



CONSTRUCTION METHOD STATEMENT

Beech Drive

Thornton

Revision	Comment	Initials	Date
Rev A	First Issue	JS	09.03.23
Rev B	MANAGEMENT OF SURFACE WATER ON SITE DURING CONSTRUCTION	JS	17.01.24
Rev C	Piling Details added	JS	13.02.24
Rev D	Burning Details added	JO	15.03.24
Rev E	Addressing LLFA comments	JO	09.04.24
Rev F	Addressing LLFA comments	JO	22.04.24
Rev G	Addressing LLFA comments 10/05/24	JO	22.05.24
Rev H	Piling Details Amended	JO	20.06.24
Rev I	Amendments to Piling Details & Vibration Calcs	JO	12.09.24

CONTENTS

- 1.0 Introduction
- 2.0 Site Working Hours, Parking, and Visitors
- 3.0 Loading & Unloading Plant & Materials
- 4.0 Erection & Maintenance of Security Hoarding
- 5.0 Control Measures for Dust & Dirt on Site (including wheel wash facilities, noise, and piling)
- 6.0 Recycling Waste from Construction Works
- 7.0 Management of Surface Water during Construction
- 8.0 Natural Environment – Ecology & Tree Protection
- 9.0 Implementation of the Construction Method Statement
- App A Traffic Management Plan
- App B Construction Traffic and Delivery Route (including on-route waiting areas)

1.0 INTRODUCTION

This Construction Method Statement has been prepared to comply with Planning Condition no. 17 of Planning Permission ref: 20/00511/FUL for the development Beech Drive, Thornton.

As required by Planning Condition 17, it provides a construction method statement which will be adhered to throughout the construction period in respect of:

- *Site Working Hours*
- *The parking of vehicles of site operatives and visitors*
- *Storage of plant and materials used in constructing the development*
- *Loading and unloading of plant and materials*
- *The erection and maintenance of security hoarding including decorative displays and facilities for public viewing, where appropriate*
- *Measures to control the emission of dust and dirt during construction*
- *A scheme for recycling/disposing of waste resulting from demolition and construction works*

The objective of this Method Statement is to specify the requirements and objectives concerning the method of site operation which shall be adhered to always during the fulfilment of the Project. It will be used:

- As a checklist for Site Management during the running of the Site to provide acceptable Site presentation
- To provide an introduction for Site Management, Sales Advisers and Sub-contractors as to how the development shall be organised and managed
- To ensure that all relevant site procedures adhered to always

2.0 SITE WORKING HOURS

Construction Hours Monday to Friday 8.00am – 6.00pm/ Saturday 9.00am – 1.00pm

No Construction work on Sundays or Bank Holidays

Site Opening Times Monday to Friday 7.30am – 6.00pm/ Saturday 8.30am – 1.30pm

Not open on Sundays or Bank Holidays

2.1 PARKING OF VEHICLES OF SITE OPERATIVES AND VISITORS

The Site Compound will be located as shown on the Traffic Management Plan (see Appendix A).

This will consist of a Site Office, meeting room, canteen, drying room and toilets.

Site Operatives:

- Car parking for site personnel will be restricted to a parking area adjacent to the compound, or as directed by Cora's Site Manager. The parking area will be in an area so that it does not conflict with other construction activities within the site.
- Access to the construction site by visitors will be strictly controlled and overseen by the Site Manager.
- Any visitors to the construction area will always be accompanied by the site manager as noted above.
- All site personnel will be instructed regarding access and specified restrictions and any visitors shall be asked to report to the Site Manager upon arrival. A notice board will be erected at the site entrance and will include details for the appointed site/project manager.

3.0 LOADING AND UNLOADING OF PLANT AND MATERIALS AND STORAGE ON SITE

Deliveries to site will be restricted between the hours of 9.15am-3.15am (Mon to Fri) , 9.00am-1.00pm (Saturday) , a 'just in time' approach will be adopted for the delivery of plant and materials to ensure that there is no unnecessary storage on site. Again, no working on Sundays, Bank or Public holidays.

Care should be taken to ensure that materials are called off and delivered to coincide with the relevant stage of construction. They should be tidily stacked in the designated area.

The appointed Site Manager shall be responsible for the unloading, checking, protecting and handling of all Cora materials delivered to site are checked on arrival to site and that the necessary recording is carried out.

The Site Manager shall ensure that materials are unloaded and loaded within designated areas, or within the specific dwelling plot they are intended for should materials be needed immediately – and that the materials are properly protected and secure.

- Bricks, blocks, tiles and lintels shall be offloaded and stacked in neat piles above ground level on pallets on levelled ground and covered. They shall be positioned off the main estate roads and footpaths and either adjacent to the appropriate Plots or in the front gardens
- Trusses, when delivered these shall be unloaded directly into position. Where this is not possible, they should be stored in accordance with the Supplier's recommendations adjacent to the property in a properly constructed rack attached to the scaffolding

- All other timber and joinery materials including stairs, flooring, second fix and insulation is to be stored under cover, or within the dwelling
- Plasterboard delivered to site shall be loaded into the unit within 24 hours
- Kitchen units, Kitchen equipment and sanitary ware shall only be stored in specifically provided secure and watertight containers on site or within a weather-tight and lockable dwelling
- Roof and vertical tiles are to be offloaded onto the front gardens of the individual Plots and stacked in a neat and tidy manner and are to be loaded onto the roof for which they are intended within 48 hours of delivery
- Bulk storage of topsoil shall be restricted to rear gardens as agreed with the Building and Project Managers. Sufficient topsoil shall be retained on each plot to allow the front of each unit to be finished and graded following completion of superstructure works

Signage will be placed in appropriate locations on the surrounding roads leading to the site to direct construction traffic.

All contractors and sub-contractors will be instructed of the route to follow to access the site before delivery of materials are made. Offloading and loading of materials will be undertaken within the permitted working hours, as set out above, unless otherwise agreed in writing with the Local Planning Authority. Please see Appendix B for Construction Traffic and Delivery Route

4.0 ERECTION AND MAINTENANCE OF SECURITY HOARDING, INCLUDING DECORATIVE DISPLAYS AND FACILITIES FOR PUBLIC VIEWING, WHERE APPROPRIATE

Specified boundary, screening and tree protection fencing will be erected upon commencement on site as required.

All site boundary fencing is to be erected immediately to the areas shown on the Site Layout.

Cora Boards and Flagpoles will be erected in positions TBC.

Cora Boards and signage will be used to direct visitors directly to the sales complex and the visitor's car park.

5.0 MEASURES TO CONTROL THE EMISSION OF DUST AND DIRT DURING CONSTRUCTION

The Site Manager will always maintain a high standard of presentation, cleanliness and general tidiness throughout the Site. As part of this, the following general control measures will be adhered to throughout the construction process:

- Weather reports will be monitored to ensure appropriate dust suppression or road cleaning is available when required.
- Sweepers to be employed to clean site roads weekly (or when operations dictate) and any large debris to be cleared immediately by a labourer.
- Only designated routes are to be used by construction vehicles and site directions to be provided to supplier and sub-contractor vehicles upon arrival to site. See appended plan.
- Easily cleaned hard standing areas to be provided for vehicles entering and exiting the site.
- Haul roads and hard standing to be maintained by regular brushing and water spraying daily or when operations dictate.
- All vehicles carrying soil and other dusty materials to be fully sheeted before entering and leaving the site.
- Enforce site speed limits to 5 Mph.
- The Site Manager will be responsible for ensuring that each trade leaves units under construction clean and tidy at the end of each working day and should include the

restacking and protection of materials within the designated areas.

