

145-147 Liverpool Road, Cadishead, Manchester, M44 5BT

Construction Phase Health & Safety Plan

Client: Dominus Real Estate

Site: Premier Inn, Manchester

Contract: 3729

Revision: 2

Health & Safety Plan – Document Control Sheet

See section 2 for details of authorised persons and procedures.

Revision	Detail	Prepared by	Checked by	Date
0	Site Start	Tom Sloyan	Austin Wilkinson	05/12/2023
1	Client Amendments	Tom Sloyan	Austin Wilkinson	18/01/2024
2	Footway Closure Update	Tom Sloyan	Austin Wilkinson	25/01/2024

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1. Project Directory

Client

Dominus Real Estate
14A Shouldham Street
London
W1H 5FJ

Contact: Craig Murray
Tel: 02032195600
Email: craig.murray@dominus.co.uk

Principal Contractor

AW Demolition Ltd
145 – 147 Liverpool Road
Cadishead
Manchester
M44 5BT

Director: Austin Wilkinson
Tel: 0161 696 8520
E-Mail: austin@awdemolition.co.uk

Contracts Manager: Tom Sloyan
Tel: 0161 696 8520
E-Mail: tom@awdemolition.co.uk

Principal Designer

Risk Wise Consulting
21 Sydenham Road
Bristol
BS6 5SJ

Contact: William Clive
Tel: 07766540719
E-Mail: william@riskwiseconsulting.co.uk

Services Consultants (Employed by Client)

TBC

Structural Engineers (Employed by AWD)

TBC

Asbestos Consultants (Employed by Client)

TBC

Health and Safety Executive

HSE Manchester
Grove House
Skerton Road
Manchester
M16 0RB

Tel: 0161 952 8200

Local authority

Manchester City Council
Town Hall
Albert Square
Manchester
M60 1LA

Tel. 0161 234 5005

Highways Email: highwaylicences@manchester.gov.uk

Highway Management Email: highwaynetworkmanagement@manchester.gov.uk

2.0 About This Health & Safety Plan

2.1 Introduction

This Health & Safety Plan is prepared in accordance with, but not limited to, the following:

- CDM Regulations 2015
- BS6187:2011 Code of practice for full & partial demolition
- Health & Safety In Construction L150

The plan sets out specific measures on how this particular the health and safety aspect of this particular project is to be managed in addition to the standard company procedures as set out in our Health & Safety Policy and procedures.

It is the intention of AW Demolition Ltd that the project be designed and carried out in in such a way that the risks to health and safety of all persons engaged in the process are eliminated or reduced to a level which is acceptable under current legislation.

All parties involved with the undertaking of the work have a statutory duty to comply with the H & S Plan and to provide the Principal Contractor with any information that they may have that may have an effect on the work without delay.

Several other documents will be issued to detail, control and monitor the works to be carried out on site, these will be detailed in the relevant parts of this plan.

The plan has been produced in accordance with information and knowledge provided to date, the plan may need to be amended as further information is gathered or situations arise.

2.2 Document Issue, Amendments & Control

Only the following people are authorised to issue and check the Health & Safety plan:

- Managing Director
- Health & Safety Manager
- Contract Manager

As detailed earlier, this document may be subject to change as further information becomes available and as situations arise, in such circumstances only the following people are authorised to make changes and re-issue the Health & Safety Plan:

- Managing Director
- Health & Safety Manager
- Contract Manager

On completion of an amendment, which must be detailed in the Document Control Sheet, the document is to be re-issued to all parties and the changes made known to all concerned on site as necessary.

2.3 Principal Contractor's Duties

As principle contractor AW Demolition Ltd will ensure that the Construction (Design & Management) Regulations 2015 and other obligational regulations are met in their entirety by the following methods:

- From the information provided develop the Health & Safety Plan into a working project document, ensuring it contains all necessary information.
- Implement the Health & Safety Plan and amend as necessary when further information / situations arise.
- Provide a copy of the Health & Safety Plan and associated information to all sub-contractors.
- Obtain from sub-contractors and other associated contractors, site specific method statements and risk assessments together with environmental objectives pertaining to their own activities and the potential impact on the principle contractors own activities and that of other contractors or visitors on site.
- Ensure that sub-contractors / consultants are competent for the work they are being contracted to carry out.
- Ensure that all employees are competent for the element of work for which they are being tasked with.
- Make clear to all operatives and sub-contractors on site (through site inductions) both the clients requirements and the principle contractor's site specific rules.
- Provide health and safety information to all site operatives and sub-contractors on site through induction and regular briefings.
- Take reasonable steps to ensure that all persons on site co-operate as far as necessary to enable each of them to comply with relevant statutory legislation and requirements.
- Maintain the provision of training and safety information to all those persons on site who may suffer risk to their own health, safety and welfare whilst working on the project.
- Monitor health and safety performances of persons and subcontractors working on this project.
- Encourage an open door policy and blame free culture in the reporting of hazards and useful working practises. Promote the statutory requirement of all persons to look after their own safety, well-being and those of others and not to engage in activities that will endanger them and other third parties.
- Maintain notice boards with current information and display all legal notices throughout the project.
- To restrict access to allow only persons authorised to be on site by means of security arrangements.
- To provide and maintain adequate welfare facilities for the employers, employees, project team and consultants from the start to the end of the project as required.
- To procure expert advice and assistance where necessary to discharge obligations and duties identified within the CDM regulations.

2.4 Safety Standards & Objectives

AW Demolition Ltd will, in undertaking the works will:

- Aspire to achieve zero fatalities, zero permanent disabilities and improve safety performance year on year.
- Comply with all current Health and Safety legislation and approved codes of practise

- Ensure compliance with client safety regulations and publish these as part of the project requirements.
- Work with and advise the client in his aspiration to provide a “better” environment for his employees.
- Maintain safe access and egress to the site, particularly for emergencies in order to minimise the disruption to neighbours (including pedestrians/ vehicles)
- Liaise with all local neighbours and tenants in order to minimise the impact of the operation onto the local community including the appointment of a ‘Residents Liaison’ Officer where necessary.
- Identify and address all risks arising from both the work carried out by AW Demolition Ltd and nominated subcontractor’s activities.
- Police and coordinate through our Health and Safety representative the use of safe procedures, plant, tools and appropriate PPE.
- Work with other client representatives (including other contractors employed by the client) to maintain safety and site cooperation.
- Monitor health and safety performance
- Regularly review health and safety performance (statistics gained, incident reports etc)
- Regularly review our procedures and methods of work in line with our commitment to continual improvement
- Assess the impact of site activities on the environment and manage to minimise it.
- Identify and provide health and safety training to promote awareness of self and others.
- Endeavour to complete the works in accordance with the quality standards specified, to programme and budget as per client instructions.

2.6 Health & Safety Policy Statement

AW Demolition Ltd regards the provision of a safe and healthy working environment on our sites as a principle objective. This objective can only be achieved by the cooperation of the company, employees, sub-contractors and the client. Cooperation must be at all levels throughout the individual organisational structures as established under CDM 2015.

AW Demolition Ltd will collaborate with all parties to meet as far as is reasonably practicable to parameters set of in the policy statement issued.

3.0 Project Information

3.1 Project Name

- Premier Inn, One Medlock Street, Manchester, M15 5FJ

3.2 Pre-Tender H & S Information

- Tender Pack
 - Asbestos Register
 - Scope of Works Email
 - Demolition WeTransfer
 - Site Plan

- BREEAM Requirements
- Surveys
- Demolition, ACM Removal, Tree Removal WeTransfer
 - Tender Docs
 - Architect Drawings
 - Draft Prelims
 - Hoarding
 - Surveys

3.3 Drawings

All drawings obtained / generated during the course of the works are to be kept in the site information file and will be made available for reference throughout the works.

3.4 Surveys

If not already provided pre-tender, all necessary surveys will be conducted prior to works commencing to plan the works accordingly by the client e.g. a pre-demolition asbestos survey.

Surveys will be kept in the site information file and will be made available for reference throughout the works.

3.5 Existing Structures & Environment

The structure to be demolished consists of a 5-storey former Hotel Building assumed to be of timber frame with timber pods inserted onto the frame. To the first floor is a slab sat on concrete legs supported from the ground floor slab that supports the upper floors. The building is fitted out to a normal hotel standard with individual rooms off corridors on each side of the building. Externally there is a large tarmac car park to the rear of the building accessed off River Street. To the front on Medlock Street the building fronts the pavement, as such this will be partially closed to facilitate the works.

See section 5 Safety Risk Register for further details.

3.6 Existing Services

It is already known that the following services are present on / directly adjacent site:

- Street Lighting
- Electric
- Gas Services
- Fresh Water Services
- Drainage Services
- Sewer Services
- Telephone/ communication services

All utility drawings provided are to be kept in the site information file / site noticeboard throughout the works.

It is not to be assumed that all services are shown on the drawings given or produced. AW Demolition Ltd will make all reasonable enquiries (as required) with the relevant authorities and to carry out site investigations as may prove necessary to locate existing services prior to commencing work on site.

Where services are not to be disconnected / removed they will be protected where necessary as detailed in the method statement/s.

3.7 Existing Ground Conditions

Good, all work is to be carried out from the rear tarmac car park area.

3.8 Existing Traffic Conditions

The site sits on the corner of Mancunian Way and Medlock Street, both busy roads accessing the Centre of Manchester.

A partial closure of Medlock Street Footway will be required to place hoarding and scaffolding for the duration of the Demolition Works. This will be addressed and organised via MCC Highways Dept. a copy of email acknowledgement can be found in Appendix 6. The design for the associated Hoardings can be found in Appendix 5.

3.9 Surrounding Area

Adjacent and local buildings include:

- River Street Tower – West
- One City Road – North
- First Street Manchester - East

Adjacent and local land uses include:

- Roads
- Footpaths
- Flats
- Offices

3.10 Outline Scope of Work

The demolition works consist of the following:

- Soft Strip of the Former Hotel Building
- Scaffolding to the exterior of the Building to Medlock Street
- Demolition of the Building starting with the West Wing progressing North East
- Removal of all Demolition debris and arising's
- Removal of associated slab and founds to a nominal depth of 1.2m below surrounding ground level.

- Removal of tarmac car park, footpaths, vegetation and boundary walls surrounding the site.
- Excavation and removal of underground tank
- Backfilling as required across the site to leave a safe and level area
- Crush all arising's to 6F2 Grade Recycled Aggregate

3.11 Programme of Work

See – programme of works

3.12 Working Hours

- Monday to Friday 08:00am to 18:00pm
- Saturday 08:00am to 13.30pm

4.0 The Management Team

4.1 Management Team Function

AW Demolition Ltd has selected a team who have a wealth of experience with this type of project covering all disciplines. The team will be deployed to the project to ensure a safe and a timely execution. To achieve this, the team will:

- Integrate with consultants (as required) to achieve the best solutions for the project
- Work as one with the professional team (as required/dictated) and the clients management team to achieve the objectives and safety/environmental goals embraced by the client and published in this document
- Develop a team philosophy with any subcontractors so that mutual understanding can be achieved whilst considering the clients expectations
- Use our depth of management knowledge and experiences of previous projects to ensure a safe, environmentally efficient and productive project is achieved.
- Bring the project to conclusion, on time, within budget and to the satisfaction of the client and his representatives.

4.2 Project Personnel Organisational Chart

Please see specific contract organagram.

4.3 Roles & Responsibilities

4.3.1 Managing Director

- Promote the positive health and safety culture by creating an interest and enthusiasm for health and safety in all activities and set a good example at all times.
- Implement and uphold the company health and safety procedures and policies

- Administer the health and safety policies throughout the company by appointing suitably qualified and experienced/ likeminded employees to assist in his quest to ensure high safety and environmental standards are achieved.
- Ensure the health and safety policy is reviewed and updated as necessary with the in house safety advisor and external safety consultants. He will also make use of other safety proactive senior staff managers and employees within the company.
- Make adequate financial provision for implementing the health and safety policies and procedures.

4.3.2 External SHEQ Advisor

- Promote the positive health and safety culture by creating an interest and enthusiasm for health and safety in all activities and set a good example at all times.
- Be aware of the appropriate statutory health and safety requirements affecting the operations of the company.
- Ensure health and safety factors are considered at all stages of the project and that sufficient resource is available to maintain safe working practises.
- Ensure risk assessments and method statements written cover all appropriate risks. Intervene and suggest changes if required.
- Ensure that the site manager has adequate emergency planning and procedures in place.
- To regularly monitor and record the health and safety performance on site (monthly site audits etc)
- Regularly review the site safety file to ensure compliance
- Secure feedback from all persons on site regarding health and safety. Inform the site manager of his findings and suggestions.
- Ensure that all person on site are aware of their responsibilities regards health and safety
- Constantly communicate directly with the site manager any health and safety issues that may occur.
- Ensure sufficient first aiders are on site.
- Ensure welfare facilities are adequate for the project and numbers of persons on site
- Ensure good housekeeping is maintained at all times.
- Conduct regular tool box talks.
- Ensure all notice boards have relevant documentation attached (F10, emergency procedures etc).
- Co-ordinate the collection of information for the Health & Safety File

4.3.3 Contracts Manager

- Be ultimately responsible for the co-ordination of site health & safety.

- Promote the positive health and safety culture by creating an interest and enthusiasm for health and safety in all activities and set a good example at all times.
- Be aware of the appropriate statutory health and safety requirements affecting the operations of the company.
- Ensure health and safety training is given to all employees as necessary
- Ensure health and safety factors are considered at all stages of the project and that sufficient resource is available to maintain safe working practises.
- Allocate sufficient resource (including financial) to enable health and safety procedures and policies operative effectively.
- Ensure a health and safety advisor is appointed to the project
- Ensure compliance with the company health and safety policies is upheld
- Co-ordinate the services of any design engineers required for the project e.g. a structural engineer
- Collate all available pre-tender information
- Arrange for further surveys / investigations to obtain information necessary to plan and carry out the works safely
- Produce job / task risk assessments and method statements
- Produce RAMS generated throughout the work ensuring all required information is available
- Constantly communicate directly with senior managers any health and safety issues that may occur. The directors then instruct/inform others within the company structure or external consultants.
- Co-ordinate fire and emergency provisions / situations
- Co-ordinate logistics of plant, equipment, resource etc
- Co-ordinate temporary works, electrical works and services detection / isolation
- Ensure that any work @ height has the necessary fall prevention measures in place prior to commencement
- Ensure that there is adequate welfare provisions for the employees on site

4.3.4 Site Managers

- Promote the positive health and safety culture by creating an interest and enthusiasm for health and safety in all activities and set a good example at all times.
- Ensure the health and safety coordinator undertakes his duties and that support is given to this person
- Ensure that all person on site are aware of their responsibilities regards health and safety
- Be aware of the appropriate statutory health and safety requirements affecting the operations of the company.
- Constantly communicate directly with projects manager any health and safety issues that may occur. The projects director then instruct/inform others within the company structure or external consultants

- Instigate any disciplinary procedures required should individuals deliberately ignore their own welfare or others regarding health and safety.
- Ensure all tasks have an agreed risk assessment
- Ensure all tasks have an agreed method statement
- Ensure that operatives adhere to agreed method statements and risk assessments
- Update the safety file daily
- Ensure sufficient first aiders are on site
- Ensure welfare facilities are adequate for the project and numbers of persons on site
- Encourage near miss notification – act and conclude as required
- Ensure good housekeeping is maintained at all times
- Conduct regular tool box talks
- Ensure all notice boards have relevant documentation attached
- Ensure all access and egress routes are clear at all times

5.0 Safety Risk Register

5.1 Introduction

This section highlights the main risks to which AWD employees, and possibly others, will be exposed to from both the existing site conditions and during demolition works. Further identification, evaluation, and control of these risks will be detailed in specific risk assessments and method statements generated throughout the course of the works.

5.2 Risks From Existing Site Conditions

The following outline risks are likely to be encountered during the planning stage (carrying out site investigations etc) and when preparing the site for demolition works, although some may remain present throughout:

Hazard	Description	Control	Client/ contractor/Other
Exposure to Asbestos	All forms + debris	Wear appropriate PPE & RPE when entering areas	Contractor
Exposure to Pigeon / Gull guano	Guano to floors and surfaces	Wear appropriate PPE & RPE when entering areas	Contractor
Entering unsafe areas of building		Cordon off area, wear PPE	Contractor
Exposure to harmful / hazardous substances	Residual products	Supply adequate PPE & RPE	Contractor
Slips, trips, falls and minor injury	Loose cable sheathing & poorly lit areas	Use temporary lighting, wear PPE	Contractor
Site Traffic	Vehicles on roads	Wear High Vis clothing, adhere to walkways	Contractor

5.3 Risks Encountered During Works

Below are outline risks associated with this project at demolition stage:

Hazard	Description	Control	Client/ contractor/Other
Exposure to Asbestos	All forms + debris General	Cordon off areas, wear appropriate RPE & PPE, programme removal as per CAR 2012	Contractor
Exposure to harmful / hazardous substances	Residual products	Supply adequate PPE, RPE, washing and welfare facilities. Sample suspect materials and remove accordingly	Contractor

Flammable substances / atmosphere	Residual chemicals and vapours	Do not smoke Investigate and test areas prior to burning etc	Contractor
Entering unsafe areas of building	Loose northlight glass windows	Cordon off areas. Remove if entry to area unavoidable prior to demolition wearing adequate PPE	Contractor
Slips, trips, falls and minor injury	Loose cable sheathing & poorly lit areas	Use temporary lighting Wear adequate PPE Clean areas if access is unavoidable prior to demolition	Contractor
Soft stripping	General	Wear adequate PPE Correct plant Correct hand tools Clear debris in a timely manner Establish emergency procedures Good housekeeping	Contractor
Exposure to live Services	General	Obtain isolation certificates CAT scan if required	Contractor/ Client
Vehicle access/egress	General	Establish control measures Good housekeeping	Contractor
Demolition Methodology	Structural issues, method & sequence	Structural evaluation of by independent engineer. Daily controls and evaluation during demolition process. Protection in place for key impact areas. Establish exclusion zones around machinery etc	Contractor
Proximity to Public Realm	Interface with Public during works	Building fronts Medlock Street, River Street and Mancunian Way. Scaffolding will protect the works in these areas and the site will be	Contractor

		segregated using a 2.4m Timber Hoarding. This will be checked and installed per relevant TW designs.	
Injury caused by machinery	Crushing / entrapment etc	Correct Machine Selection Only trained ops to use plant & machinery Machine movements to be controlled by banksman Exclusions to be in operation around each machine	Contractor
Dust	Airborne dust generated by demolition	Continually spray during demolition if required Monitor wind conditions and plan accordingly	Contractor
Processing of materials	General	Establish exclusion zones Use correct plant Suppress dust by water spray Good housekeeping	Contractor
Fire	General	Establish site fire plan & evacuation procedures Provide fire fighting eqpt for small fires	Contractor
Noise	Use of machinery	Monitor & record sound levels for all activities Issue suitable PPE where noise generation method cannot be alleviated	Contractor
Manual Handling	Lifting during strip out	Provide mechanical means wherever possible Train employees and reduce loads to manageable sizes	Contractor
Storage of fuels and hazardous substances	Fuels etc	Minimise fuel storage on site. Store materials in locked containers / bunded tanks etc as appropriate	Contractor

