SEQUENCE AND TIMING OF THE PRINCIPAL PARTS OF THE WORKS

Approach to our methodology

Jackson will support Hounslow Highways in public discussions to help aid the general public's understanding of the scheme. This will help to minimise disruption and complaints. The project will be registered with the *Considerate Constructor Scheme*. We are currently achieving an average score across all five categories of 7.7, comparing favourably with the national average of 7.008.

Additionally, Jackson is a member of the *Fleet Operators Recognition Scheme* (FORS) – Silver Accredited - meaning a high level of driver awareness amongst our workforce and suppliers.

Jackson has a wealth of experience undertaking highway improvements. All of our people understand the complex documents, permits and approvals processes to be followed to enable works to commence on the ground.

Overall programme rationale

We recognise the tight programme constraints Hounslow Highways is working within for this scheme. We've therefore looked at how we will maximise efficiencies. We are working on multiple work fronts simultaneously with multiple gangs to keep the overall works duration to a minimum. Please see our programme (**16044-TP01 Option A**) for more details of our sequence of works.

Health and Safety documentation and site set up required before works commence

A Project Management Plan (PMP) will be produced which will incorporate the construction phase health and safety plan, quality plan, environmental plan and an inspection and test plan. This is more fully covered in our response to *14.Health & Safety Plan*.

The PMP will identify site specific risk assessments and method statements required.

Specific site inductions will be held for all personnel on site, and a traffic plan will be provided to show delivery routes and vehicle/plant and person segregation.

For all activities, method statements and risk assessments will be briefed out to those members of the workforce involved.

Site set-up

The shared site compound and welfare facilities will be installed on areas of vacant land nearby to site, as shown on the layout drawing (please see ***Proposed Site Setup*****,** below).

The site compound area will be secure and have 2.4m high hoarding installed around the perimeter. The worksite will be fenced off with 1.8m high double clipped HERAS fencing. Pedestrian and vehicle gates will be used for access and kept locked when not in use. Within the work areas, pedestrian barrier will be used to segregate plant and people movements.

Site accommodation will include a canteen, changing/ drying room, male and female toilets and a shower. Site welfare and office will be maintained and regularly cleaned to ensure the health of site personnel.

The site will be subject to monthly Health, Safety and Environmental inspections by Jackson's QSE Manager Charles McKinley-Rowe and weekly internal site evaluations by either the Project Manager or General Foreman. Jackson will invite Hounslow Highways to undertake joint site inspections.

HOUNSLOW ROAD

Preconstruction work activities

- Place orders with key sub-contractors (piling and pre-cast concrete)
- Manufacture of precast elements, and procurement of sheet piles
- Temporary works design and checks for piling platforms, crane mats, scaffolding, formwork and excavation support
- Design and approval of traffic management proposals
- Production and approval of the PMP.