WHEEL WASHING

To minimise the deposits of mud and debris on to the highway, we will be installing a wheel wash area near the site compound entrance which will be in the form of a jet wash together with brush. We will also be employing a road sweep facility (when necessary) for cleanliness and safety of the main roads within the development and off-site Highway along Beech Drive. Wheel Washing will be used during construction times, Monday to Friday 8.00am – 6.00pm/Saturday 9.00am – 1.00pm. Wheel Washing position details on the Traffic Management Plan.

SMOKE PREVENTION / BURNING OF WASTE

It is strictly against Cora policy to burn any waste on-site during the construction phase of the development. Any event where the burning of construction material takes place will be investigated by the construction/site team and dealt with accordingly.

NOISE

Noise will be kept to a minimum during the construction working hours, however there may be times when heavy machinery is used to carry out abnormal works. We will be in contact with the local residents/businesses and will offer an open-door policy should any complaints be raised.

Noise and vibration will be kept to a minimum by methods of work that we will endeavour to conform where required with the 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' (See BS 5228 Parts 2 and 4, and EC and UK Noise Legislation, as applicable).

PILING TECHNIQUES

BS5228: 2009+A1: 2014 and The London Authorities Noise Action Forum (LANAF) will be used to develop the controls required for this site. As a result, vibration levels of 1mm/s will be aimed for throughout the piling works and there will be a limit of 3mm/s for the site. See Appendices C-E for details of maximum vibration levels proposed onsite based on BS5228 and CIRIA 142, using the proposed rig – JCB JX Piling Rig.

To minimise disruption, working hours for piling will be limited to 8am-4:30pm (Monday – Friday).

Prior to any works, a letter drop will be carried out to existing properties on Beech Drive and Main Street, Thornton. This will advise of the works being carried out, the anticipated duration of the works and that the form of piling chosen is the quickest and least disruptive to the local neighbourhood.

During the works, a full-time vibration monitoring with an alarm system set to the limit of 3mm/s will be employed. If this limit is exceeded, works should cease until further control measures are employed. These could include one or more of the below:

- Pre-boring of the pile location
- Utilising open-ended driven tubular steel piles
- Deep slip trench dug and barriered between the edge of the plot-specific working platform and the outside edge of the easement zone.

6.0 A SCHEME FOR RECYCLING/DISPOSING OF WASTE RESULTING FROM DEMOLITION AND CONSTRUCTION WORKS

A waste segregation policy will be adhered to separate recyclable and non-recyclable waste.

Rubbish skips shall be provided to maintain the site in a neat and tidy state. When full, they shall be removed and replaced with empty skips.

Wherever possible, full skips to be removed at the end of the working week and redelivered on Mondays. If this is not possible then partly full skips to be covered and secured with tarpaulin.

Rubbish skips shall be positioned to meet the following objectives: -

- Be located away from the View Home and Visitor's car parking area
- Be available on dismantling of scaffolding for each unit, for the immediate removal of builder's debris
- Be available on completion of dry lining for recycle purposes
- Be available for completion of second fix trades, at which time the units will be thoroughly cleaned, with all builder's debris removed prior to decoration commencing

7.0 MANAGEMENT OF SURFACE WATER ON SITE DURING CONSTRUCTION (in line with BS8582:2003 – Code of Practice for Surface Water Management for Development Sites)

It is likely that during periods of heavy or prolonged rainfall natural run off will follow the topography of the land.

To deal with the surface water runoff from the construction site, the drainage and road network will be the first site operation to take place. This will ensure that the foul & surface water drainage network is provided to the proposed outfall/s and surface water drains appropriately into the relevant SuDS components and drainage network. This will ensure that once each property is constructed and connected to the drainage system, the associated surface water can discharge into the new network thus reducing surface water on the site. The SuDS systems and below mitigation has been designed with the silt laden surface water runoff in mind, so that the silt does not clog the infiltration systems or build up in storage systems leading to potential pollution of nearby waters. The proposed drainage networks also benefit from STW technical approval and will be adopted by them post-construction. As part of the adoption process, STW require networks to be fully jetted and cleaned as well as undergoing CCTV surveys to ensure they are clear and in good working order. This occurs immediately post construction and allows them to be placed onto a 12-month maintenance period, ensuring they are working to full intended capacity.

Please also see Report ADC1092-RP-P (Surface Water Drainage Strategy Report) for further details.

Measures will be taken to ensure that no contaminated surface water or other liquids or solids, which could cause harm to the environment, are deposited onto the land or enabled to pass over the land. During construction the implementation of a slip trench will be used to capture and filter water to remove solids that may arise through the build phase. This is an approved method of surface water management to be used as per section 23. This will be managed by the site manager and will be replaced when required and disposed of.

Moreover, to ensure surface water runoff replicates existing site conditions the following measures will be implemented:

- Soil should not be stripped up to the edge of any watercourse, stream, or drainage ditch to prevent loose soil and silt being washed into the watercourse. This will prevent silt-up and pollution of downstream watercourses.
- Vegetation and topsoil should be stripped in sequence, only clearing the areas that are to be worked in the short term. This will minimise the amount of exposed ground and stockpiles of soil on the site. This in turn will reduce the quantity of silty water to deal with.

Additional mitigation (not applicable to stockpiles built and removed within 24 hours):

- Soil stockpiles must be located at minimum 10 metres from any ditch, stream, swale water conveyance system, pond etc. This buffer zone measurement is from the edge of the protected area nearest the stockpile, to the outer edge of the stockpile.
- Stockpiles not to be located within designated floodways or overland flow paths.
- The natural angle of repose of the piled soil material is to be designed into the height and slope of the stockpile, preventing potential sloughing of the slope.
- The stockpile should not be built within the drip line, or over the root crown of adjacent trees.

In the event of a Met Office Warning or where emergency/additional measures of management are required, please see the following actions.

Yellow Warning:

- The weather forecast will be monitored daily using a 5-day weather look ahead to plan site activities.
- Watercourses and drains to be inspected visually by the site supervisor daily and/or during any operation which could affect the watercourse/sewer network. Where required, briefings should be provided to site operatives.
- Surface water run-off from each stockpile to be monitored daily. Additional straw bales to be provided at the base of the stockpiles should the level of surface water run-off be deemed a risk to sensitive receptors.
- The level of surface water present in excavations should be monitored daily. Additional straw bales to be provided at the base of excavations if the level of surface water run-off is deemed a risk to sensitive receptors.
- Where necessary, a suitably sized bung or flow reducing plate to be fitted within the outlet headwalls of attenuation ponds in order to prevent the flow of water with an unacceptably high level of suspended solids into the system. The silted water should then be retained within the attenuation basin until the silt settles acceptably. At this point the additional bung/flow restrictor can be removed for water to discharge as normal.
- Straw bales and suitably sized bungs/flow reducing plates should be readily available on-site to promptly implement measures where necessary.
- If the decision is made that a spillage/silt incident is larger than can be controlled using the provisions for spill containment, the appointed Cora Homes staff member should be contacted for advice and where necessary the appropriate environmental consultant will be contacted in to enable the appropriate control response.
- Where necessary, use of ground protection mats to prevent vehicles churning up the ground and creating trenches where rainwater might pool and stagnate.
- Move any chemicals that could be contaminated by surface water flooding to a safe and dry area.

