phase and Preparatory Earthworks.** • Stripping topsoil must be done in stages to maintain as much vegetation cover across the site as possible. • Retention of vegetation as far as reasonably practicable along south-western boundaries to promote infiltration of any surface water and silt run-off. • Haul road will be topped with a tarmac running course, easy to clean with a road sweeper. • A jet wash and cattle grid will be installed at the site's exit to clean the wheels of vehicles leaving the site. • The designated car park will be topped with stone and be maintained mud-free. **Additional Measures During Construction Phase** • Temporary infiltration ditches will be installed at three different locations, as shown in Drawing "SA00409-3551-C-SW-GA Surface Water Management Plan." The good infiltration rate will prevent any flooding outside the ditches, both inside and outside of the site. • The ditches will be installed before the start of the construction works, after the demolition and site clearance. They will be approximately 500mm deep, 1m wide and with 1 in 4 side slopes. • Haybale and silt matting are going to be installed inside the ditches at approximately 25m spacing for water cleaning purposes. • Haybale and matting will be changed monthly. • The placement of gulley protection (specially designed gulley guards or standard protection - straw and terram) in all gullies during construction, which are to be inspected and replaced/cleaned when necessary. • Minimising the movement of the plant on and off roads to prevent the tracking of excess soil onto roads and highways. • The installation of hardstanding areas to the front of all plots to enable 'clean' forklift access. • The placement of hardstanding or topsoil at the earliest opportunity to control surface runoff from completed areas. • Avoid tracking on permeable paving areas once installed and otherwise maintaining paving areas. **Monitoring Procedures and Records** • Inspection of infiltration ditches, silt traps and manholes to monitor the discharge entering the drainage system and the sensitive receptors around all site boundaries. • Maintenance, cleaning and replacement of haybales, silt matting, and Terram as required. • Completing the Environment Checklist (Site Audit form) weekly will help document any changes on site and identify any changes needed to the protection systems as the development progresses. • The Site-Specific Environmental Action Plan (SSEAP) will be reviewed using the Environmental Checklist and updated when necessary to reflect site conditions and operations changes. • All records will be reviewed monthly. In the event of heavy rainfall breaching protective measures, Persimmon Homes Environmental Department must be contacted separately from the Health and Safety Department of Houlihan & Co. **Dewatering** • When excavations need dewatering, pumping from a sump pit will be prioritised over pumping to a vegetated area away from sensitive receptors to allow infiltration to the ground. • All pumping operations will be agreed upon with local site management, who will gain approval from the Contracts Manager. The SHE Advisor will be notified of pumping intentions. • All dewatering should utilise a 2" pump and be through a Dirtbag onto an area of gravel or straw bales at an approved designated vegetated

		sacrificial area located away from sensitive receptors. If pumping near any drainage ditch or surface water receptor, silt fencing will be placed down a topographic gradient. • If over-pumping into the surface water system (including use of a completed attenuation basin as collection areas) is proposed, ensure any necessary permits and adequate protection measures (potentially comprising, but not limited to, use of filter bags or a settlement tank) are in place to prevent discharge of silt into the surface water drainage system. The implemented measures should be frequently monitored and maintained to prevent the discharge of silt into the drainage system. The placement of silt matting at the discharge point within the attenuation basin may limit erosion of the banks.

22.0	COSHH	COSHH Register: refer to the OHSEQ notice board in the site office: • AdBlue • Asphalt Materials • Bituthene Primer • Bituthene Adhesive Primer • Butane - Calor • Cement – packaged • Cement colouring – Sealotone • Diesel • JCB Grease • JCB Hydraulic Fluid • Engine Oil • Marking Paint – Powerline • Mortar Plasticiser – Sealocrete • Petrol • Pipe Joint Lubricant – Hepworth/ Osma • Sika block paving seal • Silica • Weedkiller Doff • Wet Concrete • White spirit

23.0	Immediate Emergency Procedures	1. In case of an accident, Phone 999 and ask for the Emergency Services. 2. Shut Down all the Plant and Cordon off the Area. 3. Inform the Main Contractor Site Manager. 4. Contact Alban Shehu at 07584 809221 5. In case of Fire, follow Signage and meet at the Assembly point near the front gate:
Author:		Alban Shehu

Contract: Persimmon Homes, Horsmonden	**OPERATION: (Site Specific) Work on Highway.**		
ORIGINATED BY: A. Shehu	**DATE: 17.06.2025**	**APPROVED BY:** Steve Palmer	**RE-ASSESS:** At least every 3mths or following an incident or change in working equipment or processes

Risk Rating: Severity (S) & Likelihood (L) as 1 (low), 2, or 3 (high), multiplied to give Overall Rating (R) 1 (low) to 9 (high) for priority actions