Construction Phase

- Following completion of the above, and after the Christmas traffic management embargo, we will set up the site compound as described in the tender documents
- Install a road closure/diversionary route and set up boundary fencing/hording
- Carry out site clearance
- **Works to north of bridge:**
    - Excavation to underside of ties. This will require support of the existing services until they are diverted
    - Construction of piling platform to provide a safe and stable working area for the leader rig and attendant crane. **Please see *Sketch 01*** below for details. As detailed on the sketch, this requires a wider works area than currently ***indicated on drawing FTC1-100-2-01***. We have looked at alternatives but cannot find a safe, practical solution which requires less working room
    - Pre-auger the two inner lines of piles using a leader rig
    - Install two inner lines of piles using a leader rig. This will be fed by an attendant crane located on the line of the road
    - Installation of wailings and ties by a specialist sub-contractor
    - Alter piling platform to allow access for piling rig to lower, outer lines of piles (**please see *Sketch 01***)
    - Pre-auger the two outer lines of piles with the leader rig
    - Install two outer lines of piles using a leader rig. This will be fed by an attendant crane located on the line of the road
    - On completing the wailing and tie installation, the section between the inner two rows of piles will be filled to underside of capping beam. This work will be carried out concurrently with the alterations to the piling platform
    - On completion of the piling works, capping beam construction will commence. This will be carried out on two work fronts to minimise the duration of this time consuming operation
    - The construction of the ramps will follow on from the completion of the capping beams to the outer pile lines
    - The brick facing to all the retaining walls will take place on multiple work fronts, again to keep the duration as short as possible. Access for this will be via scaffold. The scaffold will not fit in the 1.5m easement on the Network Rail depot side and we will require more room to carry out this activity safely
    - The in situ concrete retaining walls will be constructed almost last, using traditional techniques
    - With all of the retaining wall works complete, we will complete the filling operation and install the drainage. The connections to the existing pipe run will be carried out under localised traffic management as they require crossing New Road (which is the diversion route for our road closure)
    - On completion of the drainage we will place the sub-base to the road and footways. This will be followed by the kerbs and ducting
    - We will then place the base course surfacing and hand over the works for completion by Eurovia.

- **Works to south of bridge:**
  The works to the south side of the rail bridge will follow similar logic as the north:
    - Excavation to formation level. This may require supporting of the existing services supporting until they are diverted
    - Construction of piling platform to provide a safe and stable working area for the leader rig and attendant crane. This will be similar to the platform detailed on ***Sketch 02***. This requires a wider works area than currently indicated on ***drawing FTC1-100-2-02***. We have looked at alternatives but cannot find a safe, practical solution which requires less working room
    - Pre-auger the line of piles with a leader rig
    - Install the piles using a leader rig. This will be fed by an attendant crane located on the line of the road
    - On completion of the piling works capping beam construction will commence.
    - The anchors will be installed, by a specialist sub-contractor, once the capping beam has been completed and cured sufficiently to take the loads imposed
    - The brick facing to the retaining wall will take place on multiple work fronts, again to keep the duration as short as possible
    - The in situ concrete retaining walls will be constructed almost last using traditional techniques
    - With all of the retaining wall works complete we will complete the filling operation and install the drainage. The connections to the existing pipe run will be carried out under localised traffic management as they require the crossing of Hanworth Road
    - On completion of the drainage we will place the sub-base to the road and footways. This will be followed by the kerbs and ducting
    - We will then place the base course surfacing and hand over the works for completion by Eurovia.

LONGFORD RIVER BRIDGE

Preconstruction Phase

Promptly, following contract award, we'll discuss obtaining Temporary Works Flood Defence Consent. We'll use the indicative scaffold details and piling platform design for the consent application to minimise adverse impact on the programme because of long lead-in often needed for temporary consent.

Canals and River Trust – If required, access agreements will need to be in place for the works. Jackson will support Hounslow Highways in its application for the access agreement.

By engaging the Canals and River Trust early, HH will ensure we mitigate any delay to the start on site of the works due to obtaining consent.

The engagement of our pre-case concrete specialist is critical to being able to complete the bridge works when we plan to. This is due to the beams and parapet being on around a 12-week lead in from placement of the order.

The PMP etc. produced for the Hounslow Road works will also include all of the relevant information for this section of the works too. It will be a single working document for the works as a whole.

Construction Phase

The construction phase of the Longford River Bridge widening works will be carried out concurrently with the Hounslow Road rail bridge works. The two sections do not share the same access and can

be treated independently of one another. Due to the traffic management constraints the River Bridge works will be carried out one side at a time (east then west).