Amber Warning:

- Actions to be taken as above.
- Minimise vehicle use/access on site if necessary.
- Should site flooding seem imminent, shut off electrical supply and, if safe to do so, turn off the gas supply. Move vehicles and generators to higher ground if possible.

Red Warning

- Actions to be taken as above.
- Works to cease if extreme weather occurs, including activities which may enhance surface water run-off. This will reduce the potential for a pollution incident to occur as well as potential health and safety risks to staff.

The appointed site manager will be responsible for ensuring the Construction Method Statement and actions relating to surface water management are adhered to during construction. The site manager will also be signed up to receive Met Office weather warnings so that the appropriate actions as above can be taken. The lead contact for this will be the Construction Director who will oversee the Site Manager. Contact details at the base of this document to be redacted for public view.

8.0 NATURAL ENVIRONMENT – ECOLOGY & TREE PROTECTION

As part of the site management responsibilities, the site manager will undertake daily site walks which will include the inspection of existing trees, hedges, perimeter boundaries, existing watercourses etc to ensure that no damage has occurred during site activities.

In the unlikely event that it does, the item/s will be reported immediately to the Cora Management Team, the relevant issues logged, and immediate action taken.

The site will also adhere to the full recommendations of the relevant ecological and biodiversity reports contacting the relevant author/s if any clarification or further advice is required.

9.0 IMPLEMENTATION OF THE CONSTRUCTION METHOD STATEMENT

Cora's appointed Site Manager will be responsible for the implementation and monitoring of this Construction Environment and Traffic Management Plan for the duration of the contract.

The Site Manager will convene a Co-ordination meeting with all Service Authorities to discuss Programme, Health and Safety and Site Tidiness requirements and all contractors and sub-contractors will be given instructions upon appointment, which will include a copy of the Construction Environment and Traffic Management Plan.

Any issues that are highlighted will be reported at a monthly site meeting that will be attended by Cora's Site Manager and representatives of all contractors, sub-contractors and the supply and service companies will be invited to attend as require Preliminary site preparation works required to be carried out on mobilisation on site shall be completed as soon as possible.

10.0 SURFACE WATER MAINTENANCE PLAN

The piped surface water drainage system beneath the adopted road will be offered to Severn Trent Water Ltd for adoption under a s104 agreement. The s104 will exclude the proposed retention basin (an online attenuation feature), which is to be maintained by a Management Company.

Inspection of drainage elements will be required regularly in order to assess their performance and to schedule any required maintenance and will consist of routine inspections and engineering inspections. Routine inspections will assess the need for maintenance and note concerns with functionality of the drainage system. Engineering inspections will assess engineering aspects of the drainage network which are not likely to be picked up during routine inspections, including concrete deterioration and pipe blockages.

Maintenance Schedules

For the detention basin (to be maintained by the Management Company), the following maintenance schedule will be delivered as per the Surface Water Drainage Strategy Report.

Operation and maintenance requirements for detention basins		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin.	Half yearly (spring before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets, and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool –where provided	Annually (as set out in CIRIA SuDs guidance)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim ant trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial action	Repair erosion or other damage by reseedling or re-turfing	As required
	Realignment of riprap	As required
	Repair/ rehabilitation of inlets, outlets, and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required
source: CIRIA SuDs Manual (C753) (2015) Part D. Chapter 22, pg. 483		

For the flow control device (to be maintained by the Management Company), the following maintenance programme will be delivered as per the Surface Water Drainage Strategy Report.

Drainage Component	Maintenance Task	Frequency
Drainage Network	Inspect for blockages to ensure network is free running	Every 3 months and after any significant storm event
Surface water gullies/ Linear drainage features	Inspect for blockages and ensure that the drainage feature is free running Jet or vacuum as appropriate	Every 3 months and after any significant storm event
Catchpits	Inspect for and remove silt	Every 6 months and after any significant storm event
Discharge Control	Inspect for blockage and correct operation	Every 3 months and after any significant storm event
source: CIRIA SuDs Manual (C753) (2015) Part D. Chapter 28		

For the outfall pipe and drainage ditch (to be maintained by the Management Company), the following maintenance programme will be delivered as per the Surface Water Drainage Strategy Report.

Drainage Component	Maintenance Task	Frequency
Outfall pipe	Regular maintenance and monitoring to ensure sufficient operation.	Annually or as required
Drainage ditch	Monitoring of watercourse levels	Frequently post development then as required/after any storm event
source: CIRIA SuDs Manual (C753) (2015) Part D. Chapter 28		

Where sediment build up is removed as part of the above processes, care will be taken in order to not remobilise these and flush them into the watercourse.

Contact Details:

Steve Keenan – Construction Director

Steve.Keenan@cora.uk

Grovelands Business Park
West Hadden Rd
East Haddon
Northamptonshire
NN6 8FB
Tel: 01604 369200

Appendix A

Traffic Management Plan

Measures to Control Dust and Dirt during Construction:

The Site Manager will always maintain a high standard of presentation, cleanliness and general tidiness throughout the Site. As part of this, the following general control measures will be adhered to throughout the construction process:

- Weather reports will be monitored to ensure appropriate dust suppression or road cleaning is available when required
- Sweepers to be employed to clean site roads weekly (or when operations dictate) and any large debris to be cleared immediately by a labourer
- Highway Roads will be monitored by the Site Manager and, when required, a Road sweeper will be deployed on Highway Roads.
- Stockpiles of materials will be damped down and suitably treated to prevent the emission of dust from materials. Stockpiles will be strategically located to minimise dust generation and kept to a minimum height where possible.
- Appropriate equipment will be fitted or used in conjunction with suitable dust suppression techniques.
- Drop heights from conveyors, loading shovels, hoppers and other equipment will be kept to a minimum wherever possible.

Only designated routes are to be used by construction vehicles and site directions to be provided to supplier and sub-contractor vehicles upon arrival to site. See appended plan.