A=Operative: B=Others on Site including client's staff: C=Public

Hazard	People at Risk			Risk Rating			Control Measures STANDARD PPE TO BE WORN ON SITE (HI-VIZ, SAFETY FOOTWEAR, HEAD PROTECTION). ADDITIONAL/ALTERNATIVE PPE TO BE WORN WHEN REQUIRED BY RISK ASSESSMENT	Residual Risk Rating		
	A	B	C	S 1,2,3	L 1,2,3	R 1 - 9		S 1,2,3	L 1,2,3	R 1 - 9
Oil, fuel spills.	Y	Y	Y	3	2	6	**Spillage of oil, fuels**. • Steel double-skinned bunded (110% of tank's capacity) tank set up in the refuelling area. The refuelling area will be Heras fenced, and the fuel tank will be positioned upon 150mm/ Type 1 sitting on a sheet of Tarpaulin. The refuelling area will be allocated to a secure location on site away from the Network Rail zone of influence. • Environmental procedure for spills and hydraulic hose bursts. • Preventive maintenance of machines. • Daily pre-operation inspection checks are carried out & recorded weekly as a minimum. • Check lifting eye prior to lifting. • Lifting eye to have compatible shackle. • Plant "nappy" under compressor. • Newest compressors are internally bunded.	3	1	3
All works Leptospirosis	Y	Y	N	2	3	6	• The likelihood of rats and, hence, leptospirosis has been made clear to all operatives at their company induction. • The main defence against the disease is personal hygiene, including not smoking on site. • The HSE information leaflet has been used in toolbox talks and is issued to operatives • Prevent/discourage rats from coming onto the site. • Ensure adequate pest control provisions are in place around site and welfare facilities. • Do not leave scraps of food lying around to attract them. • Ensure a waterproof plaster covers cuts, grazes, and open wounds. • Wear waterproof gloves and clothing when working in wet conditions. • Wash your hands and arms thoroughly before eating, drinking and smoking. • Report any ill health to your Supervisor or Manager. • If you start to suffer from what seems like flu but have reason to believe that it may be leptospirosis see your doctor as a matter of urgency. Inform your GP of your occupation. • The internal/external refuse storage area is regularly cleaned and monitored. • All waste bins were kept in a clean condition and emptied on a frequent basis. • Non-toxic monitoring bait devices are used for pest control within the food preparation and food storage areas. • Visual checks carried out by employees and detailed records are maintained when evidence of pest activity has been found initiating any follow-up action.	2	1	2

Delivering, unloading, and reloading vehicles on-site Mechanical failure, road traffic incident, contact with other pedestrians.	Y	Y	N	3	3	6	• Only trained and competent site staff to complete tasks. • **Staff to follow prescribed safe systems of work detailed under the sub-heading "Plant and vehicle preparation and delivery" of this document.** • If at any point, the safe systems of work detailed in this document are deemed insufficient, work is to stop, a risk assessment shall be completed and new safe systems of work developed and implemented. • All deliveries are to be undertaken on-site within a controlled offloading pre-planned area, not in the public domain.	3	1	3
Vehicle movements Vehicles, including mobile plants, may come into contact with workers, other plants/vehicles, or property, resulting in potentially serious injury to persons and/or damage to plants/property.	Y	Y	N	3	3	9	• All site personnel will be made aware of the requirements of the Principal Contractor's traffic management arrangements at the site induction and updated whenever necessary. • Vehicle banksman are to be suitably trained. • Suitable safety signs will be displayed on site instructing drivers not to use mobile phones, not to reverse without a banksman and to stop if they cannot see the banksman. • The use of mobile phones is not permitted within the processing area. • All persons on site, including lorry drivers outside of their cabs, are to wear the PPE required by site rules, including a high-visibility vest or coat. • All vehicles must travel at a safe speed for the conditions below the site speed limit, which is displayed on site. Within the processing area, the speed limit is 5mph. • Access routes on site will be formed with a safe incline, and bunds or barriers will be provided to prevent vehicles from falling into excavations or off-ramps.	3	1	3
Operating Plant and Equipment Contact between plant and operatives resulting in possible serious injury. Plant overturning resulting in injury to the operator or other persons Failure of lifting equipment resulting in persons being struck by falling loads/equipment	Y	Y	N	3	3	9	• Establish a clear work area and cordon off if necessary to prevent pedestrian / unauthorised access. Site management to determine the need for fencing/barriers to ensure operatives not involved in the task do not enter the works area. • Operatives must never stand under an excavator bucket or a suspended load. • Only authorised competent people are allowed to operate the plant. • All plant operators to hold valid qualifications for the category of plant they operate. • All machinery to be inspected before use and, where required, to have valid thorough examination certificates. • Operators are required to complete and record daily pre-use inspections. The operator must ensure that any defects/damage are reported to H&Co's Site Manager before operating the plant. • All mobile plant to have flashing beacons and 360-degree vision ability. Loading shoves to have a reversing audible warning system. • Plant to travel at a safe speed for the conditions and always within the site speed limit. • Keys are to be removed from the plant when not in use and safely secured at the end of the shift. • The plant is only to be used for the purpose for which it is intended and in conditions for which it is intended. • Plant must be banked in areas where pedestrians are present. • Access routes on site will be formed with a safe incline, and bunds or barriers will be provided to prevent any mobile plant from falling into excavations or off ramps.	3	1	3
Lifting with site excavators Failing Loads, Trapping fingers, Load swing causing injury, Falls from height, Crushing	Y	Y	N	3	3	9	• **Staff to follow prescribed safe systems of work detailed under the sub-heading "Lifting with excavators" of this document.** • Loads to be slung by competent operatives. • Banksman: Ensure that no lifts are taken over the adjacent work area and that all loads are correctly slung. • Basic task lifts are to be undertaken without the approval of the company's appointed person. • Intermediate & complex tasks require a specific lift plan. • No lifting above-populated areas. • No lifting with a bucket attached.	3	1	3