The construction sequence will be as follows:

East Side

- The traffic management will be set up. As per the tender documentation we have allowed to keep a single lane of traffic open at all times using temporary traffic signals (with the exception of five full closures overnight)
- Once the traffic management set up we will carry out the general site clearance
- With a clear site we will install our temporary works to provide a piling platform for the CFA piling rig. **This is detailed in drawing *16044-DRG-001-01*.** This involves placing culverts in the river to effectively increase the length of the existing brick arches. The installation of the culverts will be carried out under a full closure of the road (at night) due to the room required by the crane to lift and place the culvert units. We will then place fill over the top to a level of 21.7m. This solution ensures that the capacity of the river is not reduced (this is a common stipulation of the Environment Agency) and that the adjacent road is not undermined and remains stable
- On completion of the piling platform, our piling specialist will install the CFA piles to the north and south sides
- The piles will then be broken down to the correct level and the in situ concrete pile caps constructed using traditional methods
- With the abutments to each side complete we will again close the road overnight and move the temporary works (culverts) from the east side to the west side
- Removal of the piling platform will allow us to install the precast concrete beams and parapet. This will also require a full closure of the road (at night) to provide the room required for the crane and also the delivery lorries
- The existing parapet will be removed next. While this is taking place, scaffolders will be installing a working platform over the river to enable access to complete the brickwork to the parapet
- Once the existing parapet is removed, we will excavate and install the in situ concrete strengthening beam and piers (again using traditional methods)
- We will then install the new ducts and pour the new concrete infill/deck
- Brick facing to the parapet, and placement of the coping, will follow the completion of the deck
- The bridge will then be ready for the specialist waterproof system to be installed.
- Kerbs will be installed before handing over the bridge for completion of the footway, signals and carriageway surfacing
- Following completion of the brickwork, and concurrent with the waterproofing, kerbing and surfacing, we will remove the access scaffold over the river and backfill the abutments
- This will conclude the construction of the East side works.

West Side

- The west side of the bridge will follow on from completion of the east side. The sequence will be the same apart from the temporary works for the piling platform will already be installed. On completion of the piling works the culverts and fill will also be disposed of and not relocated on site.

Compound Removal / H&S File

- With work complete, the site compound and welfare will be removed
- Inspection and test plan supplied to enable final project sign off
- As-built data and all other health and safety file information will be supplied to the Principal Designer.

Location of fabrication and batching areas

Our methodology does not require this. If, for any reason, this should change the site compound would be used.

Methods for dealing with and reducing dirt / dust / noise

- Dust and dirt will be kept to an absolute minimum. This will be managed by running plant on hard surfaces wherever possible. Where this is not possible we will use sweepers to clean the roads dampen the ground to prevent dust if and when necessary
- Wherever possible the works will be undertaken during the day to minimise nuisance from noise outside normal working hours.

Site Security

[redacted]

***Site set-up* is illustrated below.**

Option B – Vibrationless Piling

The differences between the piling installation method described above and vibrationless installation of the piles is in fact very little. Because the ground conditions make driving the piles very difficult, pressing the piles in still requires the pile line to be pre-augured. This means that a leader rig is still needed to carry out the pre-auguring.

The access requirements, and therefore the temporary piling platforms needed, are the same for both options. Following the pre-auguring the piles will be installed using a piling press (such as a Giken), and not a leader rig as in Option A. The Giken rig will still need to be fed by an attendant crane, just like the leader rig.

As the Giken piling press installation method is slower than vibrating them in with a leader rig, the overall duration of the programme is increased by three weeks.

Proposed site site-up

Environmental Management Plan

Jackson and our supply partners operate fully compliant ISO 14001 Environmental Management Systems. For this project we have designated individual responsibilities to our project team. Project Manager Ian O'Sullivan will be responsible for ensuring these duties are understood and executed in accordance with the EMP. In preparing our PMP, Ian will agree appropriate performance targets and have environmental action plans (EAP) and monitoring and reporting in place for all stages of the project to ensure that relevant documents are available for audit by the client.

Following the award of a contract, the Project Manager and Environmental Manager will undertake a review of the environmental information available for the contract and assess any gaps in the work information. Depending on the client's requirements, the environmental sensitivity associated with the work and the extent of risk a decision is then taken regarding the format of the environmental documentation.