- Easily cleaned hard standing areas to be provided for vehicles entering and exiting the site
- Haul roads and hard standing to be maintained by regular brushing and water spraying daily or when operations dictate
- Skips and all vehicles carrying soil and other dusty materials to be fully sheeted before entering and leaving the site
- Enforce site speed limits to 5 Mph

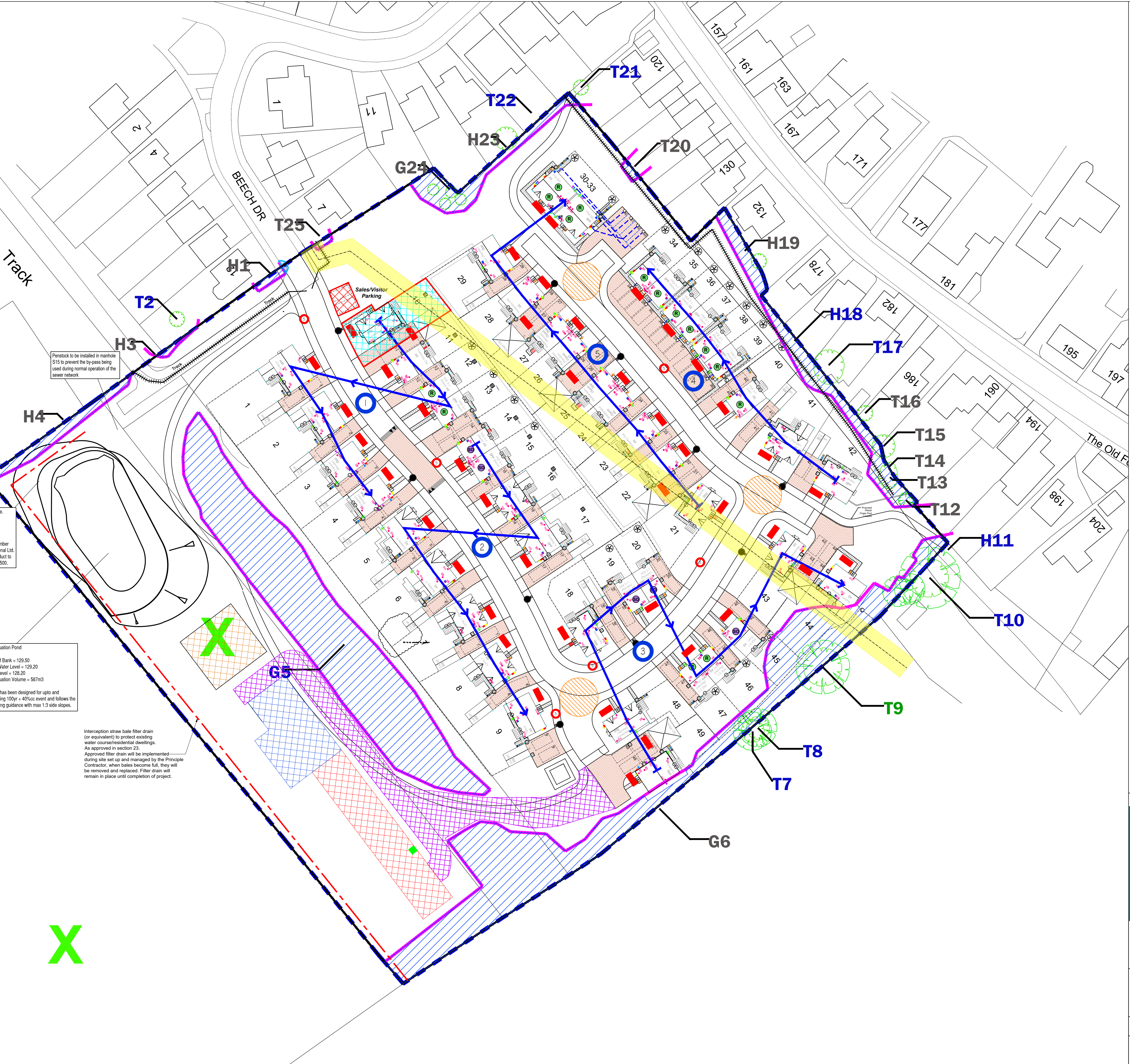
Proposed Storm water Control manhole.
Flows limited to 9.5 ltr/sec
Design head: 1.2m
Orifice size: 139mm
Technical specification of Control Chamber
has been designed by Hydro-International Ltd,
including a Hydro-Brake Optimum product to
specification: SHE-0139-9500-1200-9500.

Attenuation Pond
Top of Bank = 129.50
Top Water Level = 129.20
Bed Level = 128.20
Attenuation Volume = 587m3
Pond has been designed for upto and
including 100yr + 40%acc event and follows the
standing guidance with max 1:3 side slopes.

Interception straw bale filter drain
(or equivalent) to protect existing
water course/residential dwellings.
As approved in section 23:
Approved filter drain will be implemented
during site set up and managed by the Principle
Contractor, when bales become full, they will
be removed and replaced. Filter drain will
remain in place until completion of project.

X

X



KEY:

Traffic Management - what you need to do
The following actions will help keep pedestrians and vehicles apart:

- Entrances and exits - provide separate entry and exit gateways for pedestrians and vehicles;
- Walkways - provide firm, level, well-drained pedestrian walkways that take a direct route where possible;
- Crossings - where walkways cross roadways, provide a clearly signed and lit crossing point where drivers and pedestrians can see each other clearly;
- Visibility - make sure drivers driving out onto public roads can see both ways along the footway before they move on to it;
- Obstructions - do not block walkways so that pedestrians have to step onto the vehicle route; and
- Barriers - think about installing a barrier between the roadway and walkway.

To limit the number of vehicles on site:

- provide car and van parking for the workforce and visitors away from the work area;
- control entry to the work area; and
- plan storage areas so that delivery vehicles do not have to cross the site.

One-way systems can reduce the risk from reversing vehicles, especially in storage areas. A turning circle could be installed so that vehicles can turn without reversing.
Make sure that all drivers and pedestrians know and understand the routes and traffic rules on site. Use standard road signs where appropriate. Provide induction training for drivers, workers and visitors.

TRAFFIC MANAGEMENT KEY:

- SITE COMPOUND & WELFARE
- CAR PARK
- FIRE ASSEMBLY POINT
- EXISTING EASEMENTS/UTILITIES
- MATERIAL STORE
- TEMP HAUL ROAD
- TURNING CIRCLE (10m Diameter)
- SALES COMPLEX
- TREE/ROOT PROTECTION

TO BE UPDATED BY SITE MANAGER:

- SITE SAFETY INFORMATION BOARD
- NO ENTRY
- CROSSING POINTS
- CONSTRUCTION PEDESTRIAN ACCESS
- PUBLIC PEDESTRIAN ACCESS
- HERRAS FENCING
- DELIVERY VEHICLE UNLOAD AREA
- TWO WAY TRAFFIC FLOW
- ONE WAY TRAFFIC FLOW
- SURFACE WATER INTERCEPTION
- PROPOSED SOIL / SUBSTRATE STORAGE LOCATIONS

D	Compound position and storage amended	09.07.24
C	Soil/substrate storage locations added	22.04.24
B	Amended as per planning comments	30.11.23
A	First Issue	25.10.23