							• Prior to the instruction to lift the slinger signaller to stand clear of the load • Keep the load as low as possible and use guide ropes on 2 corners where necessary • All delivery vehicles to have edge protection fitted. If delivery vehicles have no edge protection - TURN THE LORRY AWAY. • All excavator drivers are to hold current CPCS cards. being operated • Excavators to be thoroughly examined at 12 monthly intervals. • All excavators are to have a daily inspection (F91) to be carried out and recorded by the machine operator • All accessories are to be checked prior to use by the slinger signaller. All accessories are to have 6-monthly thorough inspections. Slinger signaller to ensure lifting accessories have sufficient SWL • IF IN DOUBT CONSULT H&Cos APPOINTED PERSON – Alban Shehu: 07584809221			
Quick Hitch devices on excavators Operatives being crushed by falling buckets, possibly fatal or very serious injury.	Y	Y	N	3	2	6	• Identify the type of quick hitch on each excavator and ensure you know if it requires pins to be fitted. Test that the bucket is correctly attached. (IE Shake, rattle and roll) • The machine will be checked regularly. Faults must be reported to the site manager immediately, and the machine will be stood down until repaired. • Where required, pins must be fitted after changing the buckets; this is the driver's responsibility, not the nearest operative. Operatives are not to stand underneath buckets at any time.	3	1	3
Work potentially generating dust- vehicle movements on site Inhalation of silica, asbestos, and other respirable airborne contaminants, environmental nuisance	Y	Y	Y	3	2	6	• Speed restricted to 5mph. • Lorries to be specified on hire as having upward-directed exhausts. • PC to control forklift movements. • Hard top to roads, haul roads where practicable. • Road cleaning. • Drop distances from bucket into lorry or dumper skip to be minimised. • Traffic marshal to explain routes on site. • Any concrete and tarmac cutting will be carried out using a water-suppression pressurised bottle. • Water bowser will be used when it is required (especially in the summertime)	3	1	3
Work potentially generating dust- the bulk movement of materials Inhalation of silica, an environmental nuisance	Y	Y	Y	3	2	6	• Scrape by a blade instead of digging and a dumper transfer. • Avoid double handling whenever possible. • Cover loads in motion & static spoils on site. • Limit drop distances to a minimum. • Continuous micro spray as new surfaces are exposed to spoil heaps in dry weather. • Use a larger plant to minimise the number of movements. • Retain vegetation until removed just in time. • Road cleaning on and off-site.	3	1	3
Machine operations Maintenance work on plant- greasing, hydraulic oil leaks, pressurising tracks, Oil, and fuel spills.	Y	Y	N	3	2	6	• Re-fuelling area. • Environmental procedure for spills and hydraulic hose bursts. • Fluids under pressure, whether toxic or not, carry the risk of serious harm if injected. • Minor entry wound belies harm caused as fluid blocks veins or arteries. • No fault should be traced without Kevlar gloves; only Houlihan-issue grease guns should be used. • Fitters to adjust excavator tracks unless the driver has had training. • Preventive maintenance of machines. • Daily pre-operation inspection checks are carried out & recorded weekly as a minimum.	3	1	3