There are two formats in use; a traditional Aspects Register and an Environmental Action Plan (EAP). Both assess the risk associated with our activities in the specific environment and do not rely on generic assessments. Both rate risk and detail operational controls specific to the activities and locality.

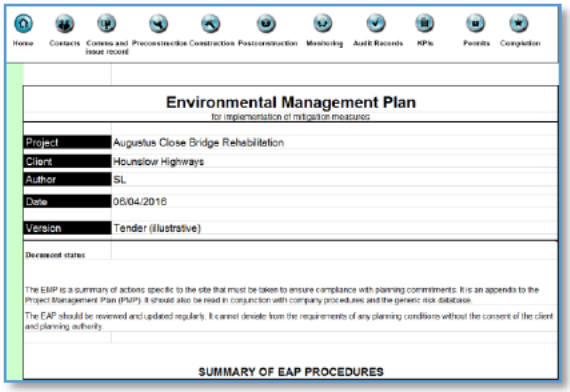
The EAP is generally used where work durations are longer or where environmental receptors are particularly sensitive. It is split into three operational periods; Pre-construction, Construction and Post-construction with sign-off to proceed between each phase. The EAP also details licences, exemptions, permits, objectives and targets.

Where the Aspects Register is used, objectives and targets are included in the Project Management Plan (PMP).

The purpose of both documents is to provide a live and active set of reviewable and auditable controls that can feed into the PMP and site Method Statements. EAP and Aspects Register are regularly reviewed and updated, especially where work scope changes occur.

For the High Street Retaining Walls and Highways Works, we will follow the approach outlined above to develop an EAP that will form part of the overall PMP. It will cover all aspects identified in the tender documents i.e. bats, water mammals, reptiles, invasive species, waste, river pollution etc.

The EMP will be fully developed within three weeks of contract award and will be in the format appended for illustrative purposes together with our environmental aspects register.


Home Contacts Comms and issue record Preconstruction Construction Postconstruction Monitoring Audit Records KPIs Permits Completion

Environmental Management Plan
for implementation of mitigation measures

Project	Augustus Close Bridge Rehabilitation
Client	Hounslow Highways
Author	SL
Date	08/04/2016
Version	Tender (illustrative)

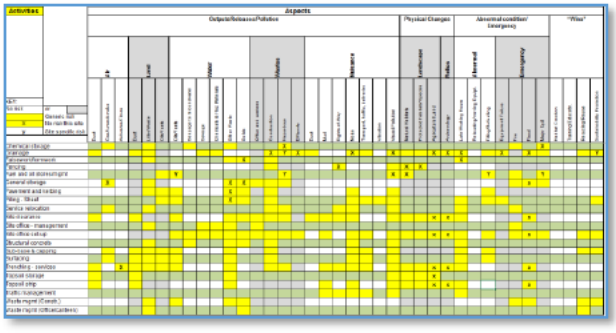
Document status

The EMP is a summary of actions specific to the site that must be taken to ensure compliance with planning commitments. It is an appendix to the Project Management Plan (PMP). It should also be read in conjunction with company procedures and the generic risk database.

The EAP should be reviewed and updated regularly. It cannot deviate from the requirements of any planning conditions without the consent of the client and planning authority.

SUMMARY OF EAP PROCEDURES

EMP (example) see CD for full version. We have also included by way of example a fully populated EMP using this template.