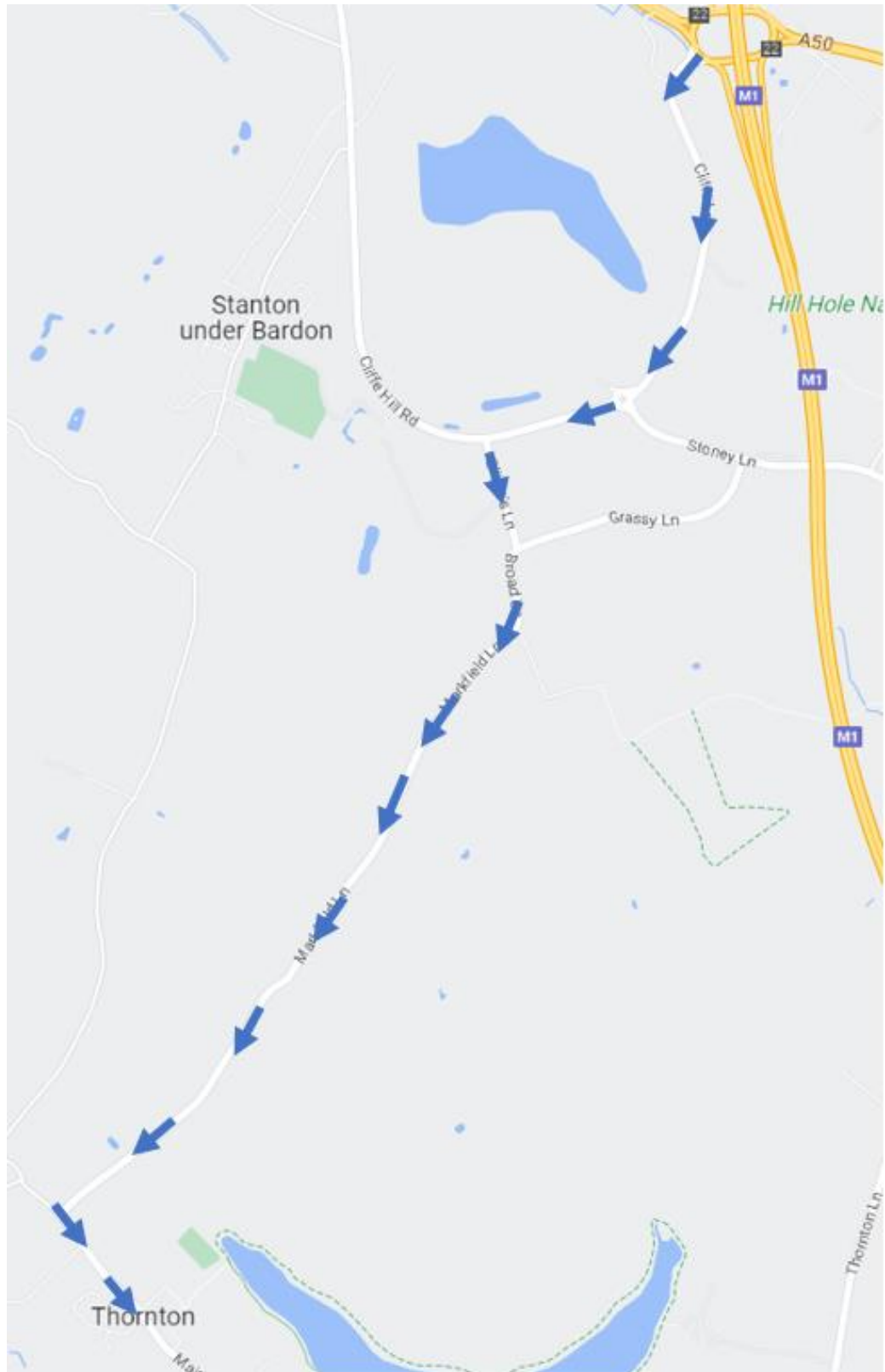
Rev.	Description	Date
 Grovelands Business Park West Haddon Road, East Haddon, Northamptonshire NN6 8FB		
Development		
Beech Drive Thornton		
Drawing Title		
Traffic Management Plan Planning		
Date	Scale	Drawn
08/11/22	1:500 @A1	JS
Dwg. Ref.	Rev.	
02419 - 004P	D	

Appendix B

Delivery Route 1

Construction Traffic and Delivery Route Plan

Page 1

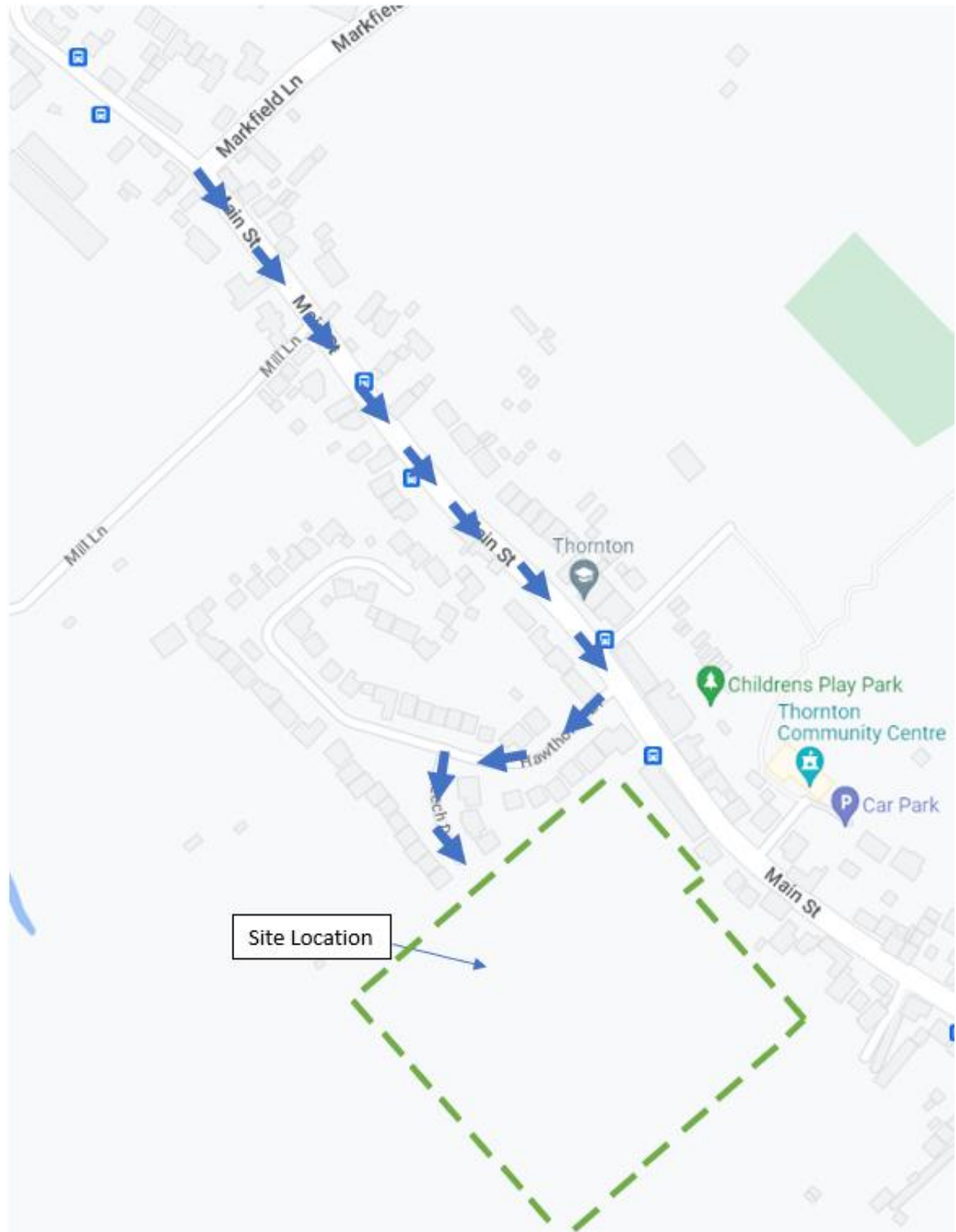


Access via Markfield Lane

Turn onto main street and follow onto Beech Drive

Construction Traffic and Delivery Route Plan

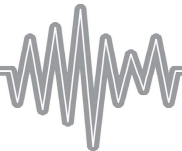
Page 2



Access via Beech Drive

Appendix C

Hammer Energy Test Report



Hammer Energy Test

Client: **Akela Ground Engineering Ltd**

Contract: **Nuneaton (23145)**

Test Date: **09/09/2024**

Pile Analysis Ref: **P2030-ET01**

Hammer Tested: **2.5 Tonne BSP JX25-8**

Report by:

G Clarke

Analyst

Dynamic Measurement and Analysis Proficiency Test: **Advanced**

Checked by:

R J Kightley

Director

Dynamic Measurement and Analysis Proficiency Test: **Master**

Date: **09/09/2024**

1. Object

To carry out a hammer energy test to a BSP JX25-8 operated by Akela Ground Engineering using a Pile Driving Analyzer with strain transducers and accelerometers recording force and velocity data.

To determine a drive system efficiency for the hammer on the BSP JX25-8.

2. Hammer Energy Test

Test Date: 09/09/2024

Contract Nuneaton (23145)

Hammer Tested: BSP JX25-8

Ram Weight: 2.5

Blow Numbers	Ram Weight (kN)	Requested Stroke (m)	Rated Energy (kN.m)	Measured Energy (kN.m)	Drive System Efficiency (%)	Blows/ Minute
14-24	24.525	0.20	5.00	5.2	104%	82.7
61-71	24.525	0.30	7.50	9.4	126%	88.9
80-90	24.525	0.40	10.00	11.4	114%	87.7

Hammer drop height was set by instrumentation from inside the piling rig.

Ram Weight (kN) calculated from Ram Mass (Tonnes) multiplied by g (9.81m/s^2).

The hammer energy test was carried out using the following equipment:

Pile Driving Analyzer: **3899L**
 Strain Transducer 1: **X810**
 Strain Transducer 2: **X811**
 Accelerometer 1: **K13100**
 Accelerometer 2: **K13095**

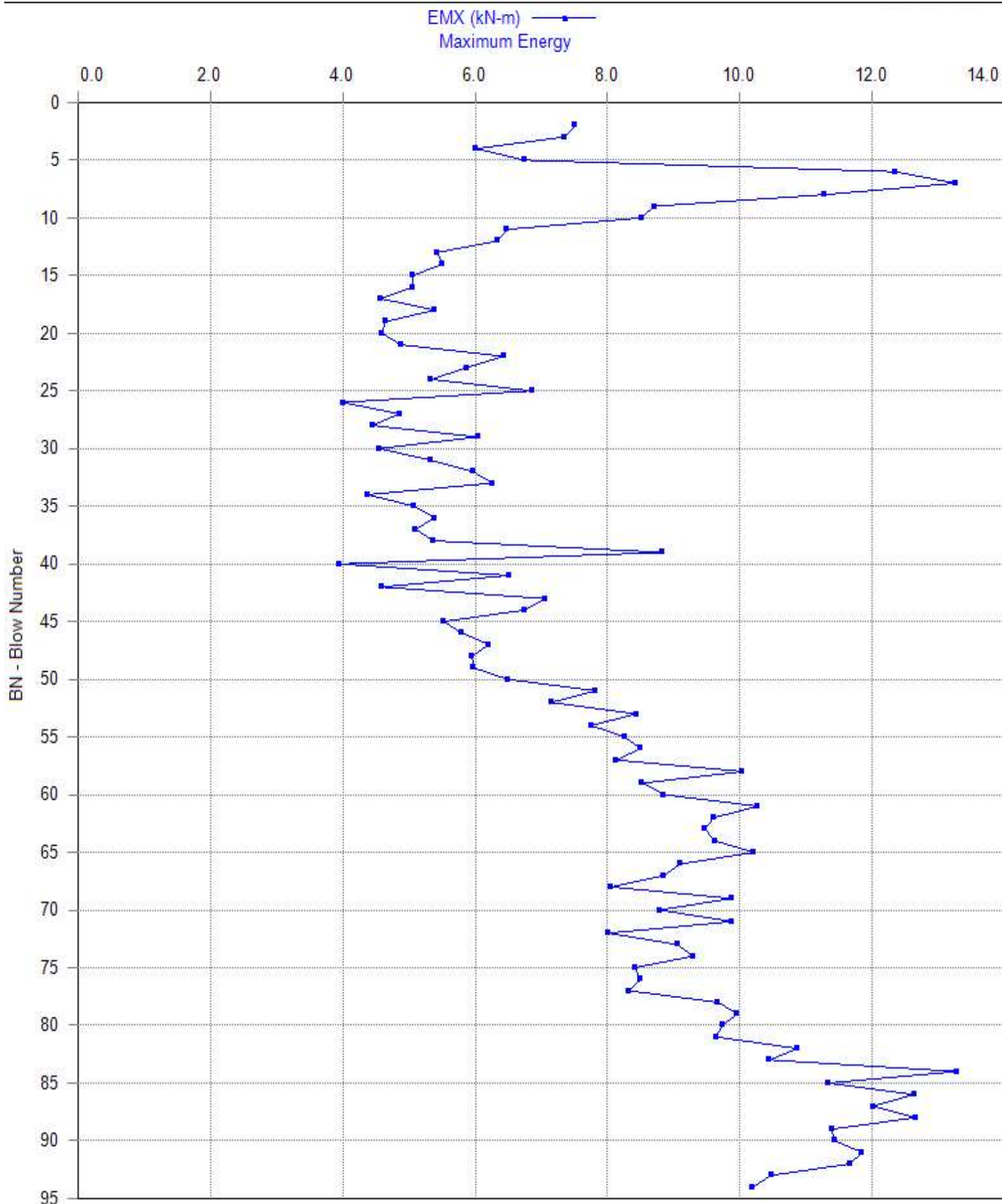
Information available at the time of test includes maximum force, velocity and energy values.

Testing was carried out with reference to ASTM D4945 Standard Test Method for High Strain Dynamic Testing of Piles.

The energy data (EMX) recorded during testing is presented in a graph and table in the following pages.