Compressor operations Oil, fuel spills.	Y	Y	N	2	2	4	• Re-fuelling area. • Environmental procedure for spills and hydraulic hose bursts. • Preventive maintenance of machines. • Daily pre-operation inspection checks are carried out & recorded weekly as a minimum. • Check the lifting eye prior to lifting. • Whip check fitting attached to the hose inlet. • Lifting eye to have compatible shackles. • Plant "nappy" under compressor. • The newest compressors are internally bound.	2	1	2
Use of a vibrating plant **H**and **A**rm **V**ibration	Y	N	N	3	2	6	• Plant is selected for low vibration characteristics, and a full assessment has been carried out for tasks where vibration exposure is expected. • The intention is not to expose any operative to even the lower action value. • Drilling and vibrating concrete works of short duration. • Tools should be used for their designated purpose. • All operations have been timed for trigger times, and manufacturers' information regarding vibration has been checked against OPERC emission test results. • As the trigger time is critical, this will be periodically checked by timing actual operations- monitoring sheets for the site supervisor in the vibration pack. • HSE nomogram for each item of plant. • In addition, equipment will be tested using an accelerometer to monitor vibration levels and trigger time (exposure) by process: the results will inform purchasing policy and decision-making regarding continuous safe use. • The plant department will contact the supplier to ensure that they are aware of any engineering control measures that can be installed to minimise vibration levels. • Any damaged equipment must be taken out of use and reported. • All work equipment must have appropriate guards in place. If guards are missing, the item may not be used. • Our vibration assessments will be on-site. We do not keep registers, because it involves recording trigger time and is usually not done properly. Our assessments are based on operations which have been timed, as trigger times, by observing operations and collecting the seconds of use as against the ancillary work where there is no vibration. We do not accept it is a good idea to record harm rather than avoiding it,	3	1	3
Use of a plant emitting noise **Noise-Induced H**earing **L**oss	Y	Y	N	3	2	6	• Plant has been selected for low noise rating. Ear defenders and ear plugs are available to the workforce. Where the noise at the workface reaches 80dBA ear protection will be worn as company policy. • It is not expected that anyone will be exposed to noise of 90dBA or over, but where the level exceeds 85dBA ear protection must be worn and we will try to reduce the noise dose by reduction at source. • All noisy areas display mandatory 'Ear Protection' signs. • Site monitoring by process and site-specific operations if necessary. • Acoustic blankets are deployed at the site boundary and/ or locally to the source, depending on ongoing monitoring and site-specific requirements. • Plant department to maintain contact with suppliers to ensure that they're aware of any engineering control measures that can be installed to minimise noise levels. • Any damaged equipment must be taken out of use and reported. • All work equipment must have appropriate guards in place. If guards are missing, the item may not be used.	3	1	3

							• Wherever possible, noise is combated at the source by enclosures and engineering controls. Acoustic enclosures and engineering controls are regularly inspected to ensure they achieve the designed noise reduction. • Access to noisy areas is restricted to only those persons who have to enter the zone, thereby reducing the number of persons exposed by distance.			
Cutting concrete – Kerbs, slabs and other PCC items. Inhalation of respirable silica, strike by flying fragments. Vibration.	Y	Y	N	3	3	9	• Kerbs cut in an area excluding the public and other operatives. physical screening positioned to protect other workers and passers-by. • A battery-operated water dust suppression or pressurised bottle unit must be used on disc cutters (on diamond-tipped blades only). • Correct blade used on disc cutters. • Filter masks to P3 standard worn (personal issue, disposable, fit-tested). • Stihl disc cutters selected for low vibration. • Task will not require trigger time over lower action levels. Nomogram for specific work equipment on site. • COSHH assessment in place. • Abrasive wheel training **must** be provided to all abrasive wheel users. • Eye protection to BS EN166:1995 1. B will be worn	3	1	3
Placing concrete-backing kerbs, slabs, and strip footings Contact with wet concrete causes chemical burns, irritant or contact dermatitis	Y	N	N	2	2	4	• Concrete delivered ready mixed to avoid site mixing where practicable. • The chutes from RM lorries will be opened out and directed by the driver ONLY. • Mix for backing kerbs will be dry to prevent slump, and this will minimise the possibility of splash. • Placing by hand from the dumper skip. PPE will include nitrile gloves and clothing to cover up arms and legs. • Standing on concrete should be avoided if possible. • Use of a vibrating poker is limited where possible and selected for low vibration. • COSHH assessment in place	2	1	2
Lifting and placing kerbs/slabs Injury to back from the manual handling of standard HB2 pre-cast concrete kerbs	Y	N	N	3	3	9	• HB2 kerbs weigh 67kg: substitution of lighter kerbs is only possible if permitted in the specification. • A wheelbarrow for lifting kerbs will be used: the push force will be only 5kg after the kerb is levered off the ground by pressing down on the handle. • Easylifter replaces the need to use the machines in a constricted space and with passing traffic. • Transit carried out safely by Probst kerb Caddy. • **Refer to the full Houlihan & Co slab/kerb laying manual handling assessment**	3	1	3

Confined spaces in manholes
Asphyxiation, Poisoning from toxic gases, Injuries from exploding or igniting gases, Infection from contaminated water, e.g. Weils disease, Drowning, Back injuries from falls or collisions with structures/ fittings in the working area.
	Y	N	N	3	3	9	• Wherever possible, consider doing the work from outside the space
							• A Permit to Work system should be in operation.
							• A detailed assessment of the task has been carried out:
							  • Available ventilation
							  • The potential for hazardous gases/atmosphere to be present
							  • Hygiene/welfare requirements.
							• The local rescue services have been informed of the work and where necessary, advice or inspection has been sought. (High risk operations).
							• Suitable detection equipment is on-site and used prior to each entry and continually during the presence of people in confined spaces.
							• Emergency breathing apparatus and harnesses are readily available on site.
							• Precautions for the use of plant and equipment or heavier-than-air gases are established.
							• Flood potential and isolation have been checked.
							• Emergency procedures are fully developed and have been adequately rehearsed.
							• Workers must be physically fit and competent to enter and undertake work in confined spaces
							• Effective communication should be established between workers in the confined space and those outside the area
								3	1	3