Activities

Aspects

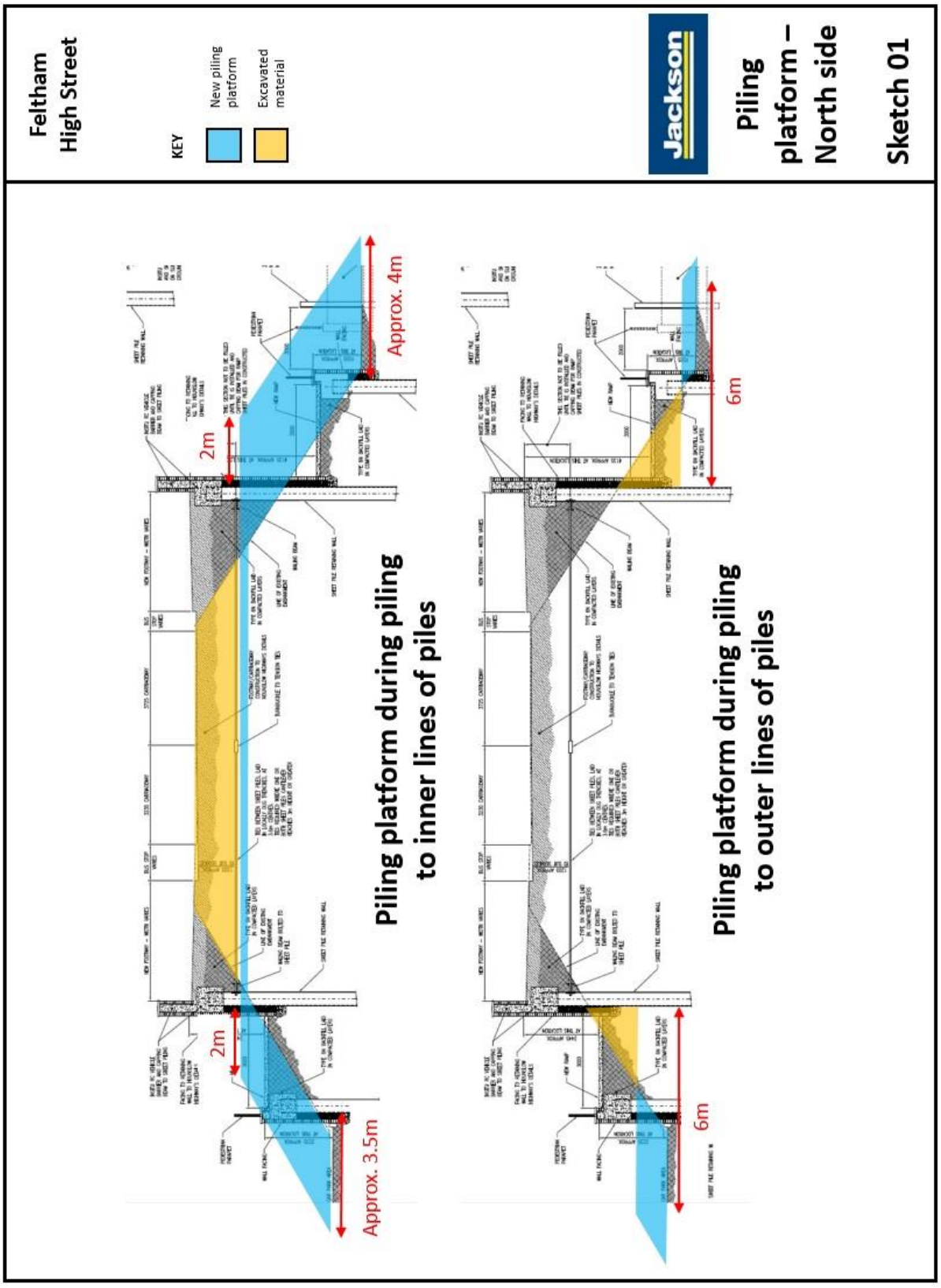
Outputs/Released Pollution