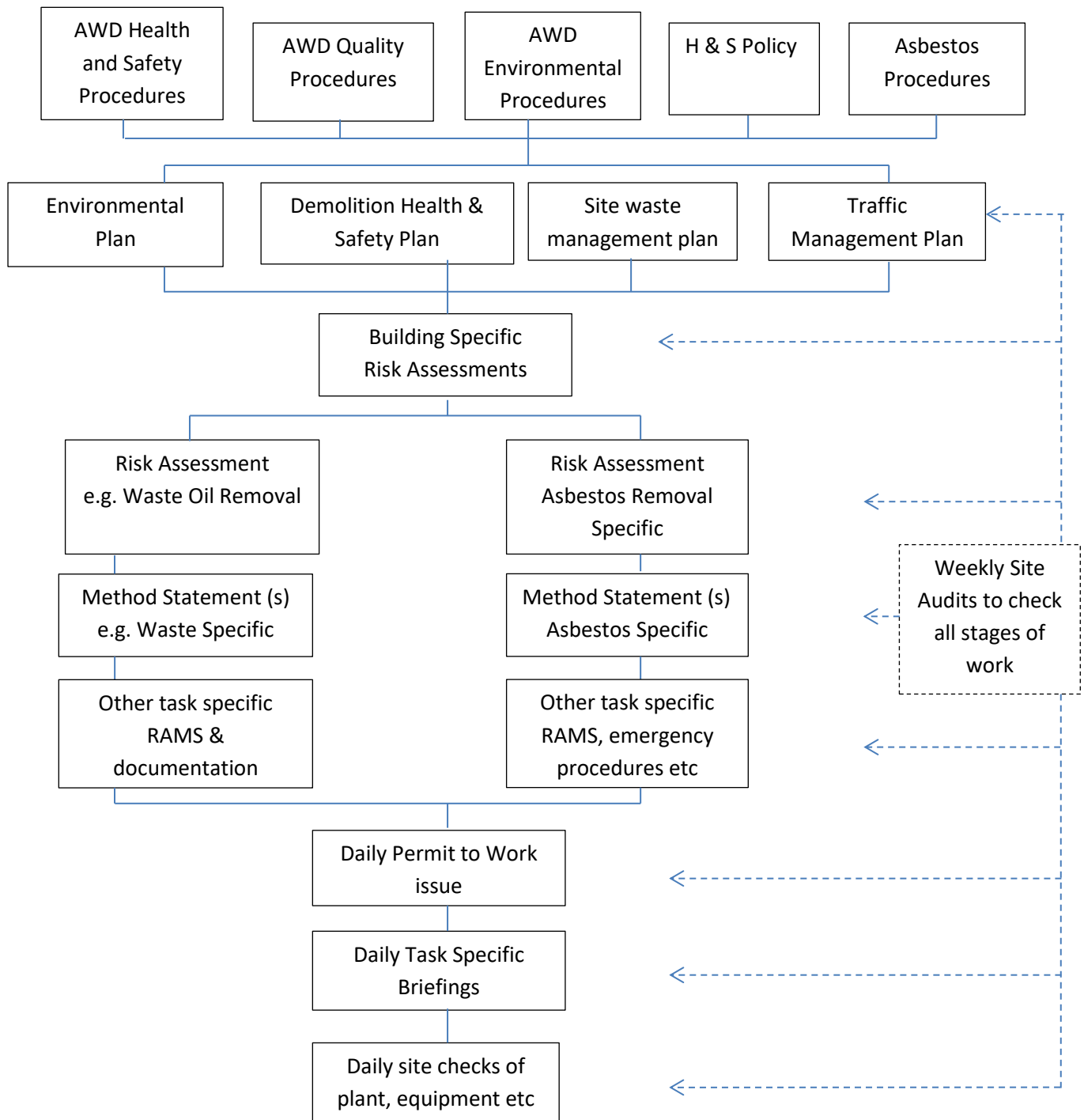
Temporary services	Electricity to cabins etc	All electrical supplies to be installed and tested by suitably qualified persons only	Contractor
Falls	Fall from height / unguarded voids etc	Cover over / protect any voids / apertures in floors prior to commencing work All work @ height to be carried out off scaffold, MEWPS etc	Contractor
Maintenance of plant & equipment	Injury / unsuitable to carry out repairs	Maintenance to be carried out by AWD fitters only if safe to do so on site. Machines to be returned to yard for repairs.	Contractor
Pedestrians	Injury	See traffic management plan and injury by machine / vehicle	Contractor

6.0 System Procedures & Documentation

6.1 Introduction

Exposure to risks in connection with this project are both common to our industry and specific to the work being undertaken. Risks will be minimised by the implementation of standard company procedures as set out in our company policies together with site specific methods of working. Generation and review of documentation will be continual throughout the project to ensure risks are minimised to an acceptable level in accordance with current legislation.

6.2 Site Documentation Hierarchy



6.3 Company Policy & Procedures

Company policy and procedures are written to our industry and are to be adhered to at all times.

Such policies and procedures will be reviewed at least annually and following any report / incident which may be related to procedural issues.

6.4 Site Specific Documentation

Site specific information will be generated continually throughout the project as information is received, situations change and different methods are adopted to ensure encountered risks are minimised to an acceptable level in accordance with current legislation.

Such documentation will be audited on a regular basis by the External SHEQ Advisor.

Detailed below is a guide as the contents of site specification to be produced:

6.4.1 Risk Assessment

For site wide elements the risk assessments will be developed by AW Demolition Ltd and any sub-contractors, prior to any task taking place. They shall identify but not be limited to the following (guide only):

- Consider the task
- Consider all hazards
- Identify persons at risk
- Conclude a "risk rate factor" prior to implementation of control measures – Likely hood x Severity
- Apply control measures
- Re-evaluate the "risk factor" following control measures suggested (Likely hood x Severity)

The assessment will be as short and concise as possible, but cover all potential risks. On completion it should:

- Be read, agreed then signed by all parties
- A copy be kept in the site safety file and be available at all times
- Not be deviated from by those carrying out the work
- Be amended, signed and changes made known to all concerned if the hazard / control measures change
- Be added, together with any amended versions, to the list of established risk assessment method statements in this plan – see appendix 2.

6.4.2 Method Statements

Method statements will contain the following details (guide only):

- Description of the works
- Where the activity is being carried out
- Identity of hazards

- PPE
- Existing services
- Risk controls
- Environmental controls

The statement will be as short and concise as possible, but cover all potential risks. It should be kept in mind that they are in place not only to inform the operative how he should carry out his task but in describing to other involved parties the tasks being carried out. On completion it should:

- Be read, agreed then signed by all parties
- A copy be kept in the site safety file and be available at all times
- Not be deviated from by those carrying out the work
- Be amended, signed and changes made known to all concerned if the hazard / control measures change
- Be added, together with any amended versions, to the control list of established risk assessment method statements in this plan – see appendix 2.

6.4.3 Emergency Procedures

Site specific emergency plans and procedures will be generated and amended as the work progresses. Such plans will include (but not limited to):

- Fire & evacuation procedure
- Premature collapse
- Confined space rescue
- Work @ height rescue

Such plans are to include (but not limited to):

- Those responsible for its implementation, its communication and its continual monitoring and development
- Means of raising alarm
- The co-ordinator who will instigate the plan in case of emergency
- Contact numbers of emergency services
- Emergency procedures to be adopted
- Exit routes shown on plan

Emergency Plans, including amended versions, will be added to the Control List for EP'S in this plan – see appendix 3, see section 10 Accident & Emergency procedures, for further information.

6.4.4 Traffic Management Plan

A site Traffic Management Plan will be developed and implemented prior to commencement of the works in conjunction with a traffic management company. The key areas of the plan will state as follows:

- Diversion routes for roads and pavements
- Defined times for implementation and removal of closures and diversions
- All necessary notifications to the Highways and council

- Clear traffic routes for all site vehicles entering and egressing the site for the following:
 - Waste removal from site
 - Drop off for skips
 - Deliveries
 - Transit routes for workforce and management / visitors on foot.
 - Subcontractor Activities
 - Movement of machines and materials within the site boundary
 - Parking areas
- Communication of the Traffic Management Plan to AWD Workforce, Visitors and Subcontractors
- Site Plan detailing the traffic and pedestrian routes.

Traffic Management Plans, including emended versions, will be added to the Control List for TMP'S in this plan – see appendix 4.

6.4.5 Site Waste Management Plan

This plan must take into account the clear objectives of the Waste Management Strategy along with those responsible for its implementation, its communication and its continual monitoring and development, it will also:

- Take into account the processes for dealing with all known materials resultant from the demolition process.
- Have a clear strategy for the minimisation of wastes to landfill / treatment and must maximise recycling wherever possible.
- Be compliant with current WRAP Protocols.
- Be reviewed and maintained on a regular basis.
- Detail all disposal / recycling sites to be used must be documented and site licences reviewed.
- Include all waste movements must be recorded on a load by load basis and a weekly summary provided.
- Detail Pollution Control
- Include emergency procedures for dealing with spillages

Site Waste Management Plans, including emended versions, will be added to the Control List for SWMP's in this plan – see appendix 5.

6.4.6 Environmental Control Plan

An Environmental Management Plan will be developed and implemented prior to the commencement of the works. This plan must include a HAZID Risk Assessment as well as the following items:

- Pollution Control Procedures
- Emergency Spillage Procedures
- Dust Control procedures
- Noise Control Procedures
- Asbestos Monitoring Procedures
- Fire Safety Precautions
- Impact of operations onto Birds / Bats
- Communication of the Plan to the workforce and subcontractors

Environmental Control Plan, including emended versions, will be added to the Control List for ECP's in this plan – see appendix 6.

7.0 Arrangements for the Management of the Site & Activities

7.1 Design Works

Prior to commencement on site, all hazard identification elements raised as part of the methodology design process shall be highlighted to the appropriate persons.

Any work that involves design proposals/changes will be related to the client.

Hoarding Design can be found within Appendix 5 of this document. This details the two hoarding construction types around the site perimeter.

7.2 Security

Timber Hoarding complete with lockable gates will be erected around the perimeter of the site. Gates are to be kept guarded / locked when not in use.

Access to the bridge will be prevented with solid timber type hoardings and signage.

Out of hours security will be provided by means of full-time security personnel/CCTV Cameras as required.

7.3 Warning Signs & Notices

'Danger – Demolition in Progress' signs will be posted around demolition enclosures.

A 'site safety equipment' sign will be posted at the main entrance detailing the mandatory PPE & RPE requirements for entry on the site.

A site information board will be placed in a prevalent position whereby all safety notices and information such as fire plans can be easily accessed by all on site. This will be regularly updated by the site manager / supervisor.

7.4 Site Rules

Each and every employee, sub-contractor and visitor (unless escorted) will attend an induction prior to carrying out any works where by the following site rules will be explained:

- All persons working / visiting the site must sign in / out.
- Observe and carry out instructions given by the site manager, site supervisor, the client or his representative
- High visibility vests/jackets to be worn at all times.
- Head protection must be worn at all times in designated areas.
- Suitable protective footwear must be worn at all times;
- Hearing, dust and other personal protection must be worn - as required

- Ladders must be in good condition, lashed or footed, and stored away outside working hours.
- Only trained and authorised persons are allowed to operate plant;
- Lifting appliance or equipment must have statutory documentation
- All electrical equipment must be maximum of 110v (PAT tested) or battery operated and all be in good condition/ fit for purpose.
- All accidents must be reported to Site Management.
- Be aware of emergency notices
- No Smoking rules must be observed – smoking only permitted in designated areas
- No combustible materials to be left on site where there is a risk of fire
- No eating in the workplace except designated welfare accommodation.
- Radios, personal tape recorders or portable CD's will not be permitted on site (except for use in the welfare accommodation)
- Acceptable standards of personal hygiene should be maintained by site personnel at all times
- Access for emergency vehicles must be maintained at all times
- Operatives will be expected to behave in a courteous manner to all during the works
- The use of bad or offensive language will not be tolerated on site
- Burning of timber will not be tolerated
- All vehicles are to be supervised when entering or leaving the site.
- Ensure adequate supervision including use of a banks person is provided for movement of all mechanical plant.
- Agreed access routes and speed limit of 5mph must be observed at all times or that limit stipulated by the client.
- All manual handling is to be carried out strictly in accordance with The Manual Handling Operation Regulations; 1992
- Monitor and reduce noise emissions to the lowest level practicable
- Urinating on site except in the facilities provided is strictly forbidden.
- Any person who engages in 'horseplay' or wilfully endangers by their actions or neglect will be instantly removed from the site.
- Any 'near miss' incident must be reported to the site manager.
- Entry into a confined space will only take place under a 'Permit to enter'
- Should any suspect hazardous material (asbestos fibres) is uncovered, work will cease immediately and the site manager informed.
- All general rubbish must be stored in suitable containers and removed from site on a regular basis.
- Storage of materials and equipment kept secure at all times, especially when not supervised or outside of working hours.
- All visitors to the site must report to AW Demolition site office or site manager where induction and protective clothing will be provided (PPE issue if deemed necessary or required). Visitors will be escorted around the site at all times.
- Drug and alcohol abuse is forbidden on site, any operative that is found not abiding by this rule will be removed from site.
- Lone working on site is not permitted

Any person found not to be adhering to site rules may be asked to leave site (at the discretion of the Site Supervisor / Manager) and may be subject to disciplinary action.

7.5 Access, Egress, Deliveries & Collections from Site

Appropriate signage will be placed at, and on approach to the site entrance as necessary.

Particular care is to be afforded by drivers of vehicles and plant when accessing / exiting the main carriageway.

Access / egress to and from the site will be via River Street.

All drivers are to be adhere to site speed restrictions and traffic routes.

All drivers are to be directed to the site manager / supervisor before loading / offloading and a banksman provided when necessary to supervise.

Access to the site will be maintained at all times for emergency services vehicles.

Parking is to be permitted within designated positions only.

Wagons will be restricted to on site roadways and hardstanding areas.

Wagons, plant and equipment will be required to use the on-site wheel washing facility prior to leaving site / being loaded onto wagons.

Where and when necessary, the local carriageway will be cleaned on a regular basis by a sub-contract road sweeping company.

All vehicles will access from River Street after they have turned off Medlock Street observing the one way enforcement on River Street.

Vehicles will turn left into the site and through the double access gates into the compound.

General HGV Deliveries and collections will be during normal site working hours but avoiding peak times "rush hour"

Large or "Abnormal" loads such as excavators will be delivered during quiet times or out of hours to avoid any significant interface with heavy traffic and high volumes of pedestrians. These loads may be subject to times set by the Movement Orders approved by local police and Highways Authorities.

Further traffic control arrangements will be detailed in the relevant Method Statement.

Further traffic control arrangements will be detailed in the Traffic Management Plan.

7.6 Pedestrian Routes

Footpaths external to the site will be partially closed for part / the duration of the works. These will be diverted by the shortest route including protection measures where possible.

A banks person will be employed to supervise the movement of demolition plant across any footpaths.

MCC have received and acknowledged an application for this Partial Closure of Medlock Street to facilitate the positioning of the planned hoarding and scaffolding. The details for this are shown in Appendix 1 Site Plan, Appendix 5 Hoarding Design and Appendix 6 MCC Acknowledgement. Ongoing liaison with MCC Highways will be undertaken to ensure that the closure is not impacting on pedestrian and road users.

On site traffic and pedestrians (workers) will be separated at all times with demarcated walkways throughout the site and by means of exclusion around plant and operations.

7.7 Temporary Protection Measures

- Herras type perimeter fencing around internal work areas.
- Temporary barriers, signage, cones etc as required.

7.8 Welfare Provision

The following will be made available and maintained from the start until the end of the project to suit the number of employees, staff and visitors:

- Toilet block/s
- Canteen/s (incl. kettle, toaster, fridge & microwave)
- Site office/s
- Drying room

All units will be powered from generators.

7.9 Plant & Equipment (Incl MEWPS)

Only suitable plant and equipment shall be sourced and used on the contract.

On delivery the plant and equipment will be subject to a visual inspection and must have all necessary certification, documentation and user manuals present with it.

All equipment will be subject to a recorded daily inspection whilst on site and will not be used if found to be defective or out of test.

Only competent operators will be permitted to operate plant and machinery.

7.10 Vehicular Movements On Site

Site vehicles are to keep to designated roadways on site and where necessary will be under the control of a banksman.

Plant & machinery will operate a flashing beacon when in operation.

7.11 Fire Prevention

It is the policy of AW Demolition Ltd to carry out projects so as to eliminate risk from fire and to this end have adopted the code of practise laid down in HSE guidance "fire prevention on construction sites". To achieve this, the following actions will be taken:

- Fire extinguishers, fire notices, fire detection, alarm systems and fire exit signs will be provided for all working areas - as required.
- Buildings will be soft stripped to remove flammable materials prior to demolition
- General rubbish will be cleared from site on a regular basis
- Materials and general rubbish stored on site will be kept to a minimum.
- Site working and access areas will be kept clean so far as reasonably possible
- Hot works (burning operations) will cease 30 minutes prior to completion of shift to ensure no molten metals can cause fires.
- Where flammable materials (LPG/propane/Oxygen) are kept on site, they will be stored in fireproof cages/containers or behind designated heras fence, away from fire routes and potential fire hazards.
- Site accommodation will be of a half-hour fire resisting construction and class 1 spread of fire.
- A "no smoking" rules will be imposed in all working areas. Designated smoking areas will be in force.
- AW Demolition Ltd will operate a "hot work permit" system if the work involves a naked flame (known as burning). In the event of a fire the person discovering the fire shall raise the alarm and immediately report his findings to the site manager.
- Fire drills and evacuation procedures are to be practiced regularly.
- A person may attack the fire with the appliances provided only if they are trained to do so and as long as there is no risk to themselves or others.
- If the fire cannot be safely tackled then all persons shall immediately leave the site by the nearest egress and report to the person designated in charge of the muster point.
- The site manager or his representative shall make a record of all those who have vacated the site and ensure that the emergency services have been summonsed.

7.12 Rubbish / Waste

Waste will be segregated and removed from site on a regular basis.

A reasonable standard of housekeeping will be maintained throughout, especially when carrying out internal soft stripping works.

7.13 Material Storage

Materials are to be stored in locked cabins when not in use off site.

Hazardous / flammable materials will also be kept under lock and key in suitable and labelled containers.

If fuel is not being delivered directly to each machine then suitably banded and lockable fuel tanks will be used for it's storage.

7.14 Manual Handling

Manual handling will be kept to a minimum and bags filled to manageable levels only. Mechanical plant and equipment will be utilised to move heavy loads. Waste routes will be

kept as short as possible. Task specific risk assessment and method statements will detail any manual handling risks and control measures.

7.15 Falls From Height

Work @ height will be avoided wherever possible. Where un avoidable suitable methods will be put in place to minimise risk to those carrying out the work and to those in the local vicinity. Task specific risk assessment and method statements will detail any work @ height risks and control measures.

7.16 Materials Falling From Height

Cordon zones will be placed around areas where materials are being removed from height / high level works are being carried out. All persons on site are to adhere to mandatory PPE requirements.

7.17 COSHH (Control of Substances Hazardous To Health)

Exposure to hazardous substances will be controlled by the following methods:

- Any hazardous substance brought on to / known to present on site which we may be exposed to will have a suitable COSHH assessment and material data sheet.
- Copies of the assessment will be readily available on site and made known at induction / daily briefings as necessary.
- All substances are to be stored, used and their use monitored as detailed by the manufacturer/ COSHH data sheets.
- Any unknown substances encountered are to be sampled and COSHH assessments compiled accordingly for their removal.

7.18 Noise

AW Demolition Ltd will proactively seek to reduce noise generation as far as reasonably practicable including, but not limited to:

- Selection and use of silenced machinery.
- Implementation of sound barriers where practicable.
- Ensuring that PPE is available in order to comply with “noise at work regulations 2005”
- Carrying out noise assessments if required

7.19 Permit To Work Systems

All work will be controlled by a task specific Permit To Work system. These will be issued by the Site Manager / Supervisor as appropriate and will be valid for periods between 1 and 7 days dependent upon the type of permit. Permit will only be issued when all the required criteria has been met.

8.0 Selection & Vetting of Labour & Sub-Contractors

8.1 Introduction

The correct selection of competent labour and sub-contractors is critical in ensuring risks are reduced and the work is carried out on time. Sub-contract companies and individuals will be will have to meet the criteria set out in our policies and procedures as applicable but more importantly they must be deemed competent including:

- Sufficient knowledge of the specific tasks to be undertaken and the risks the work will entail (information)
- Sufficient instruction, mainly for employees
- Sufficient experience, ability and training (where necessary) to carry out their duties in relation to the project ; to recognise their limitations and take appropriate action in order to prevent harm to himself, those carrying out the work, or others affected by the work.

8.2 Sub-contractors

Sub-contractors will initially be chosen based on their past experience and performance on similar projects. Competency checks will include, but not limited to:

- Health and safety policy
- Insurance details
- Management structure
- Risk and COSHH assessments
- Site specific method statements
- Confirmation that they will comply with Technical demolition's health and safety plan
- Confirmation that plant to be used is compliant
- Confirmation that all employees are trained for the task required
- Confirmation that all employees have relevant training certificates and that they are in date
- Evidence of CSCS/ NVQ/ City & Guilds or other accreditation/ certification
- Accident, incident, enforcement and court action details

8.3 Employees

Employees will be selected using the companies Training & Skills Matrix to identify individuals competent in carrying out the desired task/s. It may be decided that further course specific training and 'on the job' training will be given to individuals to ensure competency and further enhance their own skills set.

9.0 Obtaining & Providing Information

9.1 Introduction

To ensure the project is carried out in the most economic manner and with minimal risk, it is imperative that all known information is made available to all concerned at the earliest opportunity, in a clear and understandable manner. The ways that this information is obtained, exchanged and divulged is detailed in the following sections.

9.2 Pre-Tender Information

Relevant information gained pre-tender stage will be made available on site, to sub-contractors and any other parties concerned.

9.3 Client Meetings

Information about site conditions, safety matters and progress etc will be obtained and provided at the following meetings to be held with the client and / or his representatives at regular intervals:

- Pre-tender meetings
- Pre-start meetings
- Progress Meetings

Minutes of meetings will be taken and distributed accordingly.

9.4 Sub-Contractors

Relevant information will be provided to sub-contractors at pre-tender stage and throughout the contract as required at site induction, progress meetings, by regular updates (e-mail, telephone etc) and as displayed on site. Such information will include, but not limited to:

- Site information and surveys
- Risks to their health and safety arising from the environment in which the project is to be carried out
- Copies of any relevant existing method statements/ risk assessments for activities which could impact/have a possibility of impact on them including revised versions as they are issued
- Initial site induction training will be given to all subcontractor employees.
- Inductions will be signed as agreed and understood – records to be kept by the site manager
- Subcontractors will come under the jurisdiction of AW Demolition Ltd and CDM regs: 2007 they will be subject to the rules and procedures set out by AW Demolition Ltd.
- Maintenance persons who spend limited time on site may receive a lesser induction for the task and the area in which are to carry out their task.
- The need for representatives of all subcontractors to attend regular meetings with the site manager to discuss health, safety and progress. This information will be conveyed to the CDM coordinator and or client if deemed necessary
- All subcontractors will be issued with a project directory and developed Health & Safety Plan.

9.5 Personnel Training

9.5.1 On site Training

Tool box talks will be given for general health and safety matters on a weekly basis to all employees and subcontractor's employees. When the need arises specific tool box talks will be given to individuals or collectively. Tool box talks will be signed as understood and agreed by all parties and filed in the site safety file held in the site manager's office.

9.5.2 Task Specific Training

As detailed in Section 8 employees will be chosen for certain tasks based upon their skills and training received etc. The training certificates of all employees, and sub-contractor employees where applicable, will be checked for validity. Training will be monitored via the Training and Skills Matrix and training will be provided where refresher training or a skills gap is identified.

9.6 Site Induction

All employees, sub-contract employees and visitors (unless escorted) will be inducted by the Site Manager / Supervisor prior to commencing works. The site induction will follow the format detailed below together with any site specific information:

- Site Manager (His/her name) – responsibilities
- Foremen (His/her name) – responsibilities
- Site Address
- Site Telephone numbers
- Site Fax Number
- Site layout, access, egress, boundaries
- Welfare facilities and their use/ expectations required by the site manager
- Toilets facilities and their use/ expectations required by the site manager
- Drying room facilities and their use/ expectations required by the site manager
- Storage container facilities and their use/ expectations required by the site manager
- An introduction into the following documentation (job roles will require different degrees of explanation):
 - Health & Safety Plan
 - Environmental Control Plan
 - Site Waste Management Plan
 - Traffic Management Plan
 - Risk Assessments & Method Statements
 - Site drawings (services etc)
- Accident Reporting procedures
- All accidents to be reported to site manager who will make the appropriate recording in the site accident book and any other action as detailed.
- First Aid
- Name of First Aider
- Explain First Aid Facilities
- The First Aid Facility location/ locations
- Fire Precautions
- Fire extinguishers positions within the welfare facilities and around the project area.
- Explain that the extinguishers are for use in emergency situations only and must not be moved nor abused.
- Explain – In the event of a fire or dangerous occurrence the person who discovers the same should raise the alarm, proceed to the designated muster point, located at various positions on the site and inform the site manager immediately.
- Evacuation – All persons evacuating any part of the project must report to the designated assembly point:- Explain/ show locations
- All operatives should report to this area to enable an appropriate head count to be taken.
- All subcontractors trade foreman will be responsible for advising the site manager of head count following a muster point role call.

- On no account should anyone re-enter the project site/ buildings unless authorised to do so by the site manager or his designated representative.
- No task shall be performed unless a specific method statement and risk assessment has been written, agreed, understood and signed by all parties involved in the task
- Upon no circumstances should methods change unless agreed and authorised
- Should further risk become apparent that have not been included in the written risk assessment for the task being undertaken then work must stop immediately. Further control measures are to be agreed, written, understood, signed for and implemented.
- Smoking is only permitted in designated areas:- Show locations
- PPE Requirements Compulsory Minimum Requirement:-
 - Hard Hat
 - Safety Footwear
 - Light eye protection (LEP) or goggles - as required
 - Hi viz vest / jacket
 - Gloves - as required
 Discuss details of PPE to be used for the tasks to be undertaken.
- Scaffold is provided for safety and access only
- If the person requires any scaffolds to be altered discuss changes with the site manager
- Housekeeping – all persons are required to remove any uncontrolled debris/waste material arising from works and to deposit in agreed locations.
- Before any materials are brought onto site discuss with the site manager
- All personnel that require certification to undertake certain tasks must produce the original certificate for inspection by the site manager
- Explain that AW Demolition Ltd Company operate an open door policy for Worker Consultation.
- Explain to the person/persons that if they have any concern regarding safety issues they should inform the site manager immediately
- Parking of vehicles must be in the agreed areas only
- All persons on site must Co-operate with AWD site Management at all times.
- All persons on site must work safely, having due consideration for themselves and others who may be affected by their actions.
- Report to the site manager any accidents/unsafe working conditions.
- Report to the site manager any defective plant or equipment.
- **Do Not** use any plant for which you have not been trained.
- **Obey** all site safety notices and signage.
- **Do Not** indulge in any horseplay or be under the influence of drink or drugs.
- **Do Not** intentionally misuse anything provided in the interest of Health & Safety Welfare.
- Keep your workplace tidy and free from hazards.
- Breaches of any safety rule will result in disciplinary action.
- All operatives and visitors who have attended this Induction are to sign the induction Log.

9.7 Displaying of Statutory Notices

Statutory notices will be displayed on site notice boards in accordance with current legislation and shall include:

Health and safety at work law poster (which includes the safety representative details of AW Demolition Ltd)

- Employers liability insurance
- HSE F10

- Emergency arrangements
- Fire evacuation arrangements and site plan detailing muster points
- Hazardous and near miss forms that can be completed by all persons and passed to the site manager.
- AW Demolition health and safety committee (if deemed necessary)
- Snatch route to hospital

9.8 Site Register & Documentation

The following will be available on site, but not limited to:

- Accident book
- Record of inspections required under “lifting operations and lifting equipment” regulations; 1998
- Record of scaffold inspections as required by the “work at height” regulations; 2005
- Waste management plan (£300,000 and above) - Waste transfer notes
- COSHH hazard data sheets and associated risk assessments
- Plant inspection records
- Risk assessments
- Method statements
- Lifting plans
- Site plans
- Training & Health surveillance
- Emergency procedures
- Manual handling assessments (could be included in task risk assessments)
- Record of daily site briefings
- Record of tool box talks
- Record of site inductions

Current versions of the above information (where applicable) will be shown and explained to persons at induction stage e.g. a method statement. When the person understands the contents of the document they are to sign and date the document as a declaration that they have read it, understood it and will adhere to the instructions set out within it.

The process will be repeated for all on site staff when revised documents are issued.

9.9 AWD Management & Workforce Consultation

AW Demolition Ltd and any nominated subcontractors will carry out their statutory duties and consult with the workforce regarding standards of health and safety on a regular basis through regular documented meetings whereby any complaints will be investigated and worker involvement and suggestions that can lead to safer working practices are encouraged and rewarded. AWD operate an open door policy whereby any issue can be reported anonymously if necessary to any member of management.

9.10 Daily Activity Briefings (DABS)

AW Demolition Ltd operates a policy of active safety management involving all operatives in brief daily site safety meetings.

The meeting is held by the Site Manager / Supervisor each morning with all operatives / team leaders to co-ordinate the days planned activities, to focus on safety issues and discuss any lessons to be learnt from the previous day.

The items discussed in the briefing are recorded on a specific form and all attendees sign at the end of the meeting.

9.11 Neighbours & Local Residents

The site Manager / Supervisor will meet with the owners of nearby properties on a regular basis to keep them informed of works being undertaken and to liaise with them over any issues such as site access restrictions, temporary road closures etc.

A newsletter will be drafted on a regular basis which will be sent to neighbours and local residents keeping them informed of works being undertaken and advising them of any issues such as temporary road closures etc.

10.0 Accident & Emergency Procedures

10.1 Nearest Accident & Emergency Unit

The nearest accident and emergency unit is located 4.5 miles away at:

Salford Royal Infirmary
Stott Lane
Salford
M6 8HD

10.2 Emergency Plans

Emergency procedures will be developed specific for the contract and will include, but not limited to:

- Fire & evacuation plan
- Premature collapse
- Rescue of injured persons from height

Other site emergencies to plan for may include one or more of the following:

- Live services strike
- Accident / Injury
- Bomb threat
- Any other incident deemed an emergency by the site manager

The emergency arrangements for this project will be explained to inductees as part of the site induction and details posted on the site safety notice board

Any person who has been site inducted but does not work on the site on a day by day basis must report to the site manager who in turn will discuss any site changes made following the persons last visit to site.

The project will have a dedicated first aid/ aider's and fire marshal/ marshals.

As fire arrangements are subject to change as the project progresses, either the site fire warden/site manager/safety coordinator have a duty to bring such changes to the attention of all persons on site. This is usually conveyed via tool box talks.

In the event that any emergency services need to attend site the site manager/ safety coordinator must make available the layout of the building/ site, current fire escape routes and details of any stored flammable product on site.

Periodically, fire evacuation tests will be carried out by the site manager/ safety coordinator. Persons found not to be cooperating in evacuating the building/site will be viewed as serious misconduct and dealt with accordingly to prevent re occurrence.

For the benefit of the soft strip works and due to the scale of the building, Fire Doors will remain in place on evacuation staircases for the duration so as to retain a safe means of escape should there be a fire.

10.3 Implementation of Plans In Emergency Situation

In case of an emergency the following method will be adopted:

- The person discovering the incident will raise the alarm as per the specific emergency plan.
- In the event of an incident/accident and on hearing the onsite warning signal, all personnel will assemble at their designated assembly point as detailed in the plan, unless stated otherwise this will be the car parking area.
- The site manager or his designated representatives will conduct a head count and if necessary mobilise an emergency rescue team to look for unaccounted persons. This will only be brought into operation once the risk of further accidents has been established and it is considered safe to enter the accident/ working zone.
- The site manager or his designated representative will then determine the nature of the situation and any possible causalities then telephone the emergency services as required - **999**
- The site manager or his designated representative shall arrange safe access and egress for emergency vehicles if required.

10.4 Accident Reporting & Investigation

All accidents on site must be reported, even if no medical attention is given, this includes delivery drivers and visitors. After such an event the following procedure will be adopted:

- The site manager will inform all pertinent persons as detailed in the accident report procedure together with the CDM coordinator and client.
- Following an accident or dangerous occurrence a complete investigation will be carried out by the site manager and or his designated representative/ representatives.
- The site manager shall use the accident reporting procedures accordingly, advising the Managing Director and company health and safety advisor where appropriate so that AW Demolition Ltd are compliant with RIDDOR;2013.

- The site manager will oversee all entries made in the site accident book which shall be kept in the site office.
- Reporting and investigation be conducted in accordance with the procedures highlighted in RIDDOR;2013.
 - Investigation
 - Conclusion
 - Revised risk assessment
 - Stand-down
 - Tool box talks (All sites and company interest locations)
- The HSE will be informed using the appropriate form and using the incident contact centre web site (if RIDDOR)

11.0 Monitoring, Auditing & Review

11.1 Introduction

The monitoring, auditing and reviewing of health and safety performance will be carried out in accordance with our policies and procedures.

11.2 Monitoring

11.2.1 Personnel Health Surveillance

Employees will be subject to different types of personal health surveillance dependent upon their job role e.g. lead in blood monitoring for burning operatives, fit for work for machine operators.

11.2.2 Noise

Noise monitoring will be carried out both on a personal level and background / site perimeter basis to ensure the operatives are provided with the correct PPE and that no-one else is exposed to levels requiring PPE.

11.2.3 Emissions

Activities that generate dust etc will be visually monitored and recorded throughout the day. Where necessary, specialist consultants will be employed to carry out specific measured tests.

11.2.4 COSHH (Control of Substances Hazardous to Health)

Where employees are subject to hazardous substances personal monitoring will be carried out to ensure the methods of work, PPE and RPE issued reduced the risks to the lowest practical level. Such monitoring will include the provision of gas detection monitors and exposure monitoring when removing asbestos containing materials. Results of such tests will be recorded as required.

Should asbestos be encountered or surveyed within the structure a robust plan will be put in place in accordance with the Control of Asbestos Regulation (CAR) 2012 and current HSE and Industry ACOPS. Where asbestos proves to be of the unlicensed category then AWD will deal with this using their inhouse Cat B Asbestos Trained operatives working to a task specific set of RAMS. However, should the works be Licensable then a specialist contractor will be employed and works will be carried out under the relevant HSE Licence and ASB5. Any ACM's removed from site will be placed in a sealed/lined skip/van and disposed of at a licenced landfill facility.

11.2.5 Daily Inspections

The Site Manager / Supervisor will constantly monitor the performance of employees and activities as the work progresses together with checks of plant and equipment etc. They will record all inspections and issues of concern / intervention where they have found bad practice or breach of regulation on the appropriate report e.g. near miss, accident book etc. Recording such information will allow them to be reviewed as and when necessary.

11.3 Auditing

11.3.1 AWD Site Audits

Site audits will be carried out at least monthly by the Health & Safety Director or his nominee. The site audit will take encompass all health and safety aspects of the works in detail and records the severity of the non-compliant issue. A percentage rating will be generated on completion of the audit.

The auditor will stop the work if he has any serious concerns regarding health and safety issues found until they are rectified. Otherwise, the audit results will be fed into the health and safety performance review system whereby the performance of the Site Manager / Supervisor is recorded.

11.3.2 Independent Site Audits

AWD are members of several independent trade associations and as such are subject to independent auditing also. The results and findings of such objects will also be fed into our health and safety performance review system.

11.3.3 Senior Management Tours

Although not given a performance score, sites are regularly visited by senior management, including the Managing Director, who carry a walk round of the site with regards health and safety. Any issues found on the tour are dealt with accordingly recorded on the appropriate report.

11.4 Review

11.4.1 Review of Site Audits

Site audits will generally be reviewed at site meetings and on a monthly basis as per AWD procedures. The main issues to be reviewed (if not already acted upon) are:

- Performance of Site Manager's / Supervisor
- Performance of Site Operatives
- Identification of training needs / requirements
- Shortfalls in information / Methods of Work provided
- Issues regarding standards of plant & equipment

11.4.2 Review of Key Performance Indicators

Key performance indicators will be continually recorded including, but not limited to:

- Total worked hours
- Minor Injuries
- Major / Reportable Injuries
- Near Misses
- Dangerous / Reportable Incidents
- Non-conformances
- Customer complaints
- Improvement & prohibition notices

The above information will be regularly reviewed at Management Meetings to ensure the health and safety targets set for the project are being met.

Review meetings will be documented and any further actions required will be assigned to the relevant person/s to complete.

11.4.3 Project Review

On completion of the project an internal review will take place to assess the standards set compared with those actually achieved so that shortcomings can be addressed during future projects.

Throughout the project and again on completion, each subcontractor used is assessed and determine not only the quality of work produced but also the co-operation and attention actually given to safety compared with standards set out in this plan.

12.0 Health & Safety File

12.1 Arrangements For The Provision of Information

Arrangements will be made by AW Demolition Ltd and any consultants that it employs, to pass on all relevant information to the CDMC for inclusion in the handover file.

Information for the health and safety file will be collated on a daily basis and is to include, but not limited to:

- Information on hazards such as asbestos, chemicals etc
- Information on buried services etc
- Certificates etc confirming the removal of hazardous materials
- Waste consignment notes for the disposal of hazardous materials

Appendix 1

Site Plan

Appendix 2

RAMS Issue & Control Sheet

RAMS– Issue & Control Record

When a new / revised risk assessment and method statement is issued a record of it is to be recorded both on the most recent electronic version, and on the site copy, of the health & safety plan. Previous versions listed are to be recorded when superseded.

Ref. & Version	RAMS Title	Building Reference	Date Superseded
R0	Demolition and Soft Strip	Premier Inn	

Appendix 3

Emergency Procedure Issue & Control Sheet

Emergency Procedures – Issue & Control Record

When a new / revised emergency procedure is issued a record of it is to be recorded both on the most recent electronic version, and on the site copy, of the health & safety plan. Previous versions listed are to be recorded when superseded.

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Appendix 4

Traffic Management Plan Issue & Control Sheet

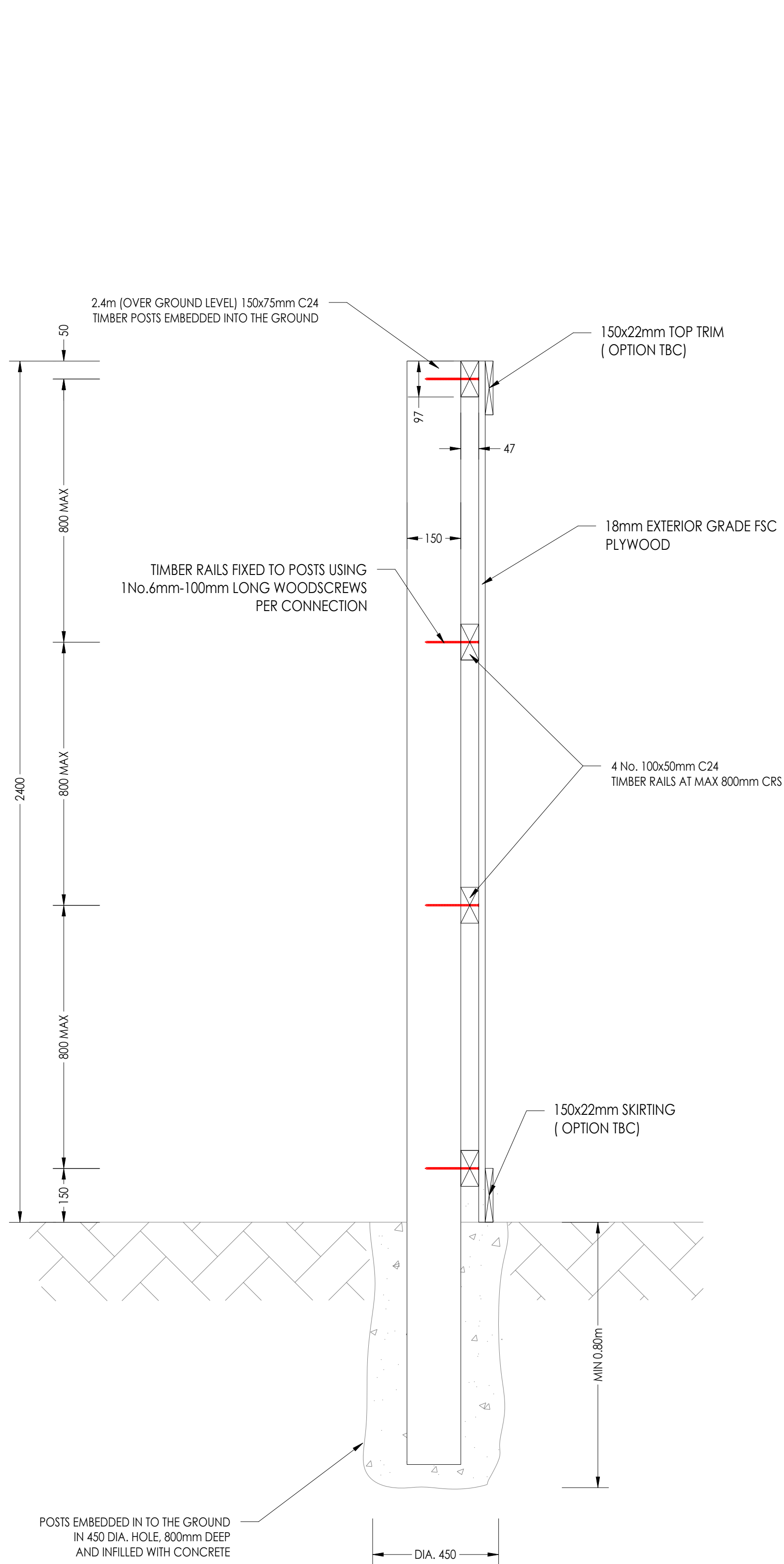
Traffic Management Plan – Issue & Control Record

When a new / revised traffic plan is issued a record of it is to be recorded both on the most recent electronic version, and on the site copy, of the health & safety plan. Previous versions listed are to be recorded when superseded.

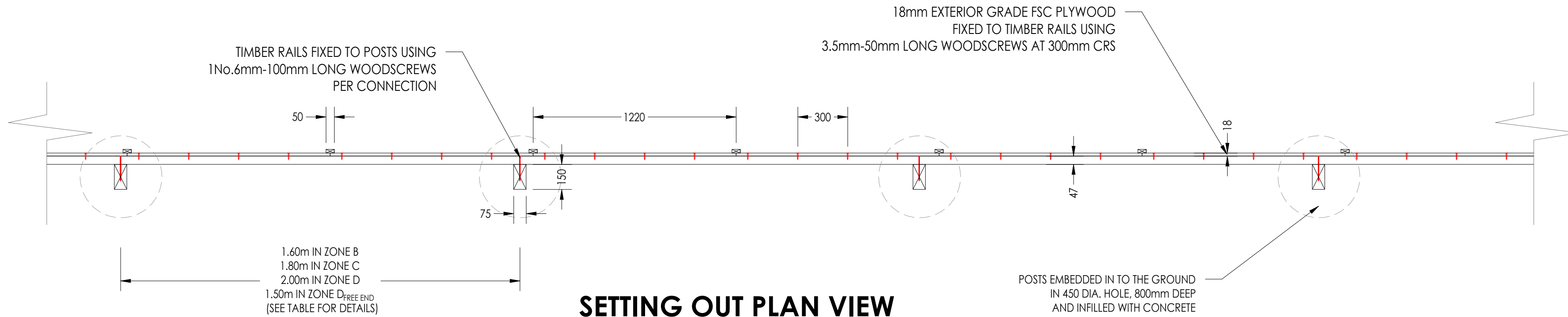
Ref. & Version	Traffic Management Plan	Area	Date Superseded
R0	TM Plan	Premier Inn	

Appendix 5

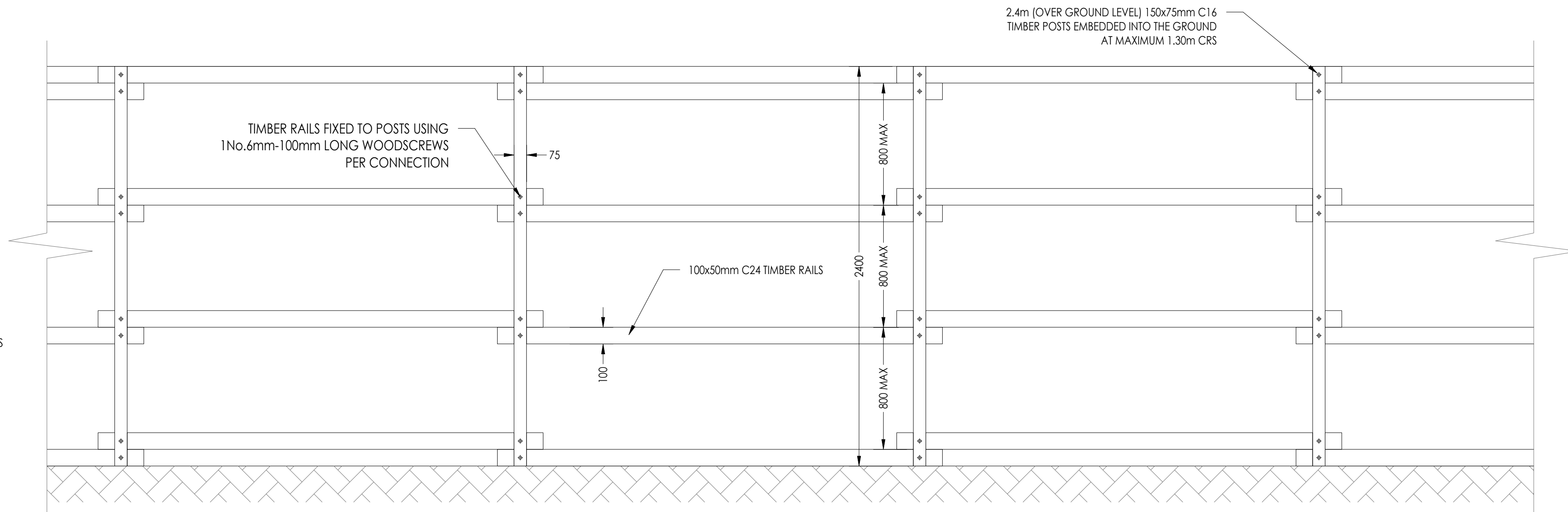
Hoarding Design



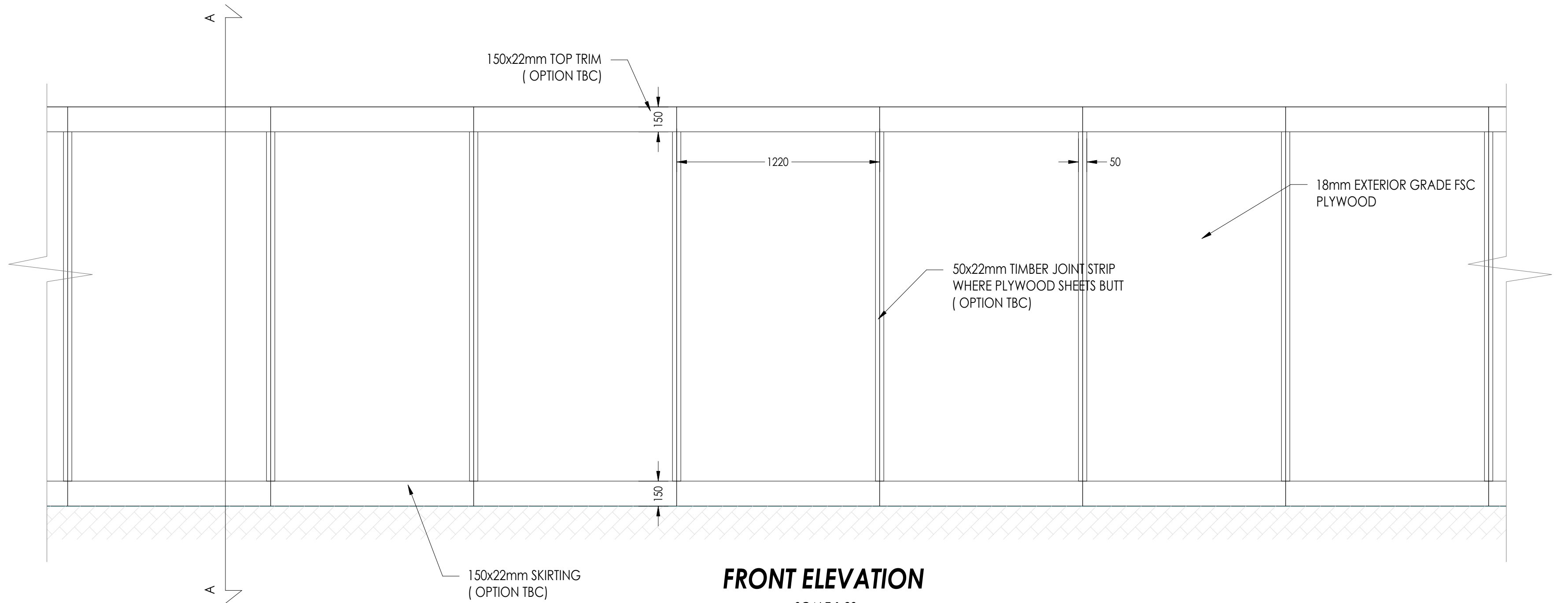
SECTION A-A
SCALE 1:10



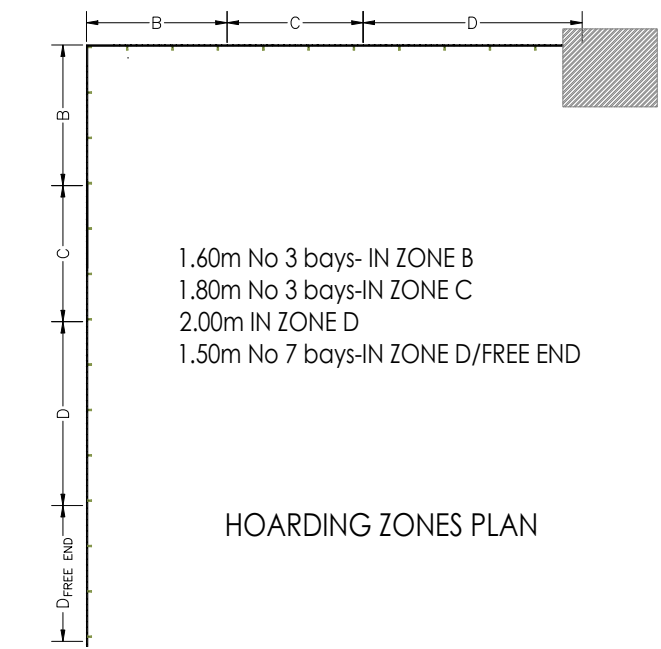
SETTING OUT PLAN VIEW
SCALE 1:10



SETTING OUT ELEVATION
SCALE 1:20



FRONT ELEVATION
SCALE 1:20



HOARDING ZONES PLAN

POST CENTRES FOR AVERAGE QUALITY OF THE GROUND .

Classification	Quality of the ground	G (kN/m2)
Good	Compact, well graded sand and gravel, hard clay, well-graded fine and coarse sand, decomposed granite rock and soil Good soils drain well	630
Average	Compact fine sand, medium clay, compacted well-drained sandy loam, loose coarse sand and gravel. Average soils drain sufficiently well that water does not stand on the surface.	390
Poor	Soft clay, clay loam, poorly compacted sands, clays containing a large amount of silt and vegetable matter, and made-up ground. Includes site placed backfill unless fully compacted. Poor soils are normally wet and have poor drainage	230

HOARDING IS NOT DESIGNED TO RESIST DYNAMIC VEHICLE IMPACT LOAD. HOARDING NEED TO BE SECURED BY SUITABLE TRAFFIC BARRIERS by CLIENT



GENERAL NOTES:

This drawing has been prepared from information supplied to us by our Client / the Contractor . All information within this drawing is subject to checking by our Client and the Contractor to ensure the requirements have been correctly interpreted. The Client & Contractor must satisfy themselves that all dimensions, setting out are as required and practicable.

Hoarding designed in accordance with the following codes.
BS EN 1991-1-4:2005
BS 6180:2011
TWF 2012/01 Hoardings/mv2020) - A Guide to good practice.

IMPOSED WIND LOADING
Full Wind Pressure kN/m² **0.252**

ALTERATIONS & CHANGES:
No change or alterations of use without prior confirmation from TWS Design Limited
The Client / Contractor must verify all site dimensions and notify of any discrepancies prior to erection.

RESIDUAL RISK NOTES:
It is not the policy of TWS Design Limited to prepare specific Designer Risk Assessments as design risks are identified within the drawing . Where risks cannot be eliminated and inherently reside within the scheme they are classified as 'Residual Risks' and will be identified with a warning triangle:

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DATE	REV	REVISION DESCRIPTION	DR	CHK

	TWS Design Limited 7, Bell Yard London WC2A 2JR Tel: 07565658751 www.twsdesign.co.uk info@twsdesign.co.uk
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CLIENT NAME
UK SITE HOARDING LTD.

PROJECT NAME
Manchester Premier Inn Medlock Street

DRAWING TITLE
2,4M HOARDING TO THE GROUND

DRAWING NUMBER	REVISION	SCALE	DESIGNER	DATE
3970-02	0	As Shown @ A1	MH	18/01/24
			TS	18/01/24

CALCULATION		JOB No:	3970-02
 TWS DESIGN temporary works engineers	PROJECT: Manchester Premier Inn Medlock Street	PREPARED by	MH
		CHECKED by	TS
	TITLE: 2,4M HOARDING TO THE GROUND	REVISION	C0
	CLIENT: UK SITE HOARDING LTD.	DATE:	18.01.2024

1. Project Description:

Calculations for 2.4m high hoarding secured to the ground. All showed on DWG 3970-02-0.

This structure has been designed in accordance with:

- BS EN 1991-1-4: 2005 - Wind Actions & TG20-13 Wind Guidance
- BS 5975: 2019 - Code of practice for temp. works procedures and the permissible stress design of falsework
- TWf 2012:01 (rev.2020) HOARDINGS: A guide to good practice

2. Structure geometry and loadings:

The minimum notional horizontal load applied to hoarding is:

$$H_z := 0.74 \frac{\text{kN}}{\text{m}} \quad h_z := 1.2\text{m} \quad \text{above the base.}$$

Hoarding dimensions:

$$\text{hoarding length: } l := 100\text{m}$$

$$\text{total length: } b := l = 100\text{m}$$

$$\text{bay width: } d := 25\text{m}$$

$$\text{hoarding height: } h := 2.4\text{m}$$

Site location data:

$$\text{altitude of the site: } A_1 := 142\text{m}$$

$$\text{distance to shoreline: } \text{dist}_{\text{shore}} := 90\text{km}$$

$$\text{distance inside town terrain: } \text{dist}_{\text{town}} := 1.3\text{km}$$

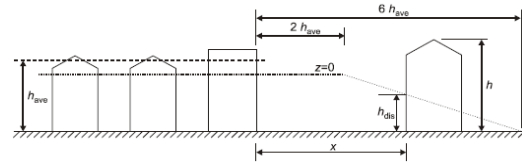
CALCULATION		JOB No:	3970-02
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Displacement height:

$$h_{ave} := 0\text{m}$$

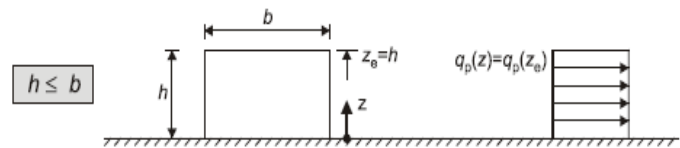
$$x := 0\text{m}$$

$$h_{dis} = 0\text{m}$$



Reference height for Wind Calculation:

$$h = 2.4\text{m} < b = 100\text{m}$$



reference height: $z_e := h = 2.4\text{m}$

Fundamental value of basic wind velocity:

fundamental value of basic wind
velocity before correction:

$$v_{b.m} := 21.5 \frac{\text{m}}{\text{s}} \quad (\text{Figure NA.1})$$

altitude factor: $c_{alt} = 1.142$

$$v_{b.0} := v_{b.m} \cdot c_{alt} = 24.553 \frac{\text{m}}{\text{s}}$$

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The basic wind velocity:

probability factor: $c_{\text{prob}} := 0.83$ (for two-year return time)

directional factor: $c_{\text{dir}} := 1.0$

season factor: $c_{\text{season}} := 1.0$

$$v_b := c_{\text{prob}} \cdot c_{\text{dir}} \cdot c_{\text{season}} \cdot v_{b,0} = 20.379 \frac{\text{m}}{\text{s}}$$

Basic velocity pressure: $\rho := 1.226 \frac{\text{kg}}{\text{m}^3}$ air density (NA.2.18):

$$q_{bv} := \frac{1}{2} \cdot \rho \cdot v_b^2 = 0.255 \cdot \text{kPa}$$

exposure factor: $c_e := 1.5$ (Figure NA.7)

exposure factor
for town terrain: $c_{e,T} := 0.66$ (Figure NA.8)

FULL WIND $q_p := c_e \cdot c_{e,T} \cdot q_{bv} = 0.252 \cdot \text{kPa}$

WORKING WIND $q_{p,\text{work}} := 0.2 \text{kPa}$

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Wind pressure on surfaces - free-standing wall:

solidity ratio: $sr := 1$

return corners: YES

length to height ratio: $\frac{l}{h} = 41.667$

Table 7.9 — Recommended pressure coefficients $c_{p,net}$ for free-standing walls and parapets

Solidity	Zone	A	B	C	D
$\varphi = 1$	Without return corners	$l/h \leq 3$	2,3	1,4	1,2
		$l/h = 5$	2,9	1,8	1,2
		$l/h \geq 10$	3,4	2,1	1,2
	with return corners of length $\geq h$ ^a		2,1	1,8	1,4
$\varphi = 0,8$			1,2	1,2	1,2

^a Linear interpolation may be used for return corner lengths between 0,0 and h

Zone A:

$$c_{pe.net.A} = 2.1$$

$$W_A := q_p \cdot c_{pe.net.A} = 0.529 \cdot \text{kPa}$$

$$W_{A.w} := q_{p.work} \cdot c_{pe.net.A} = 0.42 \cdot \text{kPa}$$

Zone B:

$$c_{pe.net.B} = 1.8 \quad (\text{from table 7.9})$$

$$W_B := q_p \cdot c_{pe.net.B} = 0.454 \cdot \text{kPa}$$

$$W_{B.w} := q_{p.work} \cdot c_{pe.net.B} = 0.36 \cdot \text{kPa}$$

Zone C:

$$c_{pe.net.C} = 1.4 \quad (\text{from table 7.9})$$

$$W_C := q_p \cdot c_{pe.net.C} = 0.353 \cdot \text{kPa}$$

$$W_{C.w} := q_{p.work} \cdot c_{pe.net.C} = 0.28 \cdot \text{kPa}$$

Zone D:

$$c_{pe.net.D} = 1.2 \quad (\text{from table 7.9})$$

$$W_D := q_p \cdot c_{pe.net.D} = 0.302 \cdot \text{kPa}$$

$$W_{D.w} := q_{p.work} \cdot c_{pe.net.D} = 0.24 \cdot \text{kPa}$$

Zone D_{FREE}:

$$c_{pe.net.Dfe} := 2.1 \quad (\text{from table 7.9})$$

$$W_{D.fe} := q_p \cdot c_{pe.net.Dfe} = 0.529 \cdot \text{kPa}$$

$$W_{Dfe.w} := q_{p.work} \cdot c_{pe.net.Dfe} = 0.42 \cdot \text{kPa}$$

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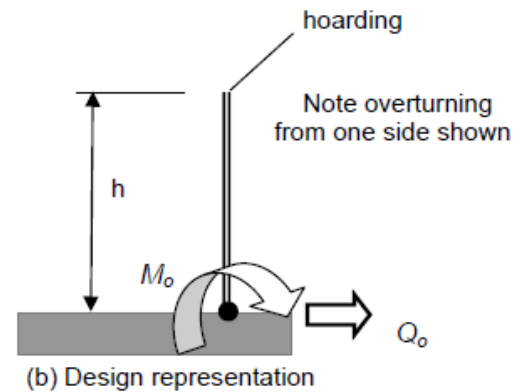
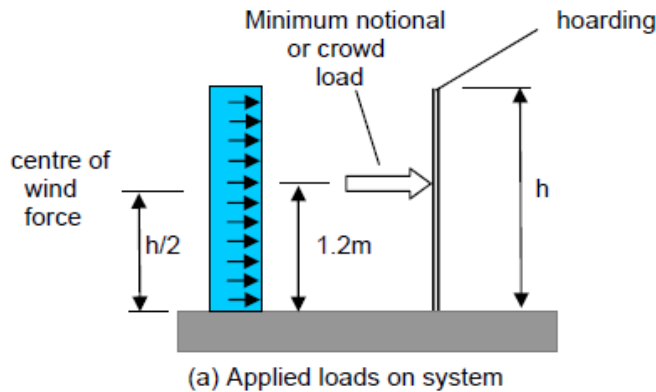
3. Hoarding elements design:

Permissible Bending moment and Shear force

Post used: 75x150mm C24 timber

$$M_{Rd1} := 3.187 \text{ kNm} \quad Q_{Rd1} := 8.39 \text{ kN}$$

(see app. A)



Load cases: L1: Full Wind, LC2: Working Wind+ Lateral Load

Zone B:

Overturning moment about base per m run of hoarding:

$$M_B := \max \left[\left(W_B \cdot h \right) \cdot \frac{h}{2}, \left(W_{B.w} \cdot h \right) \cdot \frac{h}{2} + H_Z \cdot h_Z \right] = 1.925 \cdot \frac{\text{kNm}}{\text{m}}$$

Shear force in base per m run of hoarding:

$$Q_B := \max \left(W_B \cdot h, W_{B.w} \cdot h + H_Z \right) = 1.604 \cdot \frac{\text{kN}}{\text{m}}$$

Max. post CRS:

$$CRS_B := \min \left(\frac{M_{Rd1}}{M_B}, \frac{Q_{Rd1}}{Q_B} \right) = 1.656 \text{ m} \quad \text{CRS}_B := 1.6 \text{ m}$$

no. of bays: $n_B = 3$

Zone C:

Overturning moment about base per m run of hoarding:

$$M_C := \max \left[\left(W_C \cdot h \right) \cdot \frac{h}{2}, \left(W_{C.w} \cdot h \right) \cdot \frac{h}{2} + H_Z \cdot h_Z \right] = 1.694 \cdot \frac{\text{kNm}}{\text{m}}$$

Shear force in base per m run of hoarding:

$$Q_C := \max \left(W_C \cdot h, W_{C.w} \cdot h + H_Z \right) = 1.412 \cdot \frac{\text{kN}}{\text{m}}$$

Max. post CRS:

$$CRS_C := \min \left(\frac{M_{Rd1}}{M_C}, \frac{Q_{Rd1}}{Q_C} \right) = 1.881 \text{ m} \quad \text{CRS}_C := 1.8 \text{ m}$$

no. of bays: $n_C = 3$

Zone D:

Overturning moment about base per m run of hoarding:

$$M_D := \max \left[\left(W_D \cdot h \right) \cdot \frac{h}{2}, \left(W_{D.w} \cdot h \right) \cdot \frac{h}{2} + H_Z \cdot h_Z \right] = 1.579 \cdot \frac{\text{kNm}}{\text{m}}$$

Shear force in base per m run of hoarding:

$$Q_D := \max \left(W_D \cdot h, W_{D.w} \cdot h + H_Z \right) = 1.316 \cdot \frac{\text{kN}}{\text{m}}$$

Max. post CRS:

$$CRS_D := \min \left(\frac{M_{Rd1}}{M_D}, \frac{Q_{Rd1}}{Q_D} \right) = 2.018 \text{ m} \quad \text{CRS}_D := 2.0 \text{ m}$$

no. of bays: remainder

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Zone D_{FREE END}:

Overturning moment about base per m run of hoarding:

$$M_{D.fe} := \max \left[(W_{D.fe} \cdot h) \cdot \frac{h}{2}, (W_{Dfe.w} \cdot h) \cdot \frac{h}{2} + H_z \cdot h_z \right] = 2.098 \cdot \frac{\text{kNm}}{\text{m}}$$

Shear force in base
per m run of hoarding:

$$Q_{D.fe} := \max (W_{D.fe} \cdot h, W_{Dfe.w} \cdot h + H_z) = 1.748 \cdot \frac{\text{kN}}{\text{m}}$$

Max. possible post CRS:

$$CRS_{D.fe} := \min \left(\frac{M_{Rd1}}{M_{D.fe}}, \frac{Q_{Rd1}}{Q_{D.fe}} \right) = 1.519 \text{ m}$$

$$CRS_{D.fe} := 1.5 \text{ m}$$

no. of bays: $n_{Dfe} = 7$

4. Horizontal rails design:

Permissible Bending moment and Shear force

Rails used: 100x50mm C24 timber beam

$$M_{Rd2} := 0.512 \text{ kNm}$$

$$Q_{Rd2} := 3.73 \text{ kN}$$

No. of rails used: $n := 4$

(see app. A)

Calculated rails centres: $CRS := \frac{h}{n-1} = 0.8 \text{ m}$

The design assumption for worst case for one central rail is either full wind or working wind with min. notional horizontal load applied to a single rail.

Max. linear loads on a single rail in different wind zones:

$$q_{Br} := \max (W_B \cdot CRS, W_{B.w} \cdot CRS + H_z) = 1.028 \cdot \frac{\text{kN}}{\text{m}}$$

$$q_{Cr} := \max (W_C \cdot CRS, W_{C.w} \cdot CRS + H_z) = 0.964 \cdot \frac{\text{kN}}{\text{m}}$$

$$q_{Dr} := \max (W_D \cdot CRS, W_{D.w} \cdot CRS + H_z) = 0.932 \cdot \frac{\text{kN}}{\text{m}}$$

$$q_{Dfer} := \max (W_{D.fe} \cdot CRS, W_{Dfe.w} \cdot CRS + H_z) = 1.076 \cdot \frac{\text{kN}}{\text{m}}$$

Extreme bending moment values for different wind zones:

$$M_{Br} := 0.125 \cdot q_{Br} \cdot CRS^2 = 0.329 \cdot \text{kNm}$$

$$M_{Cr} := 0.125 \cdot q_{Cr} \cdot CRS^2 = 0.39 \cdot \text{kNm}$$

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$$M_{Dr} := 0.125 \cdot q_{Dr} \cdot CRS_D^2 = 0.466 \cdot \text{kNm}$$

Moment of resistance:

$$M_{Rd2} = 0.512 \cdot \text{kNm}$$

$$M_{Dfer} := 0.125 \cdot q_{Dfer} \cdot CRS_{D.fe}^2 = 0.303 \cdot \text{kNm}$$

hence = "PASS"

Extreme shear force values for different wind zones:

$$Q_{Br} := 0.625 \cdot q_{Br} \cdot CRS_B = 1.028 \text{ kN}$$

$$Q_{Cr} := 0.625 \cdot q_{Cr} \cdot CRS_C = 1.085 \text{ kN}$$

$$Q_{Dr} := 0.625 \cdot q_{Dr} \cdot CRS_D = 1.165 \text{ kN}$$

Allowable shear force:

$$Q_{Rd2} = 3.73 \text{ kN}$$

$$Q_{Dfer} := 0.625 \cdot q_{Dfer} \cdot CRS_{D.fe} = 1.009 \text{ kN}$$

hence = "PASS"

5. Face material design:

Permissible Bending moment and Shear force

Cover material used: 18mm plywood

$$M_{Rd2} := 0.456 \frac{\text{kNm}}{\text{m}} \quad Q_{Rd2} := 6.34 \frac{\text{kN}}{\text{m}}$$

$$Q_{fply} := \max \left(0.5 \cdot 1.5 \frac{\text{kN}}{\text{m}^2} \cdot CRS, 0.5 W_{B.w} \cdot CRS + 0.5 \cdot H_Z \right) = 0.6 \cdot \frac{\text{kN}}{\text{m}}$$

$$M_{fply} := \max \left(0.125 \cdot 1.5 \frac{\text{kN}}{\text{m}^2} \cdot CRS^2, 0.125 W_{B.w} \cdot CRS^2 + 0.25 \cdot H_Z \cdot CRS \right) = 0.177 \cdot \frac{\text{kNm}}{\text{m}}$$

hence = "PASS"

Design for worst case loading of either panel robustness loading of 1.5 kN/m² or the effect of the min. notional horizontal load mid-way between rail, face material simply supported.

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6. Connection of ply to rails:

For connection design wind in zone A should be considered.

Max. linear load on a single rail in wind zone A:

$$q_A := \max(W_A \cdot CRS, W_{A.w} \cdot CRS + H_z) = 1.076 \cdot \frac{\text{kN}}{\text{m}}$$

Screws used: 3.5mm wood screws, 50mm long

Basic withdrawal load per
mm of penetration:

Assumed screws centres: $crs_s := 300\text{mm}$

$$F_{\text{ww}} := 14.7 \frac{\text{N}}{\text{mm}}$$

Design factors: $K_{52} := 1.25$ (very short term loading) $K_{53} := 0.7$ (Class 3)

Point side penetration: $e_s := 50\text{mm} - 18\text{mm} = 32\text{mm}$

Permissible load per metre: $q_{Rd} := \frac{e_s \cdot F_{\text{ww}} \cdot K_{52} \cdot K_{53}}{crs_s} = 1.372 \cdot \frac{\text{kN}}{\text{m}} > q_A = 1.076 \cdot \frac{\text{kN}}{\text{m}}$

hence = "PASS"

7. Connection of rails to post:

$$CRS_A := CRS_B = 1.6\text{m}$$

Max. point load on a single post in wind zone A:

$$P_p := \max(W_A \cdot CRS, W_{A.w} \cdot CRS + H_z) \frac{CRS_A}{2} = 0.861 \cdot \text{kN}$$

Basic withdrawal load per
mm of penetration:

Screws used: 6mm wood screws, 100mm long

Assumed no. of screws: $N_s := 1$

$$F_{\text{ww}} := 22.1 \frac{\text{N}}{\text{mm}}$$

Design factors: $K_{52} := 1.25$ (very short term loading) $K_{53} := 0.7$ (Class 3)

Point side penetration: $e_{\text{ss}} := 100\text{mm} - 50\text{mm} = 50\text{mm}$

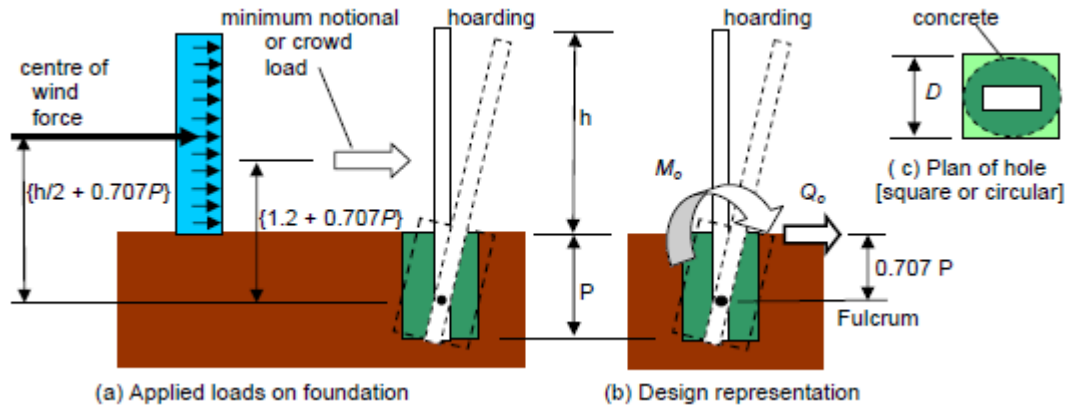
Permissible load per connect.: $P_{Rd} := N_s \cdot e_s \cdot F_{\text{ww}} \cdot K_{52} \cdot K_{53} = 0.967 \cdot \text{kN} > P_p = 0.861 \cdot \text{kN}$

hence = "PASS"

NOTE: The rails are not continuous past the post, hence the loaded length is halved

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8. Foundation design:



Max. overturning forces about post base:

$$Q_0 := \max(Q_B \cdot \text{CRS}_B, Q_C \cdot \text{CRS}_C, Q_D \cdot \text{CRS}_D, Q_{D.fe} \cdot \text{CRS}_{D.fe}) = 2.632 \cdot \text{kN}$$

$$M_0 := \max(M_B \cdot \text{CRS}_B, M_C \cdot \text{CRS}_C, M_D \cdot \text{CRS}_D, M_{D.fe} \cdot \text{CRS}_{D.fe}) = 3.158 \cdot \text{kNm}$$

Ground resistance moment:

$$\text{Minimum effective width of concreted foundation:} \quad D := 0.45\text{m}$$

$$\text{Planting depth of the post from ground level:} \quad P := 0.8\text{m}$$

$$\text{Ground factor (for average quality of the ground):} \quad G := 390 \frac{\text{kN}}{\text{m}^2} \quad (\text{TWf2012: 01, Table D1})$$

$$M_{\text{ground}} := \frac{G \cdot D \cdot P^3}{10\text{m}} = 8.986 \cdot \text{kNm}$$

Max. overturning moment about fulcrum point:

$$M := [M_0 + (0.707 \cdot Q_0 \cdot P)] \cdot 1.5 = 6.971 \cdot \text{kNm} < M_{\text{ground}} = 8.986 \cdot \text{kNm}$$

hence = "PASS"

(with 1.5 factor of safety)

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9. Design Summary:

1. Use **75x150 C24** constructional sawn timber posts at max. crs: **1.6m** (zone B - 3 bays), **1.8m** (zone C - 3 bays), **2.0m** (zone D - remainder), **1.5m** (zone D_{FREE END} - 7 bays)
2. Use **4No. 100x50 C24** constructional sawn timber rails at **800mm** centres;
3. Face material: **18mm Plywood**;
4. Use **3.5mm wood screws 50mm long** for the ply to rail connection at **300mm** centres;
5. Use **1No. 6mm wood screws 100mm g** per rail to post connection;
6. In case of good average conditions, posts to be embedded in to the ground in **450mm dia. hole, 800mm deep** and infilled with concrete.

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APPENDIX A

Allowable internal forces
for timber beams
(TWf20125:01)

75x150mm C24 timber posts

Geometry details:

$$a = 3 \cdot \text{in}$$

$$b = 6 \cdot \text{in}$$

Dimensions of cross-section:

$$A_s := a \cdot b = 112.5 \cdot \text{cm}^2$$

Section area:

$$I_y := \frac{a \cdot b^3}{12} = 2109.375 \cdot \text{cm}^4$$

Moment of inertia:

$$W_y := \frac{a \cdot b^2}{6} = 281.2 \cdot \text{cm}^3$$

Section modulus:

$$fZ = 7.5 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Bending stress parallel to grain}$$

$$qA = 0.71 \cdot \frac{\text{N}}{\text{mm}^2} \quad \begin{array}{l} \text{Shear stress parallel to grain} \\ \text{(service class 3)} \end{array}$$

$$E_{0.\text{mean}} = 8640 \cdot \frac{\text{N}}{\text{mm}^2} \quad \begin{array}{l} \text{Mean modulus of elasticity} \\ \text{(service class 3)} \end{array}$$

$$E_{\text{min}} = 5760 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Minimum modulus of elasticity:}$$

$$K_{2b} := 0.8 \quad \begin{array}{l} \text{Factor converting service classes 1 and 2 strength} \\ \text{classes to service class 3 (bending)} \end{array}$$

$$K_{2s} := 0.9 \quad \begin{array}{l} \text{Factor converting service classes 1 and 2 strength} \\ \text{classes to service class 3 (shear)} \end{array}$$

$$\text{Load sharing factor:} \quad K_8 = 1$$

$$\text{Duration of load factor:} \quad K_3 = 1.75$$

$$\text{Bearing stress factor:} \quad K_4 := 1.0$$

$$\text{Form factor:} \quad K_6 := 1.0$$

$$\text{Depth factor:} \quad K_7 = 1.079$$

PERMISSIBLE STRESSES

Shear load:

$$V_{\text{RdP}} := \frac{2}{3} qA \cdot A_s \cdot K_{2s} \cdot K_3 \cdot K_4 \cdot K_6 \cdot K_8 = 8.39 \cdot \text{kN}$$

$\frac{2}{3}$ FACTOR FOR RECTANGULAR
SECTION

Moment of resistance:

$$M_{\text{RdP}} := fZ \cdot W_y \cdot K_{2b} \cdot K_3 \cdot K_4 \cdot K_6 \cdot K_7 \cdot K_8 = 3.187 \cdot \text{kN} \cdot \text{m}$$

50x100mm C24 timber rails

Geometry details:

$$a = 4 \cdot \text{in}$$

$$b = 2 \cdot \text{in}$$

Dimensions of cross-section:

$$A_s := a \cdot b = 50 \cdot \text{cm}^2$$

Section area:

$$I_y := \frac{a \cdot b^3}{12} = 104.167 \cdot \text{cm}^4$$

Moment of inertia:

$$W_y := \frac{a \cdot b^2}{6} = 41.7 \cdot \text{cm}^3$$

Section modulus:

$$fZ = 7.5 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Bending stress parallel to grain}$$

$$qA = 0.71 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Shear stress parallel to grain (service class 3)}$$

$$E_{0.\text{mean}} = 8640 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Mean modulus of elasticity (service class 3)}$$

$$E_{\text{min}} = 5760 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Minimum modulus of elasticity:}$$

$$K_{2b} := 0.8 \quad \text{Factor converting service classes 1 and 2 strength classes to service class 3 (bending)}$$

$$K_{2s} := 0.9 \quad \text{Factor converting service classes 1 and 2 strength classes to service class 3 (shear)}$$

$$\text{Load sharing factor: } K_8 = 1$$

$$\text{Duration of load factor: } K_3 = 1.75$$

$$\text{Bearing stress factor: } K_4 := 1.0$$

$$\text{Form factor: } K_6 := 1.0$$

$$\text{Depth factor: } K_7 = 1.17$$

PERMISSIBLE STRESSES

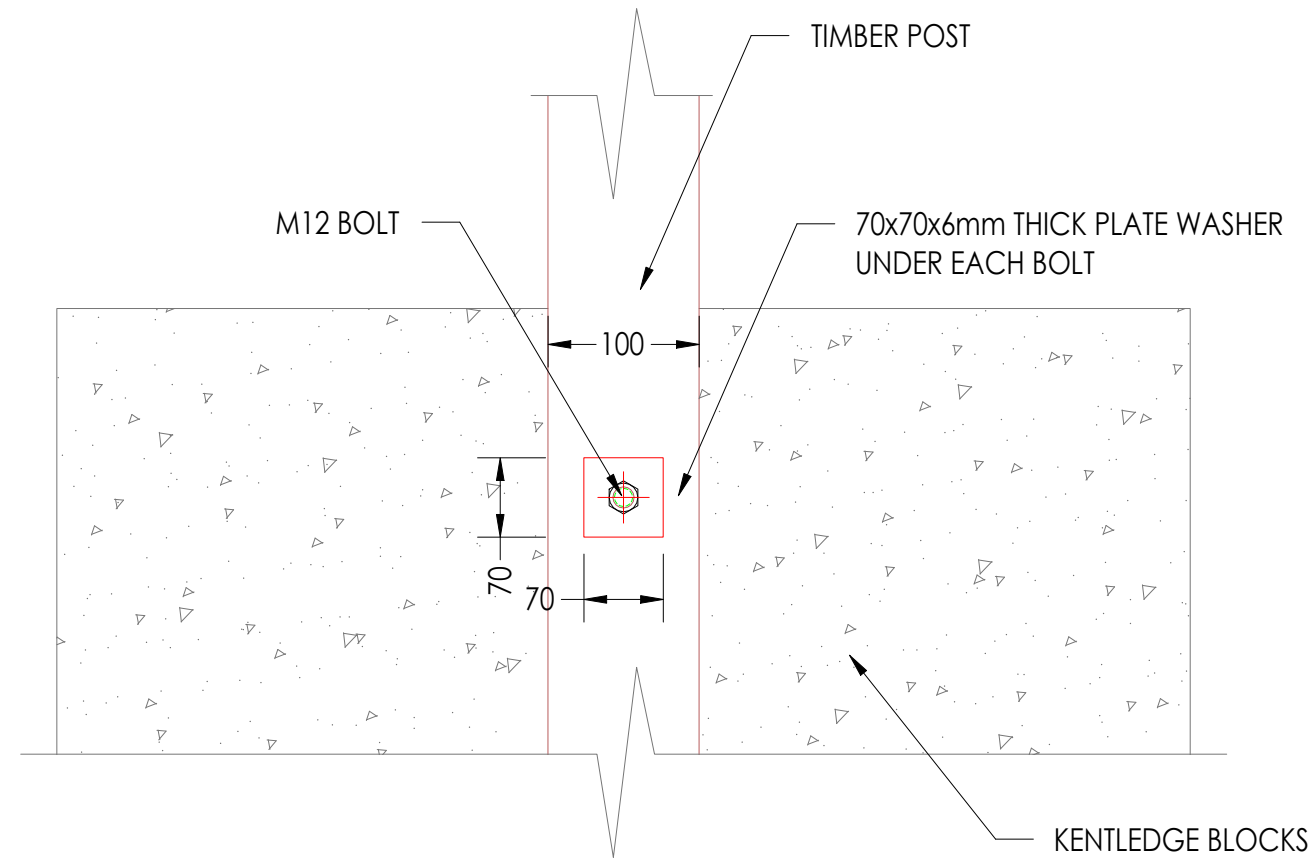
Shear load:

$$V_{RdP} := \frac{2}{3} qA \cdot A_s \cdot K_{2s} \cdot K_3 \cdot K_4 \cdot K_6 \cdot K_8 = 3.73 \cdot \text{kN}$$

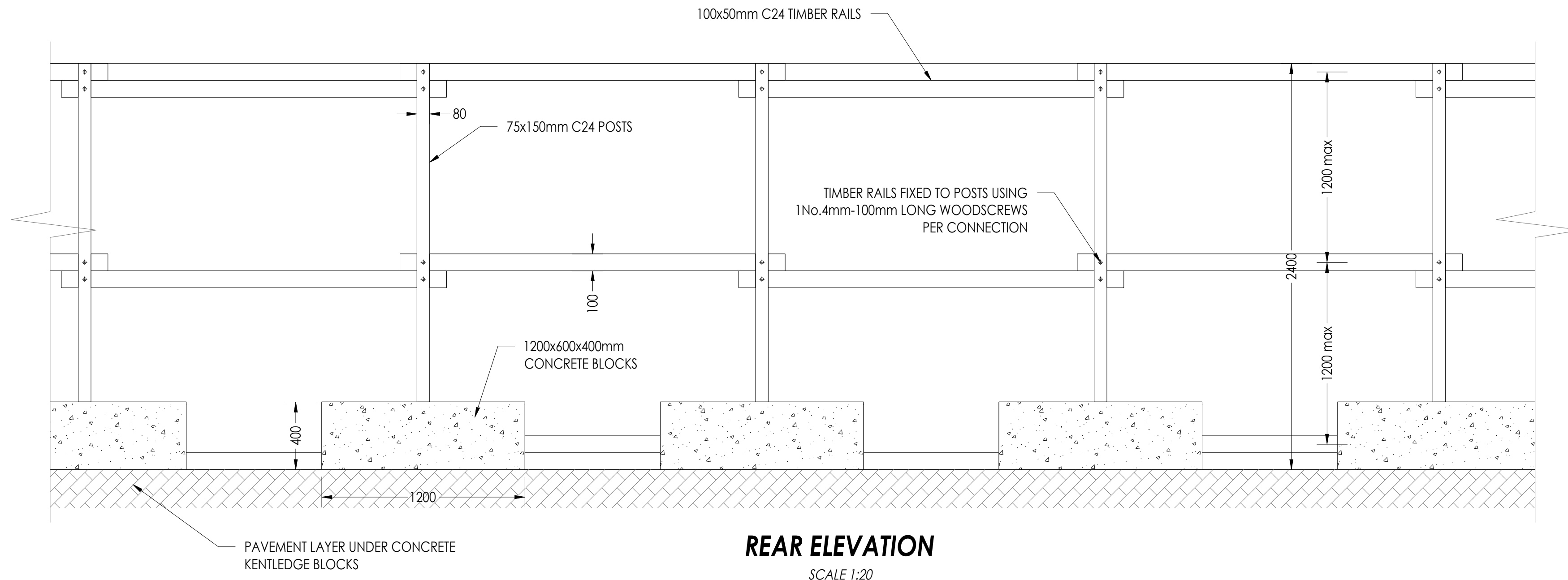
$\frac{2}{3}$ FACTOR FOR RECTANGULAR SECTION

Moment of resistance:

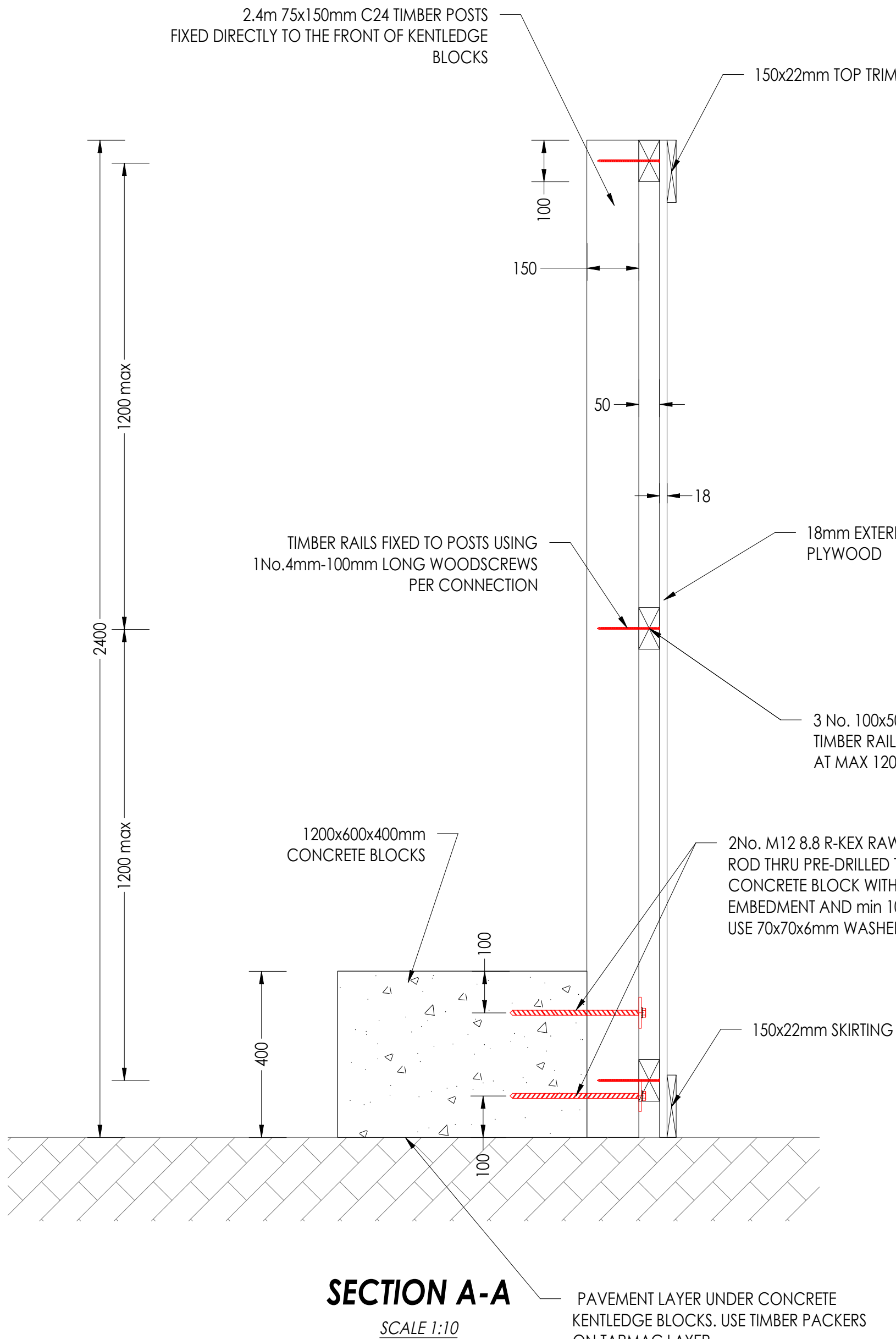
$$M_{RdP} := fZ \cdot W_y \cdot K_{2b} \cdot K_3 \cdot K_4 \cdot K_6 \cdot K_7 \cdot K_8 = 0.512 \cdot \text{kN} \cdot \text{m}$$



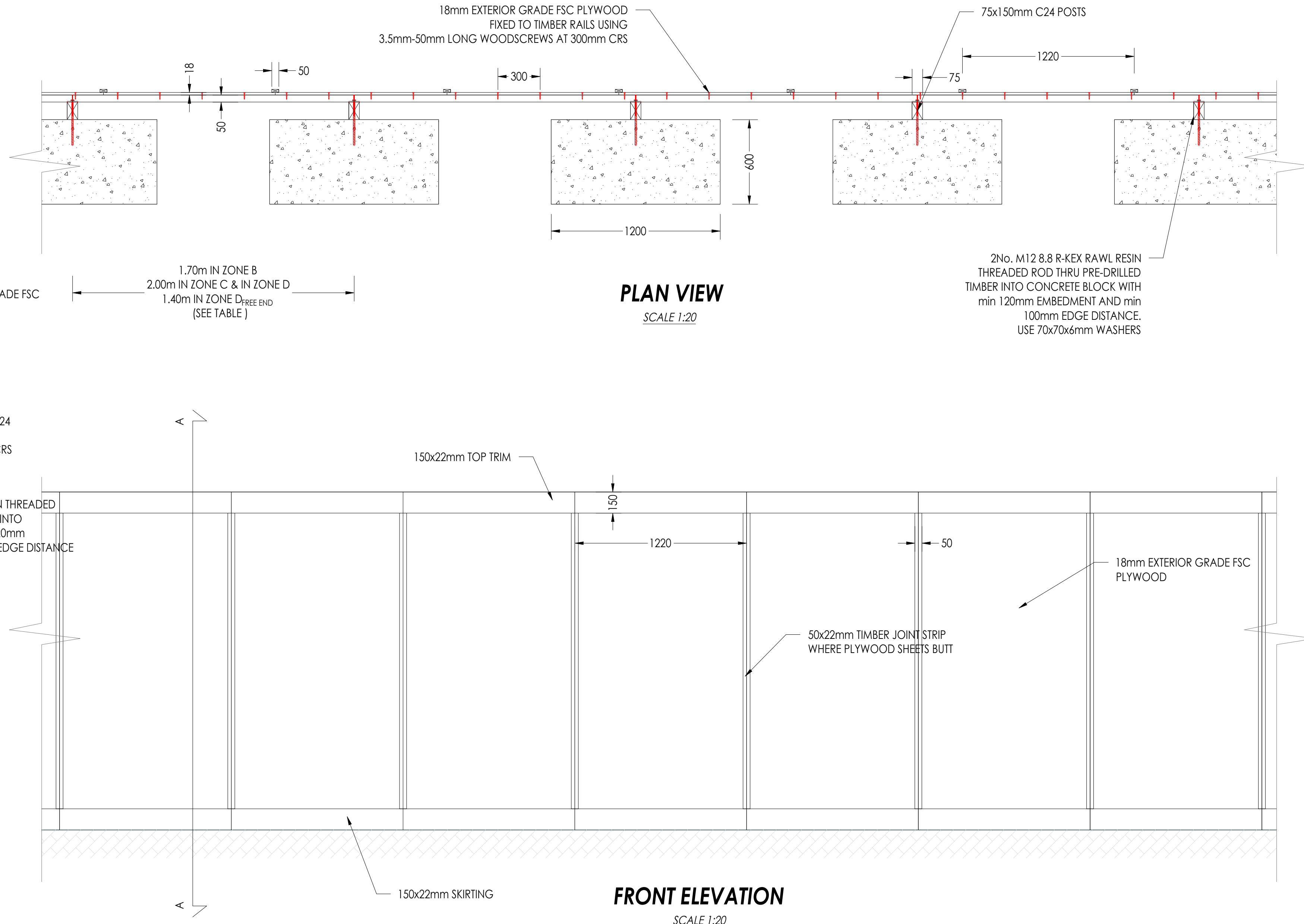
CONNECTION DETAIL
SCALE 1:5



REAR ELEVATION
SCALE 1:20

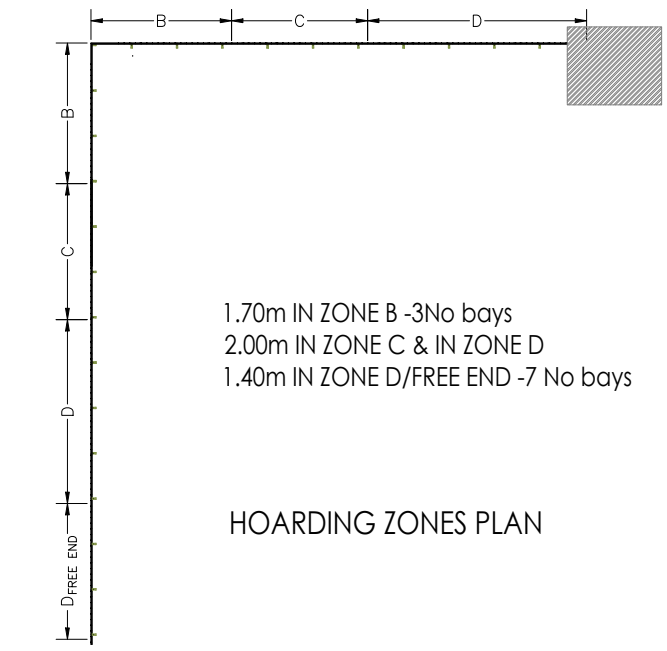


SECTION A-A
SCALE 1:10



PLAN VIEW
SCALE 1:20

FRONT ELEVATION
SCALE 1:20



HOARDING IS NOT DESIGNED TO RESIST DYNAMIC VEHICLE IMPACT LOAD. HOARDING NEED TO BE SECURED BY SUITABLE TRAFFIC BARRIERS by CLIENT



GENERAL NOTES:

This drawing has been prepared from information supplied to us by our Client / the Contractor. All information within this drawing is subject to checking by our Client and the Contractor to ensure the requirements have been correctly interpreted. The Client & Contractor must satisfy themselves that all dimensions, setting out are as required and practicable.

Hoarding designed in accordance with the following codes:
BS EN 1991-1-4:2005
BS 6180:2011
TWF 2012-01 Hoardings(rev2020) - A Guide to good practice.

IMPOSED WIND LOADING
Full Wind Pressure kN/m²: 0.233

ALTERATIONS & CHANGES:
No change or alterations of use without prior confirmation from TWS Design Limited
The Client / Contractor must verify all site dimensions and notify of any discrepancies prior to erection.

RESIDUAL RISK NOTES:
It is not the policy of TWS Design Limited to prepare specific Designer Risk Assessments as design risks are identified within the drawing. Where risks cannot be eliminated and inherently reside within the scheme they are classified as 'Residual Risk' and will be identified with a warning triangle:

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DATE	REV	REVISION DESCRIPTION	DR	CHK



TWS DESIGN
temporary works engineers

TWS Design Limited
7, Bell Yard
London
WC2A 2JR
Tel: 07565658751
www.twsdesign.co.uk
info@twsdesign.co.uk

CLIENT NAME
UK SITE HOARDING LTD.

PROJECT NAME
**MEDLOCK STREET
MANCHESTER M15 5FJ**

DRAWING TITLE
2,4M HOARDING TO THE BLOCKS

DRAWING NUMBER 4157-01	REVISION 0	SCALE As Shown @ A1	DESIGNER MH	DATE 19/01/24
			CHECKER TS	DATE 19/01/24

CALCULATION		JOB No:	4157-01
 TWS DESIGN temporary works engineers	PROJECT: MEDLOCK STREET, MANCHESTER M15 5FJ	PREPARED by	MH
		CHECKED by	TS
	TITLE: 2,4M HOARDING TO THE BLOCKS PARALLEL	REVISION	C0
	CLIENT: UK SITE HOARDING LTD.	DATE:	19.01.2024

1. Project Description:

Calculations for 2.4m high hoarding secured to kentledge blocks parallel. All showed on DWG 4157-01-0.

This structure has been designed in accordance with:

- BS EN 1991-1-4:2005 - Wind Actions & TG20-13 Wind Guidance
- BS 5975:2019 - Code of practice for temp. works procedures and the permissible stress design of falsework
- TWf 2012:01 HOARDINGS(rev2020): A guide to good practice

2. Structure geometry and loadings:

The minimum notional horizontal load applied to hoarding is:

$$H_z := 0.0 \frac{\text{kN}}{\text{m}} \quad h_z := 1.2\text{m} \quad \text{above the base.}$$

Hoarding dimensions:

hoarding length: $l_w := 100\text{m}$

total length: $b := l = 100\text{m}$

bay width: $d := 20\text{m}$

hoarding height: $h := 2.4\text{m}$

Site location data:

altitude of the site: $A_1 := 32\text{m}$

distance to shoreline: $\text{dist}_{\text{shore}} := 54\text{km}$

distance inside town terrain: $\text{dist}_{\text{town}} := 7\text{km}$

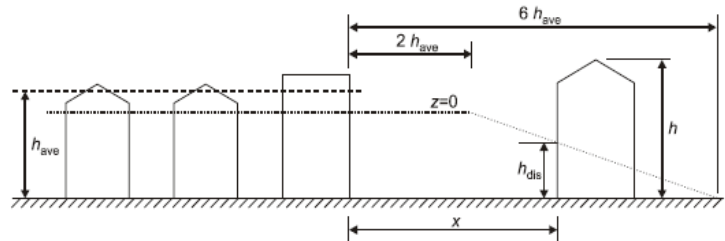
CALCULATION		JOB No:	4157-01
 TWS DESIGN temporary works engineers	PROJECT: MEDLOCK STREET, MANCHESTER M15 5FJ		PREPARED by MH
			CHECKED by TS
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	CLIENT: UK SITE HOARDING LTD.		DATE: 19.01.2024

Displacement height:

$$h_{ave} := 0\text{m}$$

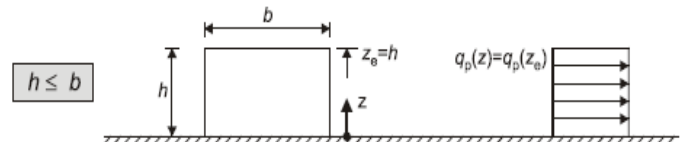
$$x := 0\text{m}$$

$$h_{dis} = 0\text{m}$$



Reference height for Wind Calculation:

$$h = 2.4\text{m} < b = 100\text{m}$$



reference height: $z_e := h = 2.4\text{m}$

Fundamental value of basic wind velocity:

fundamental value of basic wind
velocity before correction:

$$v_{b.m} := 22.5 \frac{\text{m}}{\text{s}} \quad (\text{Figure NA.1})$$

altitude factor: $c_{alt} = 1.032$

$$v_{b.0} := v_{b.m} \cdot c_{alt} = 23.22 \frac{\text{m}}{\text{s}}$$

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The basic wind velocity:

probability factor: $c_{\text{prob}} := 0.83$ (for two-year return time)

directional factor: $c_{\text{dir}} := 1.0$

season factor: $c_{\text{season}} := 1.0$

$$v_b := c_{\text{prob}} \cdot c_{\text{dir}} \cdot c_{\text{season}} \cdot v_{b,0} = 19.273 \frac{\text{m}}{\text{s}}$$

Basic velocity pressure: $\rho := 1.226 \frac{\text{kg}}{\text{m}^3}$ air density (NA.2.18):

$$q_{bv} := \frac{1}{2} \cdot \rho \cdot v_b^2 = 0.228 \cdot \text{kPa}$$

exposure factor: $c_e := 1.55$ (Figure NA.7)

exposure factor
for town terrain: $c_{e,T} := 0.66$ (Figure NA.8)

FULL WIND $q_p := c_e \cdot c_{e,T} \cdot q_{bv} = 0.233 \cdot \text{kPa}$

WORKING WIND $q_{p,\text{work}} := 0.2 \text{kPa}$

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Wind pressure on surfaces - free-standing wall:

solidity ratio: $sr := 1$

return corners: YES

length to height ratio: $\frac{l}{h} = 41.667$

Table 7.9 — Recommended pressure coefficients $c_{p,net}$ for free-standing walls and parapets

Solidity	Zone	A	B	C	D
$\varphi = 1$	Without return corners	$l/h \leq 3$	2,3	1,4	1,2
		$l/h = 5$	2,9	1,8	1,4
		$l/h \geq 10$	3,4	2,1	1,7
	with return corners of length $\geq h$ ^a		2,1	1,8	1,4
$\varphi = 0,8$			1,2	1,2	1,2

^a Linear interpolation may be used for return corner lengths between 0,0 and h

Zone A:

$c_{pe.net.A} = 2.1$ (from table 7.9)

$W_A := q_p \cdot c_{pe.net.A} = 0.489 \cdot \text{kPa}$

$W_{A.w} := q_{p.work} \cdot c_{pe.net.A} = 0.42 \cdot \text{kPa}$

Zone B:

$c_{pe.net.B} = 1.8$ (from table 7.9)

$W_B := q_p \cdot c_{pe.net.B} = 0.419 \cdot \text{kPa}$

$W_{B.w} := q_{p.work} \cdot c_{pe.net.B} = 0.36 \cdot \text{kPa}$

Zone C:

$c_{pe.net.C} = 1.4$ (from table 7.9)

$W_C := q_p \cdot c_{pe.net.C} = 0.326 \cdot \text{kPa}$

$W_{C.w} := q_{p.work} \cdot c_{pe.net.C} = 0.28 \cdot \text{kPa}$

Zone D:

$c_{pe.net.D} = 1.2$ (from table 7.9)

$W_D := q_p \cdot c_{pe.net.D} = 0.28 \cdot \text{kPa}$

$W_{D.w} := q_{p.work} \cdot c_{pe.net.D} = 0.24 \cdot \text{kPa}$

Zone D_{FREE}:

$c_{pe.net.Dfe} := 2.1$ (from table 7.9)

$W_{D.fe} := q_p \cdot c_{pe.net.Dfe} = 0.489 \cdot \text{kPa}$

$W_{Dfe.w} := q_{p.work} \cdot c_{pe.net.Dfe} = 0.42 \cdot \text{kPa}$

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3. Hoarding elements design:

Permissible Bending moment and Shear force

Post used: 75x150mm C24 timber beam

$$M_{R1} := 3.25 \text{ kNm}$$

$$Q_{R1} := 8.39 \text{ kN}$$

(see app. A)

Hoarding posts are fixed to Kentledge Blocks of dims:

$$H_b := 0.4 \text{ m} \quad - \text{ height of block}$$

$$W_b := 1.2 \text{ m} \quad - \text{ width of block}$$

$$L_b := 0.6 \text{ m} \quad - \text{ length of block (perp. to hoarding)}$$

$$N_b := 1 \quad - \text{ number of kentledge blocks in height}$$

$$\gamma_c := 24 \frac{\text{kN}}{\text{m}^3} \quad - \text{ concrete density}$$

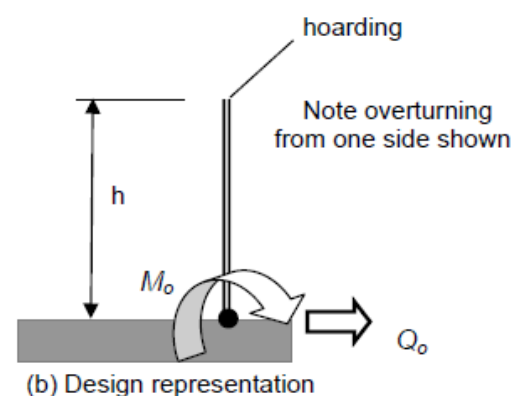
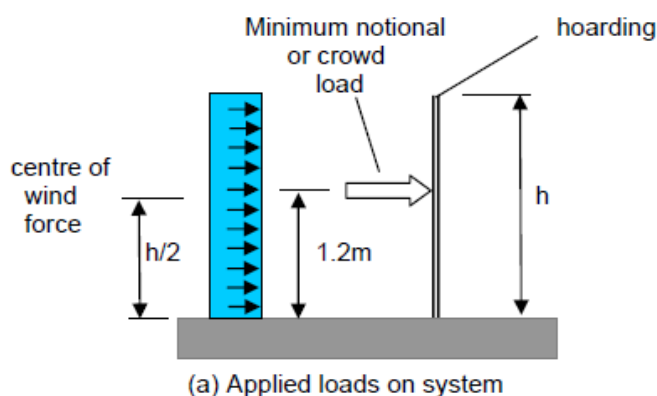
Total weight of block: $M_{\text{block}} := N_b (H_b \cdot W_b \cdot L_b) \cdot \gamma_c = 6.912 \text{ kN}$

Restoring Moment: $M_r := M_{\text{block}} \cdot (0.5L_b + 150 \text{ mm}) = 3.11 \cdot \text{kNm}$

Post cantilever length: $p := h - (N_b \cdot H_b - 0.125 \text{ m}) = 2.125 \text{ m}$

Notional load lever arm: $p_z := \max(p + h_z - h, 0 \text{ m}) = 0.925 \text{ m}$

Load cases: *L1: Full Wind, L2: Working Wind + Lateral Load*



$$\gamma_F := 1.5 \quad - \text{ factor of safety for destabilizing variable actions}$$

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Zone B:

Overturning moment about base per m run of hoarding:

$$M_B := \max \left[(W_B \cdot h) \cdot \frac{h}{2}, (W_{B.w} \cdot h) \cdot \frac{h}{2} + H_Z \cdot h_Z \right] = 1.207 \cdot \frac{\text{kNm}}{\text{m}}$$

Max. bending moment in post per m run of hoarding:

$$M_{P.B} := \max \left[(W_B \cdot p) \cdot \frac{p}{2}, (W_{B.w} \cdot p) \cdot \frac{p}{2} + H_Z \cdot p_Z \right] = 0.947 \cdot \frac{\text{kNm}}{\text{m}}$$

Max. shear force in post per m run of hoarding:

$$Q_{P.B} := \max (W_B \cdot p, W_{B.w} \cdot p + H_Z) = 0.891 \cdot \frac{\text{kN}}{\text{m}}$$

Max. blocks CRS:

$$CRS_{B\text{block}} := \min \left(\frac{M_T}{\gamma_F \cdot M_B} \right) = 1.717 \text{ m}$$

$$CRS_B := 1.7 \text{ m}$$

Max. posts CRS:

$$CRS'_{B\text{Post}} := \min \left(\frac{M_{R1}}{M_{P.B}}, \frac{Q_{R1}}{Q_{P.B}} \right) = 3.433 \text{ m} \quad \text{no. of bays: } N_B = 3$$

Zone C:

Overturning moment about base per m run of hoarding:

$$M_C := \max \left[(W_C \cdot h) \cdot \frac{h}{2}, (W_{C.w} \cdot h) \cdot \frac{h}{2} + H_Z \cdot h_Z \right] = 0.939 \cdot \frac{\text{kNm}}{\text{m}}$$

Max. bending moment in post per m run of hoarding:

$$M_{P.C} := \max \left[(W_C \cdot p) \cdot \frac{p}{2}, (W_{C.w} \cdot p) \cdot \frac{p}{2} + H_Z \cdot p_Z \right] = 0.736 \cdot \frac{\text{kNm}}{\text{m}}$$

Max. shear force in post per m run of hoarding:

$$Q_{P.C} := \max (W_C \cdot p, W_{C.w} \cdot p + H_Z) = 0.693 \cdot \frac{\text{kN}}{\text{m}}$$

Max. blocks CRS:

$$CRS_{C\text{block}} := \min \left(\frac{M_T}{\gamma_F \cdot M_C} \right) = 2.208 \text{ m}$$

$$CRS_C := 2.0 \text{ m}$$

Max. posts CRS:

$$CRS'_{C\text{Post}} := \min \left(\frac{M_{R1}}{M_{P.C}}, \frac{Q_{R1}}{Q_{P.C}} \right) = 4.414 \text{ m} \quad \text{no. of bays: } N_C = 3$$

Zone D:

Overturning moment about base per m run of hoarding:

$$M_D := \max \left[(W_D \cdot h) \cdot \frac{h}{2}, (W_{D.w} \cdot h) \cdot \frac{h}{2} + H_Z \cdot h_Z \right] = 0.805 \cdot \frac{\text{kNm}}{\text{m}}$$

Max. bending moment in post per m run of hoarding:

$$M_{P.D} := \max \left[(W_D \cdot p) \cdot \frac{p}{2}, (W_{D.w} \cdot p) \cdot \frac{p}{2} + H_Z \cdot p_Z \right] = 0.631 \cdot \frac{\text{kNm}}{\text{m}}$$

Max. shear force in post per m run of hoarding:

$$Q_{P.D} := \max (W_D \cdot p, W_{D.w} \cdot p + H_Z) = 0.594 \cdot \frac{\text{kN}}{\text{m}}$$

Max. blocks CRS:

$$CRS_D := \min \left(\frac{M_T}{\gamma_F \cdot M_D} \right) = 2.576 \text{ m}$$

$$CRS_D := 2.0 \text{ m}$$

Max. posts CRS:

$$CRS'_D := \min \left(\frac{M_{R1}}{M_{P.D}}, \frac{Q_{R1}}{Q_{P.D}} \right) = 5.150 \text{ m} \quad \text{no. of bays: remainder}$$

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Zone D_{FREE END}:

Overturning moment about base per m run of hoarding:

$$M_{Dfe} := \max \left[\left(W_{D.fe} \cdot h \right) \cdot \frac{h}{2}, \left(W_{Dfe.w} \cdot h \right) \cdot \frac{h}{2} + H_Z \cdot h_Z \right] = 1.409 \cdot \frac{\text{kNm}}{\text{m}}$$

Max. bending moment in post per m run of hoarding:

$$M_{P.Dfe} := \max \left[\left(W_{D.fe} \cdot p \right) \cdot \frac{p}{2}, \left(W_{Dfe.w} \cdot p \right) \cdot \frac{p}{2} + H_Z \cdot p_Z \right] = 1.104 \cdot \frac{\text{kNm}}{\text{m}}$$

Max. shear force in post
per m run of hoarding:

$$Q_{P.Dfe} := \max \left(W_{D.fe} \cdot p, W_{Dfe.w} \cdot p + H_Z \right) = 1.039 \cdot \frac{\text{kN}}{\text{m}}$$

Max. possible blocks CRS: $CRS_{Dfeblock} := \min \left(\frac{M_r}{\gamma_F \cdot M_{Dfe}} \right) = 1.472 \text{ m}$ $CRS_{D.fe} := 1.4 \text{ m}$
no. of bays: $N_{Dfe} = 7$

Max. possible posts CRS: $CRS'_{DfePost} := \min \left(\frac{M_{R1}}{M_{P.Dfe}}, \frac{Q_{R1}}{Q_{P.Dfe}} \right) = 2.943 \text{ m}$

4. Horizontal rails design:

Permissible Bending moment and Shear force

Rails used: 50x100mm C24 timber beam

$$M_{Rd2} := 0.512 \text{ kNm} \quad Q_{Rd2} := 7.03 \text{ kN}$$

No. of rails used: $n := 3$

(see app. A)

Calculated rails centres: $CRS := \frac{h}{n-1} = 1.2 \text{ m}$

The design assumption for worst case for one central rail is either full wind or working wind with min. notional horizontal load applied to a single rail.

Max. linear loads on a single rail in different wind zones:

$$q_{Br} := \max \left(W_B \cdot CRS, W_{B.w} \cdot CRS + H_Z \right) = 0.503 \cdot \frac{\text{kN}}{\text{m}}$$

$$q_{Cr} := \max \left(W_C \cdot CRS, W_{C.w} \cdot CRS + H_Z \right) = 0.391 \cdot \frac{\text{kN}}{\text{m}}$$

$$q_{Dr} := \max \left(W_D \cdot CRS, W_{D.w} \cdot CRS + H_Z \right) = 0.335 \cdot \frac{\text{kN}}{\text{m}}$$

$$q_{Dfer} := \max \left(W_{D.fe} \cdot CRS, W_{Dfe.w} \cdot CRS + H_Z \right) = 0.587 \cdot \frac{\text{kN}}{\text{m}}$$

Extreme bending moment values in different wind zones:

$$M_{Br} := 0.125 \cdot q_{Br} \cdot CRS_B^2 = 0.182 \cdot \text{kNm}$$

$$M_{Cr} := 0.125 \cdot q_{Cr} \cdot CRS_C^2 = 0.196 \cdot \text{kNm}$$

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$$M_{Dr} := 0.125 \cdot q_{Dr} \cdot CRS_D^2 = 0.168 \cdot \text{kNm}$$

Moment of resistance:

$$M_{Dfer} := 0.125 \cdot q_{Dfer} \cdot CRS_{D.fe}^2 = 0.144 \cdot \text{kNm}$$

$$M_{Rd2} = 0.512 \cdot \text{kNm}$$

hence = "PASS"

Extreme shear force values in different wind zones:

$$Q_{Br} := 0.625 \cdot q_{Br} \cdot CRS_B = 0.535 \text{ kN}$$

$$Q_{Cr} := 0.625 \cdot q_{Cr} \cdot CRS_C = 0.489 \text{ kN}$$

$$Q_{Dr} := 0.625 \cdot q_{Dr} \cdot CRS_D = 0.419 \text{ kN}$$

$$Q_{Dfer} := 0.625 \cdot q_{Dfer} \cdot CRS_{D.fe} = 0.514 \text{ kN}$$

Allowable shear force:

$$Q_{Rd2} = 7.03 \text{ kN}$$

hence = "PASS"

5. Face material design:

Permissible Bending moment and Shear force

Cover material used: 18mm FSC Grade

$$M_{Rd2} := 0.456 \frac{\text{kNm}}{\text{m}} \quad Q_{Rd2} := 6.34 \frac{\text{kN}}{\text{m}}$$

$$Q_{fply} := \max \left(0.5 \cdot 1.5 \frac{\text{kN}}{\text{m}^2} \cdot CRS, 0.5 W_{B.w} \cdot CRS + 0.5 \cdot H_Z \right) = 0.9 \cdot \frac{\text{kN}}{\text{m}}$$

$$M_{fply} := \max \left(0.125 \cdot 1.5 \frac{\text{kN}}{\text{m}^2} \cdot CRS^2, 0.125 W_{B.w} \cdot CRS^2 + 0.25 \cdot H_Z \cdot CRS \right) = 0.27 \cdot \frac{\text{kNm}}{\text{m}}$$

hence = "PASS"

Design assume worst case loading of either panel robustness loading of 1.5 kN/m² or the effect of the min. notional horizontal load mid-way between rail. Face material - simply supported.

CALCULATION		JOB No:	4157-01
 TWS DESIGN temporary works engineers	PROJECT: MEDLOCK STREET, MANCHESTER M15 5FJ	PREPARED by	MH
		CHECKED by	TS
	TITLE: 2,4M HOARDING TO THE BLOCKS PARALLEL	REVISION	C0
CLIENT: UK SITE HOARDING LTD.		DATE:	19.01.2024

6. Connection of ply to rails:

For connection design wind in zone A should be considered.

Max. linear load on a single rail in wind zone A:

$$q_A := \max(W_A \cdot CRS, W_{A.w} \cdot CRS + H_z) = 0.587 \cdot \frac{\text{kN}}{\text{m}}$$

Screws used: 3.5mm wood screws, 50mm long

Basic withdrawal load per
mm of penetration:

Assumed screws centres: $crs_s := 300\text{mm}$

$$F_{\text{ww}} := 14.7 \frac{\text{N}}{\text{mm}}$$

Factors: $K_{52} := 1.25$ (very short term loading) $K_{53} := 0.7$ (Class 3)

Point side penetration: $e_s := 50\text{mm} - 18\text{mm} = 32\text{mm}$

Permissible load per metre: $q_{Rd} := \frac{e_s \cdot F_{\text{ww}} \cdot K_{52} \cdot K_{53}}{crs_s} = 1.372 \cdot \frac{\text{kN}}{\text{m}} > q_A = 0.587 \cdot \frac{\text{kN}}{\text{m}}$

hence = "PASS"

7. Connection of rails to post:

$$CRS_A := CRS_B = 1.7\text{m}$$

Max. point load on a single post in wind zone A:

$$P_p := \max(W_A \cdot CRS, W_{A.w} \cdot CRS + H_z) \frac{CRS_A}{2} = 0.499 \cdot \text{kN}$$

Basic withdrawal load per
mm of penetration:

Screws used: 4mm wood screws, 100mm long

Assumed no. of screws: $N_s := 1$

$$F_{\text{ww}} := 16.3 \frac{\text{N}}{\text{mm}}$$

Design factors: $K_{52} := 1.25$ (very short term loading) $K_{53} := 0.7$ (Class 3)

Point side penetration: $e_s := 150\text{mm} - 50\text{mm} = 100\text{mm}$

Permissible load per connect.: $P_{Rd} := N_s \cdot e_s \cdot F_{\text{ww}} \cdot K_{52} \cdot K_{53} = 1.426 \cdot \text{kN} > P_p = 0.499 \cdot \text{kN}$

hence = "PASS"

NOTE: The rails are not continuous past the post, hence the loaded length is halved

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8. Check sliding resistance:

$s_{\mu} := 2.0$ - factor of safety for sliding actions

$\mu := 0.45$ - friction factor (concrete- tarmac/pavement)

$\gamma_{ply} := 18 \text{mm} \cdot 7 \frac{\text{kN}}{\text{m}^3} = 0.126 \cdot \frac{\text{kN}}{\text{m}^2}$ - plywood weight (sliding resistance including plywood weight)

Sliding Zone B:

Horizontal Load: $Q_{s,B} := \max(W_B \cdot h, W_{B,w} \cdot h + H_z) \cdot CRS_B = 1.711 \cdot \text{kN}$

Sliding Resistance: $Q_{s,BR} := \mu \cdot \frac{[M_{block} + (h \cdot CRS_B) \cdot \gamma_{ply}]}{s_{\mu}} = 1.671 \text{ kN}$ hence = "NOT OK"

Sliding Zone C:

Horizontal Load: $Q_{s,C} := \max(W_C \cdot h, W_{C,w} \cdot h + H_z) \cdot CRS_C = 1.565 \cdot \text{kN}$

Sliding Resistance: $Q_{s,CR} := \mu \cdot \frac{[M_{block} + (h \cdot CRS_C) \cdot \gamma_{ply}]}{s_{\mu}} = 1.691 \text{ kN}$ hence = "PASS"

Sliding Zone D:

Horizontal Load: $Q_{s,D} := \max(W_D \cdot h, W_{D,w} \cdot h + H_z) \cdot CRS_D = 1.342 \cdot \text{kN}$

Sliding Resistance: $Q_{s,DR} := \mu \cdot \frac{[M_{block} + (h \cdot CRS_D) \cdot \gamma_{ply}]}{s_{\mu}} = 1.691 \text{ kN}$ hence = "PASS"

Sliding Zone D_{FREE}:

Horizontal Load: $Q_{s,Dfe} := \max(W_{D.fe} \cdot h, W_{Dfe,w} \cdot h + H_z) \cdot CRS_{D.fe} = 1.644 \cdot \text{kN}$

Sliding Resistance: $Q_{s,DfeR} := \mu \cdot \frac{[M_{block} + (h \cdot CRS_{D.fe}) \cdot \gamma_{ply}]}{s_{\mu}} = 1.65 \text{ kN}$ hence = "PASS"

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9. Check withdrawal on connection bolts to block:

$c_{top} := 100\text{mm}$ - bolt to upper block edge distance

$c_{bot} := 100\text{mm}$ - bolt to lower block edge distance

$c_{rs_bolt} := H_b - c_{top} - c_{bot} = 0.2\text{ m}$ - bolt centres

Max. bending moment at top bolt position:

$$M_{bolt} := \max(M_{P.B} \cdot CRS_B, M_{P.C} \cdot CRS_C, M_{P.D} \cdot CRS_D, M_{P.Dfe} \cdot CRS_{D.fe}) = 1.609 \cdot \text{kNm}$$

Max. withdrawal force on bolts:

Allowable WF for M12 8.8 R-KEX
RAWL threaded rod

$$SF_{bolt} := \frac{M_{bolt}}{c_{rs_bolt}} = 8.046 \cdot \text{kN} < ASF_{M12} := 0.83 \cdot 15.7 \text{kN} = 13.031 \text{kN}$$

hence = "PASS"

Characteristic value of compression perpendicular for timber post:

$$f_{c.90.k} := 2.2 \text{MPa} \quad (BS EN 338:2009)$$

$$k_{mod} := 0.7 \quad (\text{Solid timber; service class 3, short term action})$$

$$\gamma_M := 1.3 \quad (\text{Recommended partial factor of material properties \& resistances})$$

Design value of compression perpendicular for timber post:

$$f_{c.90.d} := f_{c.90.k} \cdot \frac{k_{mod}}{\gamma_M} = 1.185 \cdot \text{MPa}$$

$$k_{c.90} := 1.5 \quad (\text{For solid timber member on discrete supports loaded by distributed loads and/or by concentrated loads if } c_{rs_bolt} > 2xh_{post})$$

Required area of embedment strength:

$$A_{req} := \frac{SF_{bolt}}{f_{c.90.d} \cdot k_{c.90}} = 4528.219 \cdot \text{mm}^2$$

Washer plate edge: **Squ := 70mm**

$$A_{prov.s} := Squ \cdot Squ - 0.25 \cdot \pi (12\text{mm})^2 = 4786.903 \cdot \text{mm}^2$$

hence = "PASS"

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	CLIENT: UK SITE HOARDING LTD.	DATE:	19.01.2024

10. Design Summary:

1. Use **75x150 C24** constructional sawn timber posts at following crs: **1.7m** (zone B- 3 Bays) , **2.0m** (Zone C & Zone Dreminder), **1.4m** (zone D_{FREE END} - 7 bays)
2. Use 3**No. 50x100 C24** constructional sawn timber rails at **1200mm** CRS
3. Face material -**18mm Plywood**
4. Use **3.5mm wood screws 50mm long** for the ply to rail connection at **300mm** centres
5. Use **1No. 4mm wood screws 100mm long** per rail to post connection
6. Posts to be secured to concrete kentledge block of dimensions: **1200x600x400mm**
7. Timber posts fixed to the **front** of kentledge blocks with **M12 R-KEX RAWL Thread bar 8.8** or **other approved resin anchor to concrete blocks** with **70x70x6mm thick steel washer** under each bolt. min 100mm edge distance, min 120mm embedment.
8. All timber holes : **pre-drilled.**

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APPENDIX A

Allowable internal forces
for timber beams

75x150mm C24 timber posts

Geometry details:

$$a = 3 \cdot \text{in} \quad b = 6 \cdot \text{in} \quad \text{Dimensions of cross-section:}$$

$$A_s := a \cdot b = 112.5 \cdot \text{cm}^2 \quad \text{Section area:}$$

$$I_y := \frac{a \cdot b^3}{12} = 2109.375 \cdot \text{cm}^4 \quad \text{Moment of inertia:}$$

$$W_y := \frac{a \cdot b^2}{6} = 281.2 \cdot \text{cm}^3 \quad \text{Section modulus:}$$

$$fZ = 7.5 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Bending stress parallel to grain}$$

$$qA = 0.71 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Shear stress parallel to grain (service class 3)}$$

$$E_{0.\text{mean}} = 8640 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Mean modulus of elasticity (service class 3)}$$

$$E_{\text{min}} = 5760 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Minimum modulus of elasticity:}$$

$$K_{2b} := 0.8 \quad \text{Factor converting service classes 1 and 2 strength classes to service class 3 (bending)}$$

$$K_{2s} := 0.9 \quad \text{Factor converting service classes 1 and 2 strength classes to service class 3 (shear)}$$

$$\text{Load sharing factor: } K_8 = 1$$

$$\text{Duration of load factor: } K_3 = 1.75$$

$$\text{Bearing stress factor: } K_4 := 1.0$$

$$\text{Form factor: } K_6 := 1.0$$

$$\text{Depth factor: } K_7 = 1.101$$

PERMISSIBLE STRESSES

Shear load:

$$V_{RdP} := \frac{2}{3} qA \cdot A_s \cdot K_{2s} \cdot K_3 \cdot K_4 \cdot K_6 \cdot K_8 = 8.39 \cdot \text{kN}$$

$\frac{2}{3}$ FACTOR FOR RECTANGULAR SECTION

Moment of resistance:

$$M_{RdP} := fZ \cdot W_y \cdot K_{2b} \cdot K_3 \cdot K_4 \cdot K_6 \cdot K_7 \cdot K_8 = 3.252 \cdot \text{kN} \cdot \text{m}$$

50x100mm C16 timber rails

Geometry details:

$$a = 4 \cdot \text{in}$$

$$b = 2 \cdot \text{in}$$

Dimensions of cross-section:

$$A_s := a \cdot b = 50 \cdot \text{cm}^2$$

Section area:

$$I_y := \frac{a \cdot b^3}{12} = 104.167 \cdot \text{cm}^4$$

Moment of inertia:

$$W_y := \frac{a \cdot b^2}{6} = 41.7 \cdot \text{cm}^3$$

Section modulus:

$$f_Z = 7.5 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Bending stress parallel to grain}$$

$$qA = 0.71 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Shear stress parallel to grain (service class 3)}$$

$$E_{0.\text{mean}} = 8640 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Mean modulus of elasticity (service class 3)}$$

$$E_{\text{min}} = 5760 \cdot \frac{\text{N}}{\text{mm}^2} \quad \text{Minimum modulus of elasticity:}$$

$$K_{2b} := 0.8 \quad \text{Factor converting service classes 1 and 2 strength classes to service class 3 (bending)}$$

$$K_{2s} := 0.9 \quad \text{Factor converting service classes 1 and 2 strength classes to service class 3 (shear)}$$

$$\text{Load sharing factor: } K_8 = 1$$

$$\text{Duration of load factor: } K_3 = 1.75$$

$$\text{Bearing stress factor: } K_4 := 1.0$$

$$\text{Form factor: } K_6 := 1.0$$

$$\text{Depth factor: } K_7 = 1.17$$

PERMISSIBLE STRESSES

Shear load:

$$V_{RdP} := \frac{2}{3} qA \cdot A_s \cdot K_{2s} \cdot K_3 \cdot K_4 \cdot K_6 \cdot K_8 = 3.73 \cdot \text{kN}$$

$\frac{2}{3}$ FACTOR FOR RECTANGULAR SECTION

Moment of resistance:

$$M_{RdP} := f_Z \cdot W_y \cdot K_{2b} \cdot K_3 \cdot K_4 \cdot K_6 \cdot K_7 \cdot K_8 = 0.512 \cdot \text{kN} \cdot \text{m}$$

Appendix 6

MCC Partial Footpath Closure Acknowledgement

From: [Ruth Bradford](#)
To: [Thomas Swan](#)
Subject: FW: Manchester City Council streetworks permit/licence
Date: 25 January 2024 11:15:21

From: Highway Licences <highwaylicences@manchester.gov.uk>
Sent: 08 January 2024 09:42
To: Austin Wilkinson <austin@awdemolition.co.uk>
Cc: Ruth Bradford <ruth@awdemolition.co.uk>
Subject: Re: Manchester City Council streetworks permit/licence

Hi Austin

That fine no issues with the Hoarding , regards

From: Austin Wilkinson <austin@awdemolition.co.uk>
Sent: 08 January 2024 09:34
To: Highway Licences <highwaylicences@manchester.gov.uk>
Cc: Ruth Bradford <ruth@awdemolition.co.uk>
Subject: Re: Manchester City Council streetworks permit/licence

You don't often get email from austin@awdemolition.co.uk · [Learn why this is important](#)

Good Morning Steve,

Good to chat with you this morning. As mentioned and agreed, please see attached redline for hoarding leaving two meters remaining.

Regards

Austin Wilkinson
Managing Director
AW Demolition Ltd