							• The atmosphere of the confined space should be monitored for the presence of and levels of gases and must always be tested before entry. • If dangerous fumes are present, suitable breathing apparatus should be worn, and the person entering the confined space should wear a safety rope, one end of each end is held by the person keeping watch outside • Equipment which may release excess oxygen or engines which emit carbon monoxide gas should not be used in confined spaces • Smoking, naked lights, sparking tools, and any nylon material should be prohibited • If working in contact with contaminated water, e.g. in sewers, workers must be inoculated against serious disease. Any skin cuts should be covered • Washing facilities should be available to encourage good hygiene • Trenches deeper than 4.5m should be treated as confined spaces. • Manholes to be vented for 30 minutes before entering. • Gas monitor to be placed in manhole 30 minutes before entering. • A confined space work permit is to be obtained before entering. • Operatives to be briefed on an escape plan. • Operatives to be trained for confined space working. • Topman to be present at all times. • Rescue harness and tripod to be used. • Escape kit to be used where necessary. • Benching should be carried out with the cover slab removed to allow air entry.			
Working with live sewers/Sewer diversions Gastroenteritis, Weils disease, Infection of the skin or eyes, and/or occupational asthma, resulting in attacks of breathlessness, chest tightness and wheezing produced by the inhalation of living or dead organisms	Y	N	N	3	3	9	All the above items are covered in **Confined spaces in manholes** • Overpumping is to be carried out where operatives need to enter a live sewer. • Ensure that employees and line management understand the risks through proper instruction, training and supervision • Waterproof gloves and overalls to be worn at all times • Gas monitors to be in place • Good personal hygiene • Flow to be diverted where possible. • Management to ensure a good standard of welfare is kept on site prior to any live sewerage works taking place.	3	1	3
All work in the area- live services Contact with live service resulting in burns from flashover or electric shock. Toxic or flammable gases from a damaged sewer pipe. Damaged or severed pipes leading to leakage of substances, resulting in potential flood, gas leak, explosion or fire. Contact with severed fibre optic cables	Y	Y	N	3	3	9	• A Permit to dig will be completed and authorised by the client site team. • **Works must be undertaken as per H&Co's safe digging procedure, "works on/near underground services".** • Operatives are to receive full TBT relating to site services provided by the services coordinator prior to starting work. • Cable and metal location equipment must be duly calibrated and in good working order. Operatives appointed will be trained on how to locate services using the EziSystem & safe digging techniques as set out in the H&Co works/on near underground services procedure. (Note: Lighting columns may be dormant during the day, so the generator should be used to trace cables.) • Utility plans from network operators must be reviewed in conjunction with a visual survey to be carried out for any service covers nearby that may indicate buried services in the trench line. • Located services, such as gas, electricity, etc., will be identified and indicated clearly by the survey operative using marker paint on the ground, with depth estimations if possible. • Operatives **will** now wear flame resistant clothing (a Nomex material by J.Ross) for all close proximity work to any exposed cable. (Note: The clothing can be used in layers to reduce the heat burden of wearing it, but as UKPN have not provided an arc flash risk assessment giving us a calorific value to inform clothing selection, we will assume the worst-case scenario and wear the highest level of protection).	3	1	3

Work near overhead lines Contact with live conductor, arcing	Y	Y	N	3	3	9	• An air pick must accompany every excavation on/near underground services to loosen up fill material, and insulated tools must be used to remove loose material only. Forced digging must be avoided if ground conditions permit. • No mechanical digging within 1m of a known service. • All workers will practise safe digging practices when hand digging in the proximity of an underground service. For example, an air pick must always be the first tool of choice to loosen up backfill material, spades/shovels should be used, not picks or power tools, and horizontal digging should be used to locate the exact position of a cable to avoid fracturing it. • All exposed services must be supported. • It should be assumed that all services are "Live" until proven otherwise. • If a service is struck cease work immediately and report to site management. • The quality of backfill is important for future site users. If a main has to be exposed for service connections- only granular material should be used. No cohesive soil and marker tape is essential. Engineers should record sufficient data before backfilling for the PAS256 recording. • Control measures set out in GS6. • A site visit from the DNO required establishing sag and swing, and advice on safety clearance- (GS6 survey). • Routes to transit are set out with goalposts at entry and exit and sideways barriers to delineate the width of access. • Working underneath will require notification to DNO, a grant of permission, probably with conditions, and limiters/ chaining back of booms, etc. or use of a small plant, in either case, to prevent absolute reach of the plant into space above the clearance limit.	3	1	3
Presence of contaminated ground Chemical injury, skin irritants, burns, blindness, death	Y	N	N	2	2	4	• Ground conditions must be established by a survey to identify the type of ground in which the excavation is to be carried out • Contaminants will be removed by a remediation contractor and validation/clearance report must be issued to us from the client. • Discovery procedure in place for reporting unusual conditions not previously discovered in surveys, e.g. unusual smells, bright coloured layers in the ground	2	1	2
Excavations Noise / Vibration Weakening of adjacent structures Ingress of water Falls of persons Falling materials or plant Underground services – gas, electricity or water Toxic or flammable gas Oxygen deficiency "Boiling" Collapse of excavation Presence of contaminated ground	Y	Y	N	3	3	9	• Permit to Excavate will be completed and authorised by the Contractors' Management. • Ground conditions must be established by a survey to identify the type of ground in which the excavation is to be carried out • Prior to the commencement of excavation, the need for and method of support should be determined • Support materials will be on site before excavation starts • If there is a possibility of underground services being present, the area will be surveyed using a suitable detection instrument • Excavations will be inspected prior to each shift, after any event likely to affect strength or stability, and after any accidental fall of material. A logged report must be carried out every seven days. • No heavy plant within 2m of an unsupported excavation. • Excavations should be assessed by a competent individual, nominally the site supervisor. Where necessary, the sides of the excavation will be battered to the angle of repose or stepped, making sure the step is equal to the depth of the excavation. • Where an assessment establishes possible ventilation problems, a gas monitor will be utilised to monitor the atmosphere before entry • Plant and materials will be kept away from the side of the excavations to prevent undue pressure or ingress of exhaust fumes • Excavations must be suitably illuminated • To keep the atmosphere healthy, ventilating equipment should be used in confined areas • If the depth of the excavation is two metres or more, or if the depth is less but there is a particular risk of anybody falling, suitable guard-rails will be placed, and suitable access arrangements, such as ladders or ramps, should be provided • If there is a risk of water ingress, suitable methods and/or equipment should be provided to either prevent the entry of water or to remove water, e.g. water pumps	3	1	3