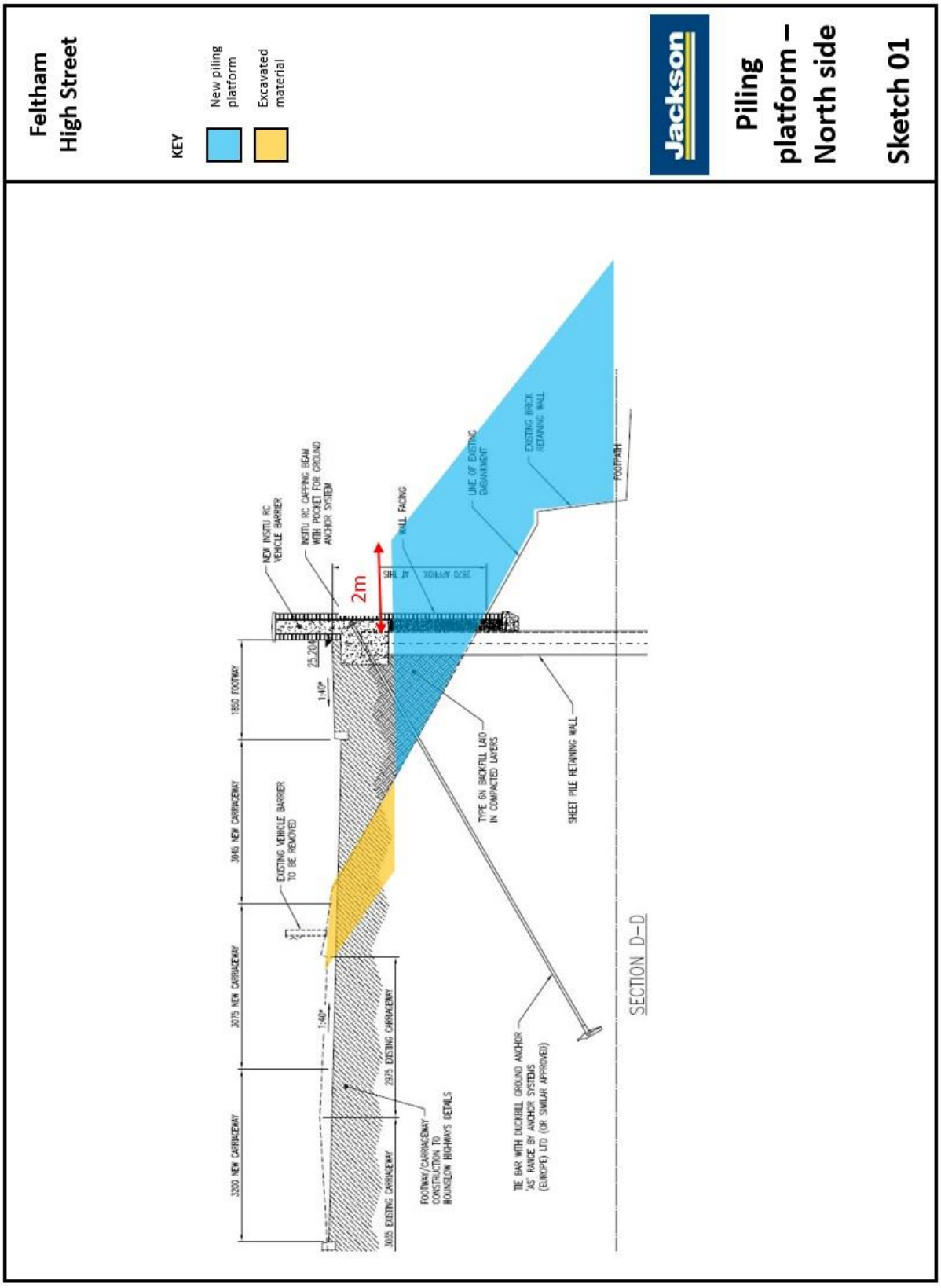
Physical Changes

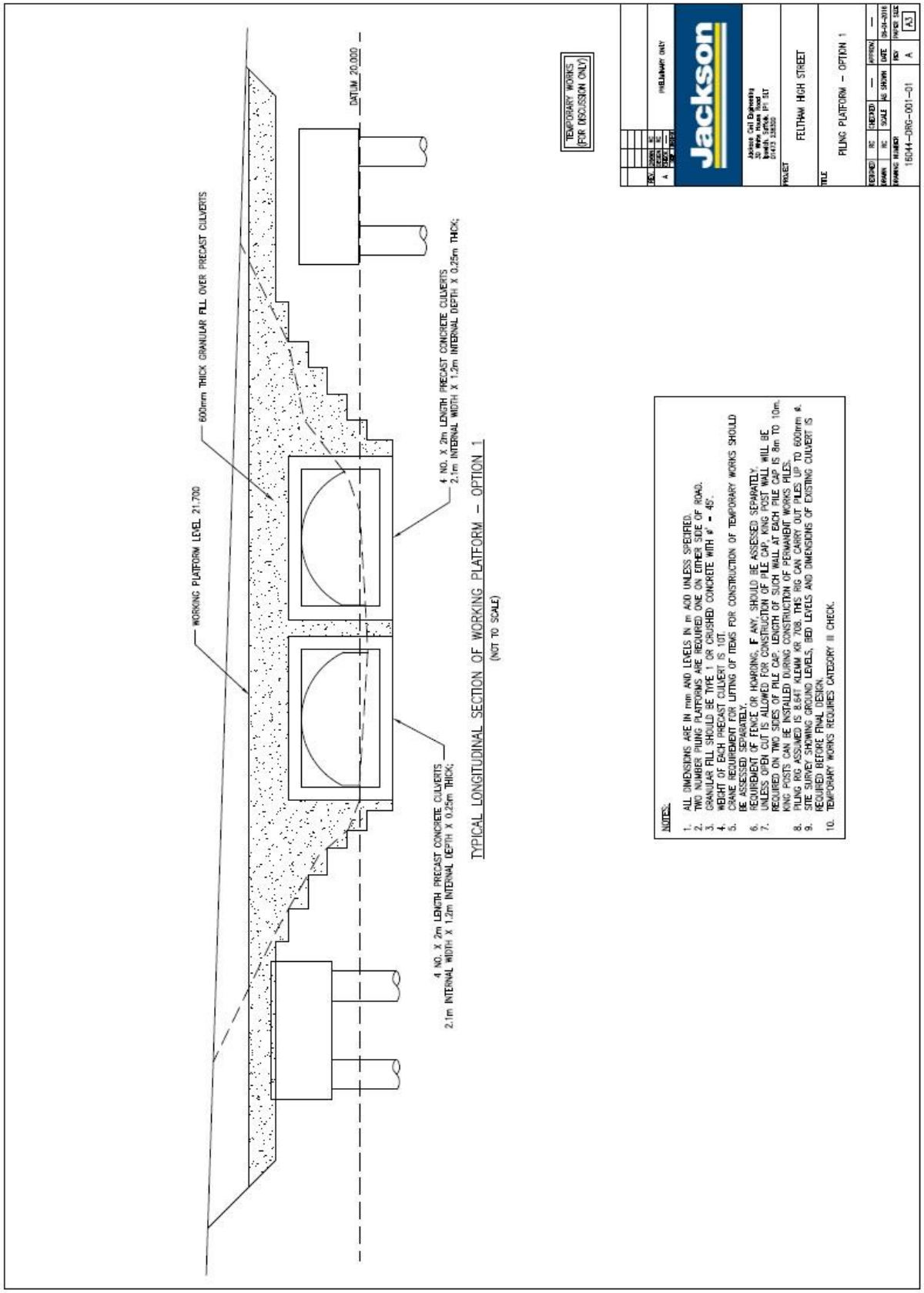
Abnormal condition/ Emergency

"Wins"

Environmental Aspects Matrix (example)