240909 NUNEATON - ENERGY TEST JX25-8





Pile Analysis Ltd

PDILOT2 2022.1.62.0

Case Method & iCAP® Results

240909 NUNEATON - ENERGY TEST JX25-8

OP: S MITCHESON

AR: 625.00cm²

LE: 6.5m

WS: 4,350.0m/s

EMX: Maximum Energy

RMX: Maximum Case Method Capacity (JC)

SFR: Skin Friction (Crude Damping Correction)

EBR: End Bearing Capacity (JC)

DFN: Final Displacement

RESTRIKE

Date: 09-September-2024

SP: 23.6kN/m³

EM: 45,466MPa

JC: 1.00

DTC: Temporary Compression

DMX: Maximum Displacement

ETR: Energy Transfer Ratio - Rated

BPM: Blows/Minute

BL#	EMX kN-m	RMX kN	SFR kN	EBR kN	DFN mm	DTC mm	DMX mm	ETR (%)	BPM bpm
2	7.5	979	271	708	1	7	8	25.5	1.9
3	7.3	990	263	727	1	7	8	25.0	50.9
4	6.0	933	206	727	1	7	7	20.4	60.7
5	6.7	972	259	713	0	7	8	22.9	83.8
6	12.3	1,082	237	845	3	8	11	42.0	80.9
7	13.3	1,101	235	866	3	8	11	45.1	82.9
8	11.3	1,105	308	797	2	8	10	38.3	87.6
9	8.7	1,045	274	771	1	8	9	29.6	92.9
10	8.5	1,040	289	751	2	7	9	28.9	85.6
11	6.5	966	215	751	1	7	8	22.0	86.4
12	6.3	955	183	772	1	7	7	21.6	82.1
13	5.4	911	154	756	0	7	7	18.5	82.6
14	5.5	914	155	759	0	7	7	18.7	78.8
15	5.1	899	113	786	0	7	7	17.2	85.3
16	5.1	890	159	731	0	7	7	17.2	84.4
17	4.6	870	89	780	0	6	6	15.5	88.1
18	5.4	914	131	784	0	7	7	18.3	79.7
19	4.6	869	110	759	0	6	6	15.8	87.7
20	4.6	862	96	767	0	6	6	15.6	89.6
21	4.9	887	92	794	0	6	7	16.6	84.9
22	6.4	958	154	804	1	7	8	21.9	73.4
23	5.9	936	141	795	0	7	7	19.9	75.7
24	5.3	912	114	798	0	7	7	18.1	82.2
25	6.9	982	184	798	1	7	8	23.3	72.7
26	4.0	825	72	753	0	6	6	13.6	96.5
27	4.9	883	98	785	0	6	7	16.5	88.7
28	4.4	856	101	755	0	6	6	15.1	93.0
29	6.0	941	143	799	0	7	7	20.5	79.1
30	4.5	866	75	791	0	6	6	15.5	89.0
31	5.3	904	112	792	0	7	7	18.1	84.1
32	6.0	940	131	810	0	7	7	20.3	76.9
33	6.3	952	153	799	1	7	8	21.3	76.3
34	4.4	851	95	756	-1	6	6	14.9	97.2
35	5.1	896	117	779	0	7	7	17.3	86.3



36	5.4	908	116	792	0	7	7	18.3	86.7
37	5.1	900	100	801	0	7	7	17.3	89.6
38	5.4	908	128	781	1	6	7	18.3	86.8
39	8.8	1,034	258	775	2	7	9	30.0	2.0
40	3.9	818	104	713	-1	6	6	13.4	83.7
41	6.5	968	173	795	0	7	8	22.1	91.3
42	4.6	862	100	762	0	6	6	15.6	87.7
43	7.1	989	201	788	1	7	8	24.0	81.9
44	6.8	977	207	770	1	7	8	23.0	75.5
45	5.5	922	136	787	0	7	7	18.8	92.4
46	5.8	932	146	786	1	7	7	19.7	94.6
47	6.2	958	135	823	1	7	8	21.1	86.1
48	6.0	940	177	764	1	7	7	20.3	97.2
49	6.0	945	123	821	0	7	7	20.3	90.9
50	6.5	964	141	823	0	7	8	22.1	92.2
51	7.8	1,019	225	794	1	7	9	26.6	89.9
52	7.2	994	184	810	1	7	8	24.3	96.4
53	8.4	1,046	233	812	1	8	9	28.7	89.7
54	7.8	1,017	180	837	1	8	8	26.4	95.3
55	8.3	1,032	215	817	1	8	9	28.1	92.4
56	8.5	1,046	244	802	1	8	9	28.9	90.6
57	8.1	1,031	232	799	1	8	9	27.7	92.8
58	10.0	1,074	330	744	2	8	10	34.1	82.9
59	8.5	1,049	224	824	1	8	9	29.0	93.7
60	8.9	1,054	227	827	1	8	9	30.1	92.9
61	10.3	1,077	299	778	2	7	10	34.9	84.6
62	9.6	1,072	287	785	2	8	9	32.6	86.5
63	9.5	1,061	255	806	2	8	10	32.2	88.4
64	9.6	1,067	251	816	2	8	10	32.7	85.5
65	10.2	1,087	327	760	2	8	10	34.7	86.1
66	9.1	1,067	251	815	2	8	9	31.0	92.8
67	8.9	1,055	173	881	2	8	9	30.1	89.8
68	8.1	1,030	156	874	1	8	9	27.4	90.9
69	9.9	1,074	317	757	2	8	10	33.6	90.6
70	8.8	1,059	281	778	1	8	9	29.9	91.5
71	9.9	1,076	261	814	2	8	10	33.6	91.3
72	8.0	1,033	115	918	1	8	9	27.2	92.7
73	9.1	1,059	204	854	2	8	9	30.8	86.5
74	9.3	1,064	236	828	2	8	9	31.6	89.3
75	8.4	1,041	135	906	1	8	9	28.6	93.7
76	8.5	1,048	227	821	1	8	9	28.9	92.1
77	8.3	1,036	158	878	1	8	9	28.3	94.0
78	9.7	1,067	267	800	2	8	10	32.9	86.1
79	10.0	1,079	327	752	2	8	10	33.9	87.8
80	9.7	1,074	314	760	2	8	10	33.1	91.3
81	9.6	1,078	321	757	1	8	10	32.8	89.6
82	10.9	1,089	345	744	2	8	10	37.0	86.4
83	10.4	1,087	360	727	2	8	10	35.5	90.0
84	13.3	1,104	385	719	4	8	12	45.2	80.9

85	11.3	1,103	369	734	2	8	11	38.6	88.8
86	12.6	1,111	375	735	3	8	11	42.9	88.9
87	12.0	1,112	378	734	3	8	11	40.8	86.7
88	12.7	1,113	399	713	3	8	11	43.0	84.4
89	11.4	1,105	380	725	2	8	11	38.7	87.1
90	11.4	1,097	347	750	2	8	11	38.9	91.0
91	11.8	1,113	374	739	3	8	11	40.3	89.2
92	11.7	1,096	357	739	3	8	11	39.7	86.3
93	10.5	1,093	270	823	2	8	10	35.6	90.2
94	10.2	1,092	319	773	2	8	10	34.7	89.6

Total number of blows analyzed: 93

Sensors

F1: [X810] 93.8 (1.00); F2: [X811] 93.4 (1.00); A1: [K13100] 436.2 (1.00);
 A2: [K13095] 406.4 (1.00)



This documents that

Richard James Kightley
Pile Analysis

has on July 3, 2024 achieved the rank of

MASTER

on the **Dynamic Measurement and Analysis Proficiency Test**

The individual identified on this document demonstrated to the degree granted above an understanding of theory, data quality evaluation, interpretation and signal matching for high strain dynamic testing of deep foundations. ***It is recommended that individuals at the Basic level seek Intermediate, Advanced, Master or Expert levels through additional study within two years of the date of this document***

The ability of the individual named to provide appropriate knowledge and advice on a specific project is not implied or warranted by the Pile Driving Contractors Association or Pile Dynamics, Inc. The Pile Driving Contractors Association or Pile Dynamics, Inc. assumes no liability for foundation testing and analysis work performed by the bearer of this certificate. This certificate can be verified at www.PDAproficiencytest.com.

Frank T. Peters, Executive Director
Pile Driving Contractors Association



Garland Likins, Senior Partner
Pile Dynamics, Inc.

No. P0105



This documents that

**Graham Clarke
Pile Analysis**

has on May 17, 2024 achieved the rank of

ADVANCED

on the **Dynamic Measurement and Analysis Proficiency Test**

The individual identified on this document demonstrated to the degree granted above an understanding of theory, data quality evaluation, interpretation and signal matching for high strain dynamic testing of deep foundations. ***It is recommended that individuals at the Basic level seek Intermediate, Advanced, Master or Expert levels through additional study within two years of the date of this document***

The ability of the individual named to provide appropriate knowledge and advice on a specific project is not implied or warranted by the Pile Driving Contractors Association or Pile Dynamics, Inc. The Pile Driving Contractors Association or Pile Dynamics, Inc. assumes no liability for foundation testing and analysis work performed by the bearer of this certificate. This certificate can be verified at www.PDAproficiencytest.com.

Frank T. Peters, Executive Director
Pile Driving Contractors Association



Garland Likins, Senior Partner
Pile Dynamics, Inc.

No. 3801

Appendix D

Vibration Calculation



Project No: 24105 - Thornton	Sheet No: 1
Prepared by: WP	Date: 10/09/2024
Checked by: DW	Date: 10/09/2024
Approved for Construction by:	Date:

TITLE **Beech Drive, Thornton, Leicestershire - Revised for JX25**

Vibration Assessment

Rig **JCB JX25**
 Hammer Weight **2.00** Tonnes
 Drop Height **0.20** m
 Hammer Efficiency **70.0** %
 Separation of pile toe and structure **21.00** m

* Although different calculation methods use different wording and notation, these values are the same as the piling system energy

Piling system energy = **280** kgm (**2746.8** j)

From BS5228-2:2009

$$V_{res} = k_p \left[\frac{\sqrt{W}}{r^{1.3}} \right]$$

where; V_{res} = resultant PPV (mm/s)
 W = hammer energy (kj)
 r = slope distance from pile toe (m)
 k_p = driving resistance factor

driving conditions characterised by **dense granular material** hence k_p is taken as **3**

Therefore projected vibration = **3.0** mm/s

From Ciria 142 (1992) (after Attewell et al (1990/1) and Oliver and Selby (1991))

$$v = b \left(\frac{\sqrt{E}}{r} \right)^x$$

where; v = peak particle velocity at r
 E = pile energy input *
 r = radial distance between source and receiver
 b = 1.33
 x = 0.73

Therefore, projected vibration = **2.6** mm/s

Summary

BS5228-2:2009 = **3.0** mm/s
 Ciria 142 (1992) = **2.6** mm/s

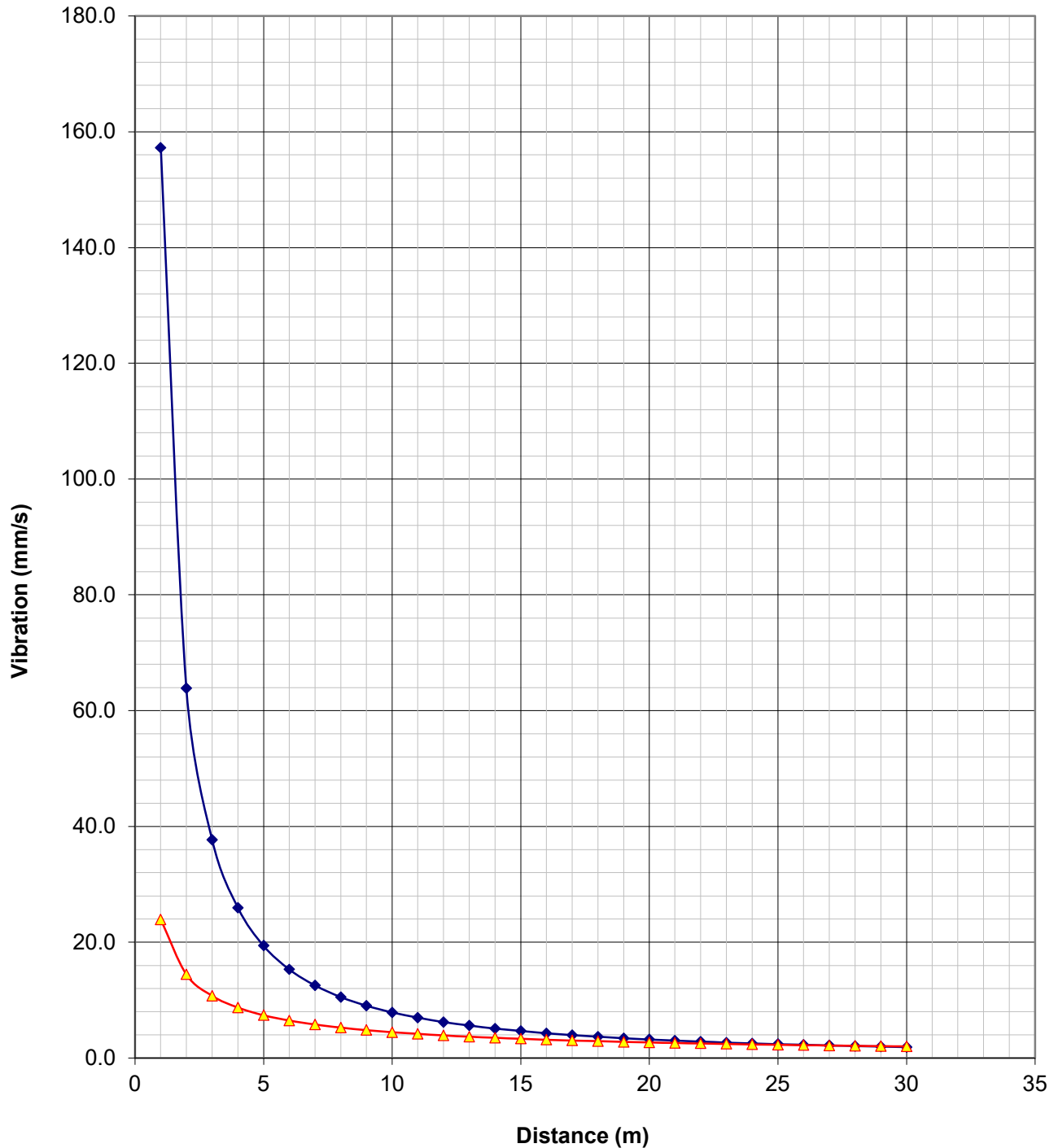
Appendix E

Vibration Graph

TITLE Beech Drive, Thornton, Leicestershire - Revised for JX25

Rig JCB JX25 System Energy 2746.80 kj

Calculated Vibration Vs. Distance from Source



—◆— Vibration (mm/s) BS5228

—■— Vibration (mm/s) BS5228

—▲— Vibration (mm/s) CIRIA 142