							• If a plant could fall into the excavation, timber baulks should be provided • Inspections of excavations will be carried out prior to each shift, after any event likely to affect strength or stability, and after any accidental fall of material • Suitable gloves must be worn at all times when working in/around excavations. • All excavations **must** be fenced off with suitable fencing and signage. Pins and bunting/barriers may be suitable for shallow trenches. Heras Fencing should be used for deep trenches.			
Working from height with loose materials/plant Falling material, debris striking operatives/visitors	Y	Y	N	2	2	4	• Plant and materials will be kept away from the side of excavations to prevent undue pressure or ingress of exhaust fumes. • If a plant could fall into the excavation, timber baulks should be provided • All loose material is to be cleared at the end of every shift. • No loose material to be left in close proximity to excavation where there could be a risk of material falling. • All excavations **must** be fenced off with suitable fencing and signage.	2	1	2
General - Manual Handling Strained/pulled muscles, abrasions, cuts, foot injuries, back strain, Slip/trips/falls	Y	Y	N	3	2	6	• Assess the task; use appropriate lifting equipment/lifting accessories for the activity. Always use mechanical lifting aids where necessary. • Assess the weight of the load; avoid lifting heavy loads of more than 20kg. • Break the load down into smaller, lighter parts. • Plan the work to avoid excessive carrying. • Change the layout of the work if possible. • Ensure work areas are clean and tidy, free from tripping and slipping hazards. • Check individual capabilities of those carrying out manual handling operations. • The weight of the load is checked before any lifting commences. • Mechanical equipment such as forklift trucks, pallet trucks, trolleys, and sack barrows is used to reduce employees' handling injuries. • Ensure a clear working area for general distribution and installation. • Environmental conditions, including unobstructed walkways, no tripping hazards, adequate lighting etc.	3	1	3
Concrete operations. Vibration, Concrete penetration of eyes, nose or ears due to an uncontrolled surge during cleaning operations or clearing of blockages, Exposure burns to skin	Y	N	N	2	2	4	• PPE & washing facilities should be provided. • Regular toolbox talk training must be provided RE PPE, burn injuries, dermatitis, etc. • Appropriate personal protective equipment (PPE) should be worn • Coveralls to be worn whilst concreting – there should be no exposed skin. • The accumulation of concrete spillage should be prevented. • Glasses to be worn whilst concreting. • Walking boards' are to be in place prior to slab/beams/ crane base pour commencing for safe passage of concrete workers. • Concrete Poker can be used no more than 3hr that is the Daily Exposure Action Value (EAV). (Dally Exposure Limit Value ELV is reached over 12 hours)	2	1	2
Setting out with instruments / surveying with cobras/rods Slips/trips / falls, Service strikes, cobra/rod striking operative.	Y	Y	N	2	2	4	• Read and understand setting out and service drawings prior to setting out. • Pins and stakes are only to be installed when no services are present. The site engineer must review the stat plans and CAT survey the area. If services are remotely likely, PinSafe setting out instruments **MUST** be used. • Cat scanning of the area to take place prior to excavation. • Line marker paint to be stored in the COSHH storage area. • Empty line marker paints to be disposed of in the empty line marker paint can in the general waste bin – ONLY IF EMPTY. • Do not enter the swing radius of an excavator. Adhere to exclusion zones. • Operatives using the cobra reel/rods must wear eye protection & gloves at all times whilst undertaking the operation. • Flashing safety lights on site can interfere with levels, necessitating the removal of machinery or turning off rotating orange lights while the	2	1	2