Feltham
High Street
KEY
New piling platform
Excavated material
Jackson
Piling platform – North side
Sketch 01
Piling platform during piling to inner lines of piles
Approx. 4m
2m
2m
Approx. 3.5m
Piling platform during piling to outer lines of piles
6m
6m


Feltham
High Street
KEY
New piling platform
Excavated material
Jackson
Piling platform – North side
Sketch 01
2m
NEW INSITU RC VEHICLE BARRIER
INSITU RC CAPPING BEAM WITH POCKET FOR GROUND ANCHOR SYSTEM
WALL FACING
LINE OF EXISTING EMBANKMENT
EXISTING BRICK RETAINING WALL
FOOTPATH
1850 FOOTWAY
3045 NEW CARRIAGEWAY
3075 NEW CARRIAGEWAY
3200 NEW CARRIAGEWAY
3035 EXISTING CARRIAGEWAY
2975 EXISTING CARRIAGEWAY
EXISTING VEHICLE BARRIER TO BE REMOVED
TYPE 6N BACKFILL LAID IN COMPACTED LAYERS
SHEET PILE RETAINING WALL
FOOTWAY/CARRIAGEWAY CONSTRUCTION TO HOUNSLOW HIGHWAYS DETAILS
TIE BAR WITH RUCKBILL GROUND ANCHOR AS RANGE BY ANCHOR SYSTEMS (EUROPE) LTD (OR SIMILAR APPROVED)
SECTION D–D


WORKING PLATFORM LEVEL 21.700
600mm THICK GRANULAR FILL OVER PRECAST CULVERTS
DATUM 20.000
4 NO. X 2m LENGTH PRECAST CONCRETE CULVERTS
2.1m INTERNAL WIDTH X 1.2m INTERNAL DEPTH X 0.25m THICK;
4 NO. X 2m LENGTH PRECAST CONCRETE CULVERTS
2.1m INTERNAL WIDTH X 1.2m INTERNAL DEPTH X 0.25m THICK;
TYPICAL LONGITUDINAL SECTION OF WORKING PLATFORM – OPTION 1
(NOT TO SCALE)
TEMPORARY WORKS
(FOR DISCUSSION ONLY)
PRELIMINARY ONLY
Jackson
Jackson Civil Engineering
FELTHAM HIGH STREET
PILING PLATFORM – OPTION 1
16044–DRG–001–01
A3
NOTES:
1. ALL DIMENSIONS ARE IN mm AND LEVELS IN m AOD UNLESS SPECIFIED.
2. TWO NUMBER PILING PLATFORMS ARE REQUIRED ONE ON EITHER SIDE OF ROAD.
3. GRANULAR FILL SHOULD BE TYPE 1 OR CRUSHED CONCRETE WITH ϕ' = 45°.
4. WEIGHT OF EACH PRECAST CULVERT IS 10T.
5. CRANE REQUIREMENT FOR LIFTING OF ITEMS FOR CONSTRUCTION OF TEMPORARY WORKS SHOULD BE ASSESSED SEPARATELY.
6. REQUIREMENT OF FENCE OR HOARDING, IF ANY, SHOULD BE ASSESSED SEPARATELY.
7. UNLESS OPEN CUT IS ALLOWED FOR CONSTRUCTION OF PILE CAP, KING POST WALL WILL BE REQUIRED ON TWO SIDES OF PILE CAP. LENGTH OF SUCH WALL AT EACH PILE CAP IS 8m TO 10m. KING POSTS CAN BE INSTALLED DURING CONSTRUCTION OF PERMANENT WORKS PILES.
8. PILING RIG ASSUMED IS 8.64T KLEMM KR 708. THIS RIG CAN CARRY OUT PILES UP TO 600mm ϕ.
9. SITE SURVEY SHOWING GROUND LEVELS, BED LEVELS AND DIMENSIONS OF EXISTING CULVERT IS REQUIRED BEFORE FINAL DESIGN.
10. TEMPORARY WORKS REQUIRES CATEGORY III CHECK.