							plant is in the vicinity. Risk migrates to plant/ pedestrian interface: engineer/ site foreman must authorise lights off, arrange work to minimise time this is necessary and arrange banking vehicles if required.			
COSHH Chemical injury, skin irritants, burns, blindness, death	Y	Y	N	3	2	6	• Refer to COSHH Assessment for all hazardous substances to be used and briefed to all operatives prior to commencing work. • COSHH data sheets provided when COSHH products are issued from stores • Full PPE to be worn in conjunction with COSHH assessments • All hazardous substances must be stored on the COSHH storage cage provided.	3	1	3
Work near asbestos inhalation of respirable fibres leading to mesothelioma, lung cancer	Y	Y	N	3	3	9	**NOTE: there is no known safe level of exposure to asbestos.** • Additional MS from a specialist licensed contractor who will be in attendance for monitoring and for emergencies if bulk asbestos is uncovered. • Background air monitoring must have taken place to give a baseline, which must be a measured figure below clearance level or undetectable. • Continuous monitoring during operations with analysis continuous from on-site facility. Personal dosimeters for all personnel involved. Again with analysis in real time. • Prevention of dust raised by damping down, minimising drop distances, avoiding double handling, prompt removal from site, stockpiles only if absolutely necessary and covering on the impervious membrane. • Licensed contractor operative I place in case of bulk asbestos found- then stop work, re-assess and treat as licensed work, with full facility for this already on site.	3	1	3
Hand laying tarmac Burns from contact with hot tarmac- delivered at 170°. Irritant or contact dermatitis	Y	N	N	3	2	6	• Heat resistant gauntlets to be worn. • Body covered up against splash. • Placing at a minimal drop distance from the dumper skip. • Tools kept clean- Farvis tool heater used- no open fire or use of diesel. • COSHH assessment in place	3	1	3
Fire	Y	Y	Y	3	3	9	• All fuels must be kept in the correct type of container that is clearly identified and labelled. • No refuelling to take place in the vicinity of forms of ignition. • Engines must be switched off. • Do not improvise for containers or funnels. • Check you are using the correct fuel. • No smoking/no naked flames. Signs to display. • All Hazardous Substances must be stored on the COSHH storage. • Any cutting metal welding involving sparks or naked flame must be controlled with a Hot Work Permit	3	1	3
Silt Management. Silt gets into the water courses and contaminates the water system, damaging the environment on the waterways/ risk to aquatic life.	N	N	Y	2	3	6	• The placement of gulley protection (specially designed gulley guard, or standard protection - straw and terram) in all gullies during construction, which are to be inspected and replaced/cleaned when necessary. • The placement of a terram layer within all manholes during construction and to be inspected and replaced when necessary. • Minimising the movement of the plant on and off roads to prevent the tracking of excess soil onto roads and highways. • The installation of hardstanding areas to the front of all plots to enable 'clean' forklift access. • The placement of hardstanding or topsoil at the earliest opportunity to control surface runoff from completed areas. • Avoidance of tracking on areas of permeable paving once installed and otherwise maintaining paving areas. • Stripping topsoil must be done in stages to maintain as much vegetation cover across the site as possible. • Retention of vegetation as far as reasonably practicable along western and south-western boundaries to promote infiltration of any surface	2	1	2

							water and silt run-off. • Temporary infiltration ditches will be installed at three different locations, as shown in Drawing "SA00409-3551-C-SW-GA Surface Water Management Plan." The good infiltration rate will prevent any flooding outside the ditches, both inside and outside of the site. • The ditches will be installed before the start of the construction works, after the demolition and site clearance. They will be approximately 500mm deep, 1m wide and with 1 in 4 side slopes. • Haybale and silt matting are going to be installed inside the ditches at approximately 25m spacing for water cleaning purposes. • Haybale and matting will be changed monthly. • The placement of gulley protection (specially designed gulley guards or standard protection - straw and terram) in all gullies during construction, which are to be inspected and replaced/cleaned when necessary. • Minimising the movement of the plant on and off roads to prevent the tracking of excess soil onto roads and highways. • The installation of hardstanding areas to the front of all plots to enable 'clean' forklift access. • The placement of hardstanding or topsoil at the earliest opportunity to control surface runoff from completed areas. • Avoid tracking on permeable paving areas once installed and otherwise maintaining paving areas. aul road preferably be topped with tarmac, easy to clean with a road sweeper. • A jet wash will be installed at the site's exit to clean the wheels of vehicles leaving the site. • The designated car park will be topped with stone and be maintained mud-free.			
H&Co's Contracts Manager and Site Manager to ensure suitable first aid arrangements are available on-site at all times & compliance with the above document.										

B 25.0	HAND ARM VIBRATION & DECIBEL LEVEL REFERENCE CHART					
	Equipment/Plant	**m/s²**	**Time to reach EAV 2.5m/s² (Daily Exposure Action Value)**	**Time to reach EVL 5m/s² (Daily Exposure Limit Value)**	**Sound levels**	**HSE Points (per 15/60 mins)**
	Hilti DD130	2.2m/s²	10hr 20mins	24hr mins	80dB(A)	2.2/10
	Hilti TE 1000	6.5m/s2	1hr 11mins	4hr 44mins	87dB(A)	21 / 85
	Hilti TE 700 AVR	6.6m/s2	1hr 09mins	4hr 35mins	86dB(A)	22 / 87
	Hilti AG230-S	8.7m/s²	3hr 08mins	12hr 34mins	89dB(A)	8 / 32
	Atlas Copco 09 PE (Ver)	3.8ms2	3hr 28mins	13hr 51mins		7 / 29
	SK12 Med Breaker	4.2m/s²	2hr 55mins	10hr mins	108dB(A)	25/100
	Atlas Copco 230 PE	4.2m/s2	2hr 50mins	11hr 20mins		9 / 35
	Tex 150PE Breaker	4.5m/s²	2hr 28mins	9hr 53mins	90dB(A)	10 / 41
	Atlas Copco LT5005	6.4m/s	1hr 13mins	4hr 53mins	106dB(A)	20 / 82
	Vibrating Poker	4m/s²	3hr 08mins	12hr 30mins	85dB(A)	8 / 32
	Wacker Plate Belle 320-574mmx320mm	2.42m/s	8hr 32 mins	>24hr	101dB(A)	3 / 12
	Wacker Plate13/40Belle 720mmx400mm	3.20m/s	4hr 53 mins	19hr 32 mins	105dB(a)	5 / 20
	Wacker Plate Belle 320-720mmx320mm	4.43m/s	2hr 33 mins	10hr 11 mins	105dB(A)	10 / 39
	MBW Plate Compactor GBX Series 3550	4.5m/s	2hr 28mins	9hr 53mins		
	Plate compactor	5.18m/s²	1hr 52mins	7hr 27mins	93dB(A)	13.4/54

	LF75 Vibration Plate	6m/s2	1hr 23mins	5hr 33mins		18/72
	Wacker Plate Bomag/1845	7.3m/s	0hr 56min	3hr 45mins	89dB(A)	27 / 107
	Skill saw 5903R	3.0m/s^2	5hr 33mins	22hr 13mins	95dB(A)	4.5/18
	Airsaw Toku 9''	3.6m/s	3hr 51min	15hr 26 min	82Db(A)	35
	Petrol Saw Stihl/TS410	3.9m/s	3hr 17 mins	13hr 9 mins	98dB(A)	8 / 30
	Petrol Saw Stihl/TS420	3.9m/s	3hr 17 mins	13hr 9mins	98Db(A)	8 / 30
	Petrol Saw Stihl/TS800	Left/6.5 Right3.9m/s			116dB(A)	
	Cut-off Saw Stihls	3.90m/s^2	3hr 17mins	13hr 09mins	98dB(A)	7.5/30
	Bosch Angle Grinder GWS 7-115	6.5m/s	1hr 11 mins	4hr 44 mins	91dB(A)	
	Hilti DD130	2.2m/s^2	10hr 20mins	24hr mins	80dB(A)	2.2/10
	Hilti TE 800 AVR	9m/s^2	3hr 0mins	12hr 0mins	87dB(A)	8/32
	Stirrer Drill / Paddle Mixer	3.5m/s2	4hr 5mins	16hr 20min	87dB(A)	6 / 25
	Ausa 3t Dumper	m/s^2	hr mins	hr mins	101dB(A)	
	Thwaites 9t FTD	m/s^2	hr mins	hr mins	103dB(A)	
	Takeuchi 1.5t	m/s^2	hr mins	hr mins	93dB(A)	
	JCB 4.5t	m/s^2	hr mins	hr mins	94dB(A)	70(dBA) cab
	JCB 13t	m/s^2	hr mins	hr mins	101dB(A)	70(dBA) cab
	Doosan 14t	m/s2	hr mins	hr mins	101dB(A)	70(dBA) cab
	Doosan 22.5t	m/s2	hr mins	hr mins	105dB(A)	70(dBA) cab

	JCB 22t	m/s²	hr mins	hr mins	105dB(A)	70(dBA) cab
	Bomag 135 AD	2.5m/s	8hr	>24hr	106dB(A)	
	Rammax	Remote control	hr mins	hr mins	109dB(A)	
	Bosch Angle Grinder GWS 7-115	6.5m/s	1hr 11 mins	4hr 44 mins	91dB(A)	
	Pramac 10KVA	m/s²	hr mins	hr mins	70dB(A)	@ 7 mts
	Soil-Mech 4 piling rig	m/s2	hr mins	hr mins	103dB(A)	
	SP11 screed pump	m/s2	hr mins	hr mins	79dB(A)	

26.0	COMMUNICATIONS	
26.1	TO WHOM THE INFORMATION / WILL BE COMMUNICATED AND HOW? (TO INCLUDE NON ENGLISH SPEAKING OPERATIVES):	All persons involved in the operation
26.2	CONFIRMATION OF OPERATIVES BRIEFING: M0612 – MS – 2403 - Highway Work	

I have been briefed on the requirements of, and the risks involved with, the operation detailed above and fully understand the contents and implications. I was given the opportunity to discuss any points which I did not understand or that I felt were important in the interests of the health, safety or welfare of myself or others.

NAME:	SIGNATURE:	DATE: