

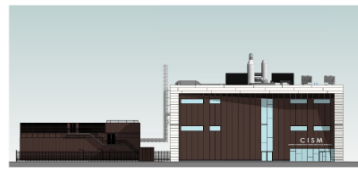
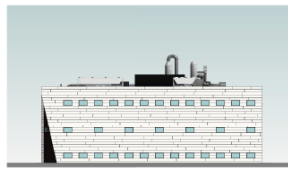
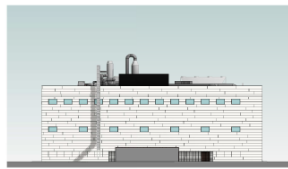
CISM Building

Swansea University

Construction Methodology / Management Plan



Swansea University
Prifysgol Abertawe



Document Control

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Report Title	Construction Methodology Plan
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Distribution

Organisation	Contact	Copies
See attached email	Internal Kier Pre-Construction Team Review	
See attached email	Pre-Construction and Client Team Review	
See relevant emails for S/c orders	Operational Pre-Commencement Submission	



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1.0 Project Summary

1.1 Location and Description

The CISM Building will provide a new university building to the existing and developing Swansea University Bay Campus. The scheme is located approximately 4.5km east of Swansea city centre. The scheme is approached from the A483 (Fabian Way) which is situated to the north of the site, see Figure 1. The site is surrounded on three sides with existing university buildings to the north (ESRI), west boundaries (ISM Smart), east (Active Classrooms / service yard access route) and the south (Service Yard).

The site was formerly an oil terminal from the 1960s to circa 2003. Removal of the oil storage tanks began in 2003 and the site has been remediated and redeveloped as the University Campus from circa 2013.

It is considered that no significant remedial works, other than the incorporation of engineering measures (gas protection) are required for the proposed University end use development. A site specific geotechnical and site investigation has been undertaken to form the foundation design of the proposed CISM building. This provided further details on the ground conditions and confirmed the levels of residual contamination (moderate to high risk)

The principal known hazards include variable 'made ground' with a potential low bearing capacity. Consequently, shallow foundations are considered unsuitable for the site. There is a relatively high groundwater table at the site.

There are significant cobbles and boulders within the glacial deposits underlying the site. These obstructions are likely to limit the piling solution to pre-cast driven piles as there is the flexibility to remove and install piles in the event of an obstruction; this is less feasible with other piling methods.

Shallow excavations and earthworks should be possible with conventional plant and techniques. It is likely that shallow groundwater will be encountered and groundwater control will be required to maintain stability within the excavation.

The ground conditions are suitable for piled foundations for the CISM building. Due to the presence of obstructions in the form of sandstone cobbles and boulders – the most appropriate piling method will be a combination of pre-cast concrete and steel driven piles. The steel driven piles being designed / located within proximity of the existing University Buildings (ISM – Smart and ESRI)

The wider Swansea Bay Campus, has undergone various phases of site investigation, contaminated land assessments and remediation works within proximity of the CISM building. These records concluded that "concentrations of residual contaminants remaining within the existing soils and groundwater at the site are not at levels where exposure would typically cause acute effects during general construction works and that the site is suitable for the intended use." and "No further physical 'remediation' works are considered necessary based upon the use of the site as a university campus as proposed."

Based upon the previous Site and Ground Investigation Reports (Computer Foundry, ISM-Smart and the ERSI Buildings) – Stage 4 design has been based upon suspended bearing floor slab. All formation levels will be proofed roll and any loose soft organic or otherwise unsuitable materials will be removed and replaced with granular fill. The new building will comprise of cast in-situ reinforced (RC Frame) construction. The external facades / envelopes will comprise of feature cladding panels and a splayed cladding canopy on the north elevation (*Main Entrance*) The CISM Building comprising of office and laboratory facilities (including specialist clean rooms and plant areas).

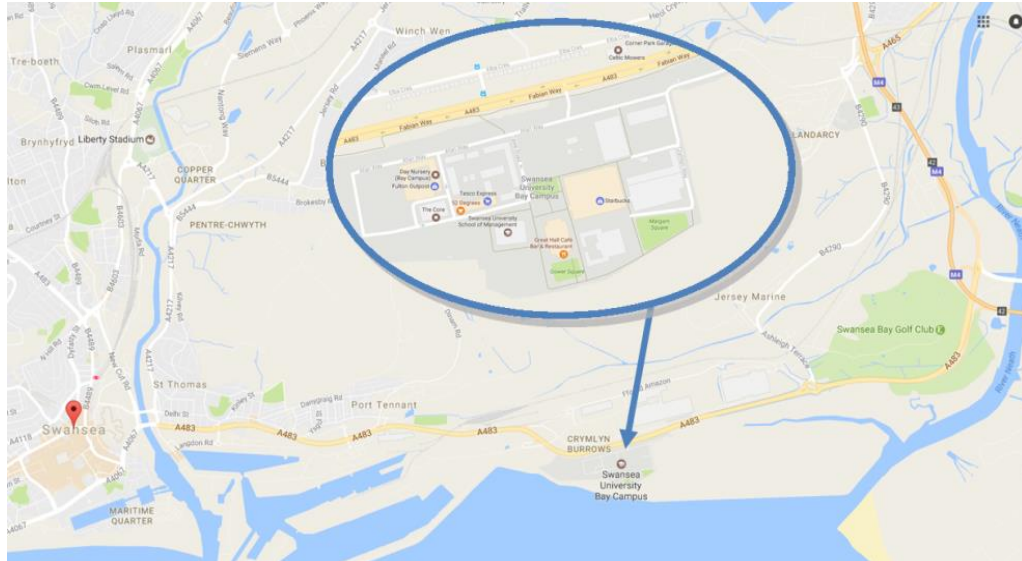
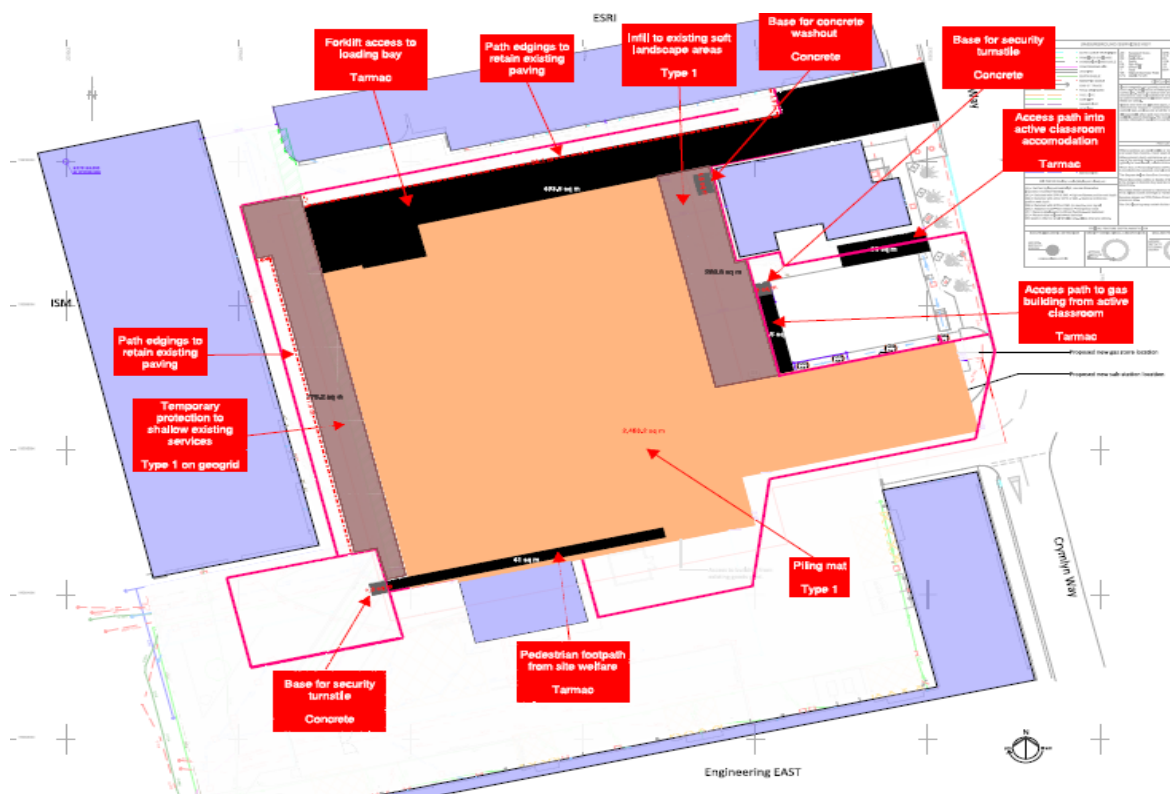


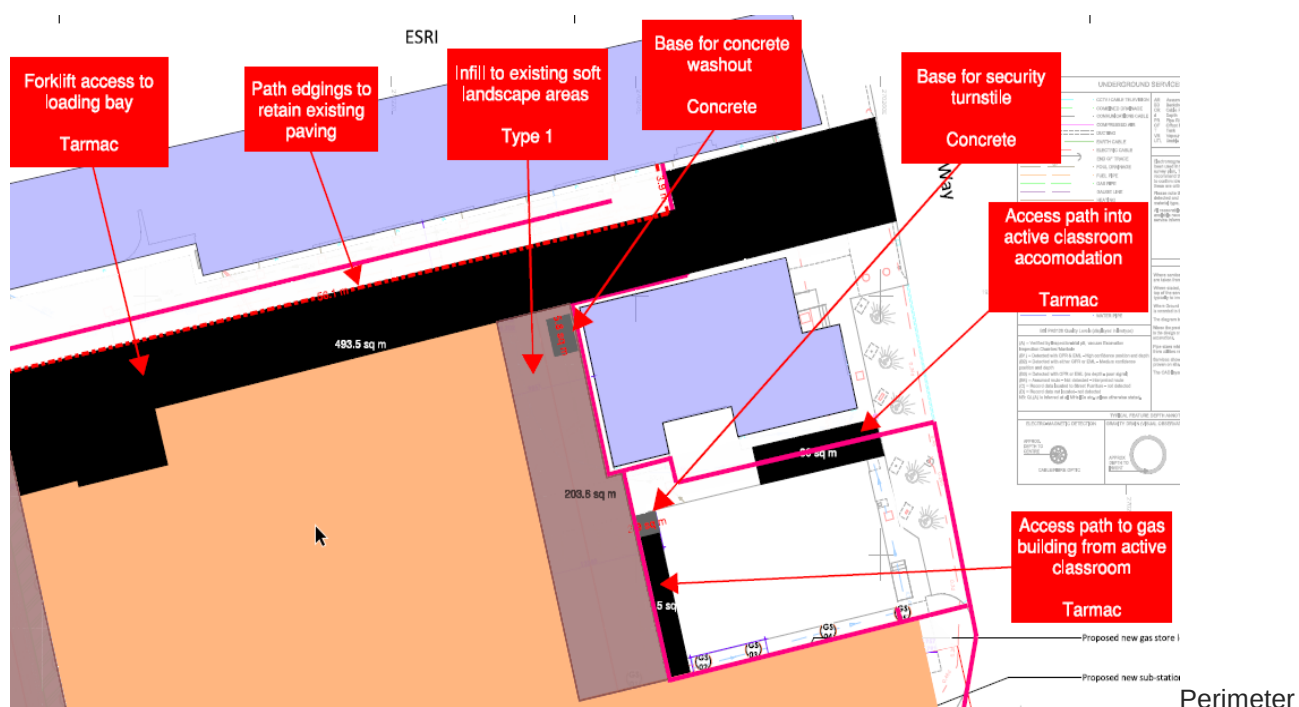
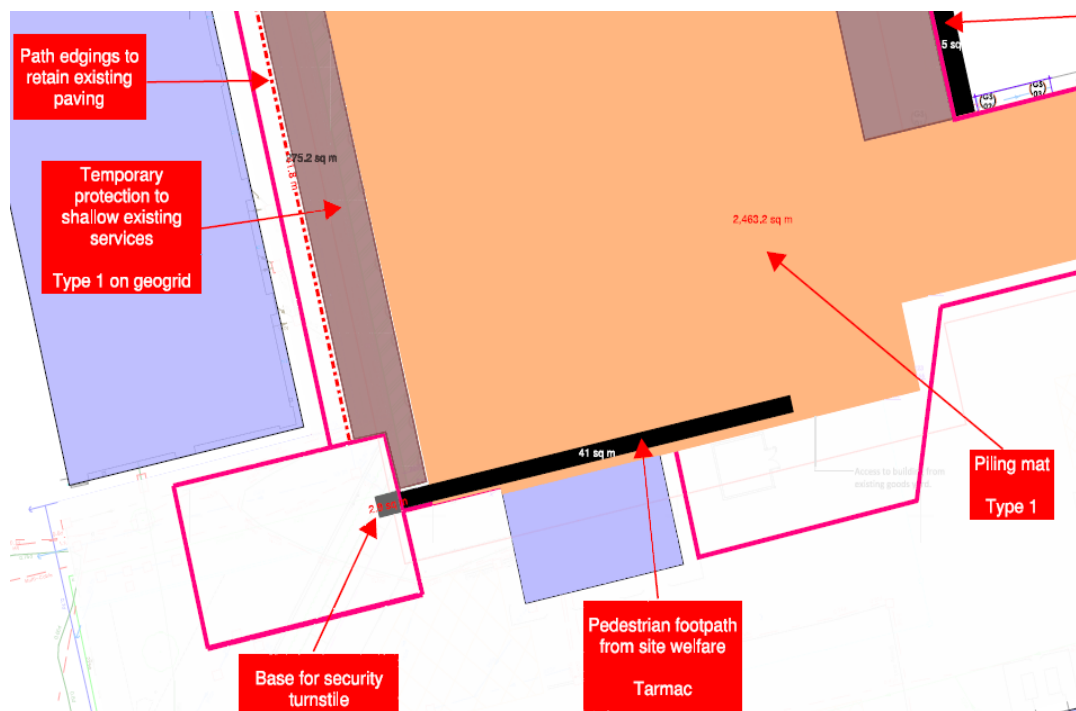
Figure 1: Map of site location

The full extent of the Site Boundary is indicated on the 'Site Logistic Plans' below:-

Extent of the Site Boundary is denoted by the red boundary lines



Abstract of the Site Logistic Plan – South / West Boundaries of the site



Perimeter

(Key - Blue denotes hoarding fixed into Ground / Red denotes hoarding is counterbalance)



Site Accommodation / Welfare Facilities Compound



2.0 Project Information and Constraints:

The Construction Method statement is based upon the utilisation of 'Fabian Way' vehicular access for all construction traffic. The method statement that follows contains details of the proposed routing and frequency / timing of vehicle movement.

2.1 Site Boundaries, Security and Access

The site is situated on the existing University Bay Campus and is surrounded by existing university buildings; to the east; the **Active Office** and **Classroom**, the south; **Engineering Service Yard**, the west elevation will be the **ISM Smart Building**, to the south; the **ESRI Building**. The site will fall under the Universities existing 24 hour security and the site boundaries will be secured by a combination of solid metal hoarding and Heras fencing – See site logistic plan for designated areas.

The arrival and deliveries of personnel and materials will need to be planned and managed carefully and communicated on a regular basis to the neighbouring properties / businesses. Kier Construction will hold regular logistics meetings with the relevant parties including two week look ahead plans that can be communicated to other third parties (ISM Smart and ESRI Buildings) through the correct procedures and protocols via the **Project Officer** or his **Appointed Representative**. These meetings will provide an excellent opportunity to discuss / review the forthcoming critical construction activities planned for the coming weeks, such as any major deliveries; cart away of the excavated / reduced levels and the import of the piling mat stone, piling rig, formwork, reinforcement, concrete pours (Sub-structure and RC Frame Works), Structural Steelwork, external Cladding materials and Curtain Walling etc.

All construction traffic and deliveries will exit the west bound dual carriageway (Fabian Way) at the first set of traffic lights. This alternative access will avoid vehicles entering the main university entrance situated opposite the Engineering North building. All vehicles will be checked at the gate house (see site logistic plan options 1 – 3 below) in advance of entering the CISM site.

Pedestrian access will be via the pedestrian access gate as demonstrated in Figure 2 to the site compound. There is no vehicle parking on site, vehicles will be expected to park in the '**On Campus Contractor Parking Area**' located further west of the Campus.

Our proposed Site Logistics Plan for the CISM Building 'Site Accommodation and Welfare Facilities' are as stated below:-

Agreed Option

The Kier offices for the enabling works and *RC Frame* construction will comprise of the Active Classroom and 3 on 3 *Welfare Facilities* positioned on the south / west corner of the site. The site accommodation will be increased during the critical elements of construction as a consequence of increased resources after the *RC Frame* is completed. The additional site accommodation and welfare facilities will consist of 4 on 4 cabins positioned on the waste land adjacent to the west elevation of *Engineering North*. The compound will also provide storage area for construction materials and sub-contractors cabins in general.

Deliveries to site will be managed in accordance with our delivery procedure plan. This procedure and site directions will be communicated to our supply chain suppliers and contractors. Restrictions to parking on the Campus will be advised and designated parking area will be identified to the contractors.

Kier Construction / Sub Contractors will abide by the site speed limit of 5mph at all times.



Figure 2: Speed limit on site

The proposed delivery and vehicle logistics are demonstrated above; due to the nature of the live campus it will not be possible for various delivery vehicles to arrive at any given time without prior notice. Kier plan to closely monitor this throughout the works through having “Just-In Time” deliveries to avoid over storage of materials on site, although dedicated areas on site have been allocated for storage with also a small provision for storage of materials in the “Contractors Car Park”. To alleviate build-up of delivery vehicles within the University grounds, Kier plan to utilise a lay-by just off Junction 42, M4 where deliveries can utilise this as a call point so they can call ahead for access onto site, this way they can be given access only when the route is clear and they can be let straight onto site to avoid congestion on the campus roads.

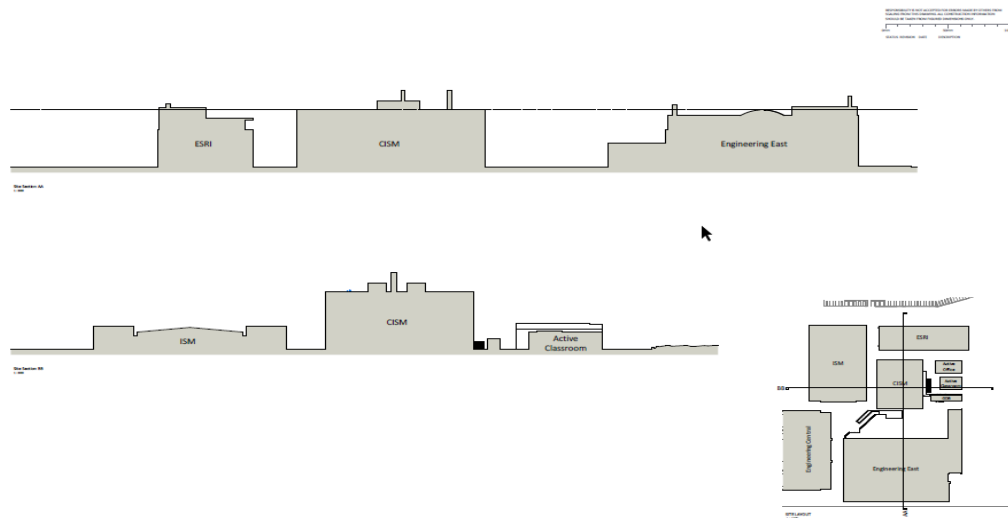


Location of lay-by for delivery vehicles and proposed site contractors delivery route





2.3 Key Constraints & Challenges



Constraints and Challenges:

1. Working on a 'Live' campus environment
 - 1.1 **'Live'** University Buildings within proximity of CISM Building (*ISM - Smart and ERSI Buildings*)
 - 1.2 **'Live'** Service Yard to the south boundary
 - 1.3 Ground Conditions (CFA Piling Methodology)
2. Confined Site (storage restrictions)
3. Diversion of existing services (*maintaining existing services*)
4. Construction / Piling Methodology (*risk of damages due to vibration to adjacent structures*)
5. Traffic and pedestrian Management
 - 5.1 Interfaces with the General Public
 - 5.2 Interfaces with the University Staff & Students
6. Material storage Limitations
7. Parking Limitations
8. Maintaining fire escapes and evacuation procedures
9. Inclement Environment / Exposure
10. SSSI constraints
11. Manual handling requirements / heavy lifts – cladding units
12. Removal of existing Oracle Buildings / Enabling Works and service yard modifications
13. Noise and Dust Pollution

3.0 Ecology and Pollution Control

Due to the works being carried out on the live Swansea University Bay Campus they will come under the university wide ecology report.

A Site Investigation report / surveys previously undertaken on the ground conditions prior to commencing works on site.- (Information to be read in conjunction with the underground utility survey plan produced by AECOM (Malcolm Hughes Chartered Land Surveyors – reference drawing 54812-MH-VUT-Swansea_Uni_Bay-M2-G-0001).

Prior to commencing works on site Kier will provide a **Site Specific Environmental Management Plan** which will include the following:

- Carry out a site specifics impacts and aspects assessment
- Prepare, monitor and manage the site Specific Site Waste Management Plan
- Align and link our Emergency Response Procedures and advise neighbouring buildings through the Project Officer and / or his representative
- Aligning the works to any ecological timing and constraints where this is appropriate for the University

All of the above would then be fed into the **Construction Phase Plan** and be regularly monitored and managed throughout the duration of the works.

As part of the site induction, Kier Construction staff and supply chain subcontractors will be briefed on the content of the documents and instructed to abide by any specific controls set out by Kier Construction.

Support will also be provided by Kier dedicated Environmental Advisor (Chris Grimes) who will be involved in the early stages of the project to ensure that good environmental practices are adopted at the beginning and maintained throughout the project duration. Chris will assist with the completion of the site specific Environmental Impacts and Aspects Register.

3.1 Dealing with Groundwater

Precautions will be taken when excavating to ensure silts are not allowed to migrate to any watercourse within the site boundary. A method statement will be produced to include a de-watering solution for excavating of drainage and substructure ground works. This will also be closely developed with the groundworks specialist.

Cut off ditches or geotextile silt fences will be installed as and when deemed necessary around excavations in order to prevent migration of silts into watercourses.

The silt buster (or similar precautionary wash out systems) will be used to filter out any contaminants from the ground / excavation activities to a suitable level and directed to a settlement area within the compound prior to any controlled or permissible discharge.

All earth moving plant will be controlled to reduce the risk of construction silt combining with any site run off.



Figure 3: Silt-buster example



Figure 4: Washout into silt-buster

3.2 Fuel / Oil Storage

To minimise the risk of contamination from spills of oil, fuels and chemicals, they will be stored within a safe / designated area on the CISM site. (**See site logistics plan**). Operatives will be trained in the refuelling of vehicles and attendance to spillage and spill procedures. These designated areas will be away from any draining points. Suitable bunds and drip trays will be used to collect material and prevent ground contamination. Fuel oil will be stored within a bund fuel bowser that will hold 110% of its capacity. Chemicals will be stored in a designated COSHH storage area also on site.

A spill kit will be located within a specific area of the site and will be clearly marked. All operatives will be made aware of this and other site specific controls at induction stage and within subcontract orders.

In the event of a spillage, an emergency spill response will be adhered to as set out within Kier Construction Environmental Plan procedures.

3.3 Dealing with Contaminated Land / Arising material.

Although it has not been identified all excavation works throughout the substructure, externals and landscaping will be closely monitored to ensure any signs of contaminants in the ground will be identified and further investigated, if required.

Further material testing will be undertaken to determine the 'nature' of the arising's.

The management of findings and material will fall in line with the established SEMP and procedures therein.

During excavation works and the limitative *CFA Piles*, all method statements will cover the possibilities of discovering unknown contamination and detail all procedures for dealing with it by the specialist ground worker as and when identified.

Risk reduction method will be put into place by breaking the pollutant links as follows:-



A material management plan will be produced to demonstrate an appropriate methodology for removing storing and treating contaminated material if 'hot spots' are discovered.

If unexpected contamination is encountered the appropriate authority will be notified in accordance with the conditions set out as part of the planning consent. All works will stop, and the management / remediation plan amended for approval in advance of any works re commencing within these areas.

3.4 Working Hours

Normal site working hours will be between the hours of 0700 am - 1700 pm Monday to Friday and 0800 am and 0700am - 1300 pm on Saturday – (Sundays working by agreement of the Environmental Health Officer and Swansea University).

Working on Sundays will be limitative and only undertaken by prior agreement with the Environmental Health Officer. We do not envisage any Sunday working during the sub and super structure programme of works. We shall review Sunday working as work proceeds and advise with notice to the Environmental Health Officer of any such planned works.

3.5 Adjacent buildings and features

During the construction works it is essential that the adjacent buildings (ISM – Smart and the ERSI Buildings) and features are taken into consideration.

The following buildings surround the proposed location of the site, ISM and the ERSI Building on the west and north elevations respectively, and on the south boundary is the main service yard which feeds the engineering facilities.

Kier Construction will regularly liaise with the university regarding neighbouring properties in order to minimise any such disruption.

Kier Construction will work collaboratively with neighbours and work in line with the Traffic management plan. The plan will be reviewed on a regular basis to ensure that we meet the traffic and delivery challenges demanded on a project of this size and magnitude.

Kier will also be putting in place noise and vibration monitoring to monitor the ambient levels prior to commencing works on site and during the works to ensure the works are not having any effect on the neighbouring buildings.

3.6 Control of Dust, Emissions and Odours

The control of dust and emissions forms part of the environmental plan. Controlling dust is deemed as important for health reasons, emissions from plant and machinery must also be controlled as they can be a major contributor to pollution.

Throughout the project Kier will monitoring the creation of dust and adopted a strategy to minimise the amount of dust generated. The preventative actions taken will include:

- Water Damping / suppression if deemed required
- Extraction of dust from source where possible
- Tarmac access routes adjacent gate entrances. Wheel-wash facilities to prevent dust / granular fill being taken out onto the link roads and / or the public highway
- Cover waste skips

3.7 Control of Noise and Vibration

As well as being a major hazard for site operative's noise can also be an annoyance for neighbours and disturb local wildlife. Due to the site being in close proximity to university buildings and the SSI adjacent site it is important that noise is monitored and reduced as much as possible.

Vibration will also be monitored and steps taken to reduce such activities. Vibration monitoring points will be set up at various locations in advance of the sub-structure and piling works commencing, This will monitor the levels and record findings, should any levels reach the action rate then works will be ceased and methodology going forward will be discussed prior to activities re-commencing.

The following steps will be considered:

- Careful selection of equipment
- Use of noise control equipment
- Locate noisy operation as far from receptors as possible
- Maintain all plant and machinery

Control of noise and vibration will form part of our site wide environmental plan.

4.0 Community Engagement and Liaison

As part of the project it is important to identify the key stake-holders. As previously mentioned all local businesses, residents and other university buildings will be kept informed and a constant dialogue upheld to ensure all queries and concerns are addressed and resolved promptly.

Further information on the 'Community Engagement' will be contained within the 'Community Engagement Plan'.

The Kier Construction community engagement officer (Amanda Swoboda) will be assigned to the project to provide links with the local community, schools & colleges and identify employment opportunities for the local people. The project will give opportunities for apprenticeships and work experience.

The site will be registered with the Considerate Constructors Scheme.



Figure 5: CCS Logo

5.0 Public Safety

A great emphasise will be placed on public safety as with all projects undertaken by Kier Construction. A number of procedures will be implemented to ensure the safety of the general public is not compromised at any time:

- Maintain a fully enclosed site to the University Campus – see site logistics plan
- Good housekeeping to be maintained outside the site boundary, all adjacent roads will be inspected on a daily basis and cleaned as and when required.
- Deliveries to be controlled effectively to ensure minimal disruption to university staff and students and the general public.
- Visitor's inductions to be undertaken.
- Timed deliveries to minimise gridlock on 'Fabian Way' and co-ordinated with the Traffic Management Plan.
- Dust, noise and vibration monitoring and mitigation to take place throughout the project.
- Complaint logging and resolution to be in place to ensure any comments are dealt with promptly.
- Good informative signage to identify all hazards on site to the public and operatives

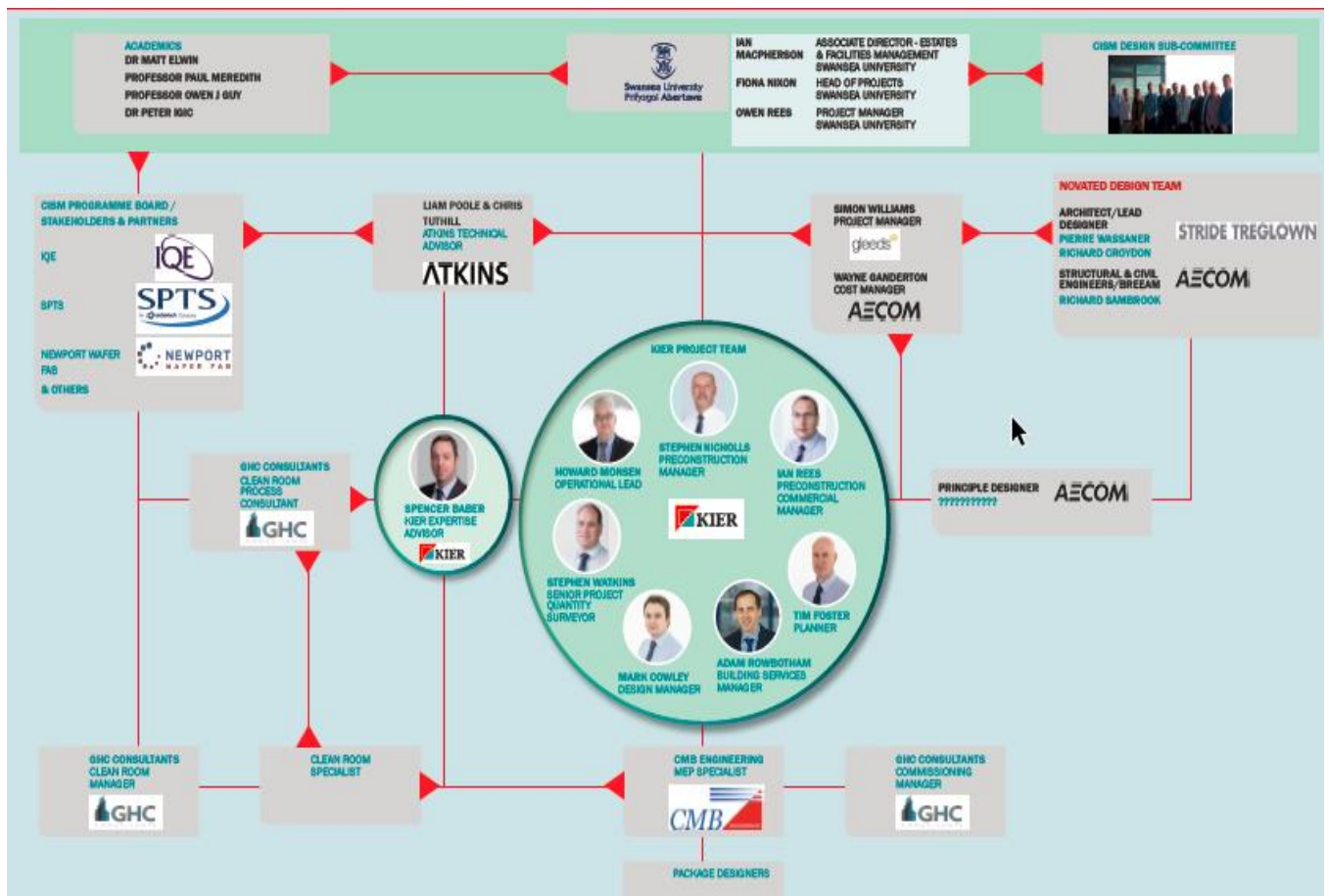
5.1 General Site Rules

1. The site is a non-smoking site; there will be a designated smoking area assigned within the site boundary.
2. Subcontractors to provide a quality control plan within their method statement prior to commencing 'the works'
3. All inductions will require signature and identification prior to allowing personnel onto site
4. All operatives to be CSCS qualified
5. All subcontractors are responsible for protecting their materials and works from others
6. All contractors on site are responsible to segregate their waste into the skips
7. Method Statements and Risk Assessments are required minimum of 1 week in advance of their works commencing; no works will commence without approval of the method statement / risk assessment
8. Material delivery to site is on a time required basis unless specifically agreed otherwise i.e. no materials to be stored in excess of one week ahead of planned works commencing unless agreed by Kier Construction
9. No parking permitted on site, contractors to utilise Campus Contractors Car Park
10. All contractors must comply with the WRAP and BREEAM requirements
11. Toolbox talks to be carried out by the subcontractors supervisors as works proceed on site; All records of training to be issued to Kier Construction on a weekly basis
12. Local labour to be employed wherever possible – see community engagement plan for detail
13. Daily labour records to be issued to Kier Construction on a weekly basis (information to include labour and plant resource levels, material deliveries and weather records)
14. Minimum PPE requirements are listed as follows:-
 - i. Hi vis
 - ii. Helmet
 - iii. Steel Toecap & sole boots
 - iv. Gloves-appropriate to task being undertaken
 - v. Safety Glasses
15. O&M information to be issued as works proceed and are completed. ALL information to be issued a minimum of 4 weeks in advance of project completion.
16. Material storage requirements on site are to be agreed with Kier Construction prior to works commencing and approval of the method statements
17. Permits to work will be operational and will include the following:-

See Kier Construction 'Minimum Health and Safety Standards'

 - i. Permit to Locate/ Dig
 - ii. Hot works
 - iii. Confined spaces
18. All operatives on site will require CSCS qualification, PASMA, CPCS etc.
19. All CSCS cards are to be presented to Kier Construction staff at site induction for acceptance
20. Site inductions will be planned on a daily basis
21. All site electrical equipment must have current PAT certification
22. Interface with the general public to be polite and courteous at all times
23. All materials to be sustainable & locally source where possible with support documentation issued to Kier Construction to support the BREEAM credit.
24. All visitors must report to the Kier site office

5.2 Project Communication Plan



KEY

PRECONSTRUCTION

PRECONSTRUCTION AND CONSTRUCTION

CONSTRUCTION

POST CONSTRUCTION

ALL STAGES

COMMERCIAL

DELIVERY

WAYNE GANDERTON
CLIENT COST
MANAGER
AECOM

JASON TAYLOR
OPERATIONS DIRECTOR
I have an excellent
relationship with
Swansea University

SENIOR MANAGEMENT TEAM

CHRIS HART
OPERATIONAL
COMMERCIAL
MANAGER

NIGEL PHILLIPS
OPERATIONS MANAGER
I have an excellent
relationship with
SPS/STC/Swansea Uni.

STEPHEN NICHOLLS
PRECONSTRUCTION
MANAGER
I have previously worked
with Swansea Uni.

IAN REES
PRECONSTRUCTION
COMMERCIAL
MANAGER

HOWARD MORSEN
OPERATIONAL LEAD
I have previously worked
with Swansea Uni.

SPENCER BABER
KIER EXPERTISE
ADVISOR

AMANDA SIWOBOGA
COMMUNITY BENEFITS
& TR&T COORDINATOR
I have locally and have
worked with Swansea Uni.

RIVIS MORRISON
ESTIMATOR
I worked on the Active
Classroom

TIM FOSTER
NEC PLANNER

ADAM ROWSBOTHAM
BUILDING SERVICES
MANAGER

MARK COWLEY
DESIGN MANAGER &
BREEAM CHAMPION
I have previously worked
with Swansea Uni.

STEPHEN WATKINS
SENIOR QUANTITY
SURVEYOR
I have previously worked
with Swansea Uni.

RUSSELL BAKER
SENIOR BIM MANAGER

ALISTAIR RICHARD
SUPPLY CHAIN
MANAGER

SUPPLY CHAIN

CLIENT

IAN MACPHERSON
ASSOCIATE DIRECTOR
- ESTATES & FACILITIES
MANAGEMENT
SWANSEA UNIVERSITY

FRONA NIXON
HEAD OF PROJECTS
SWANSEA UNIVERSITY

OWEN REES
PROJECT MANAGER
SWANSEA UNIVERSITY

SIMON WILLIAMS
PROJECT MANAGER
gleeds

LIAM POOLE/
CHRIS TUTTILL
CLIENT TECHNICAL
ADVISOR
ATKINS

CISM PROGRAMME BOARD / STAKEHOLDERS & PARTNERS

IQE

SPTS

NEWPORT WAFER
FAB
& OTHERS

INNOVATED DESIGN TEAM

ARCHITECT/LEAD
DESIGNER
RICHARD CROYDON
STRIDE TREGLOWN

STRUCTURAL & CIVIL
ENGINEERS/BREEAM
RICHARD SANDBROOK
AECOM

EXPERTISE

KIER TECHNICAL
ADVISOR
SPENCER BABER
KIER

FABRIC FIST
CHAMPION
JEREMY MANN
KIER

REGIONAL
SUPPORT

JONATHAN LEWIS
HEALTH & SAFETY
I work locally

STEPHEN
WINTERBOURN
QUALITY/TECHNICAL
MANAGER

CHRIS BRIMES
ENVIRONMENTAL AND
BREEAM ADVISOR

SAM WILLIAMS
BUYING/
PROCUREMENT

KATE ELLIS
PUBLICITY AND
CORPORATE
RESPONSIBILITY
MANAGER

WENDY STEPHENS
HEALTH AND
WELLBEING
CHAMPION

NICKY JACKMAN
ADMIN AND
DOCUMENT CONTROL

MIKE CLARKE
CUSTOMER CARE
MANAGER

6.0 Existing Services

Identification and protection of buried services is extremely important in particular during the groundwork phase. A further survey will be undertaken of the ground to identify the existing services. A service master plan will then be produced identifying all services including existing and new. During the works a 'permit to locate / dig' will be in place where site management will review the dig position and any relevant survey information.

The existing utility plans have been reviewed and services have been identified close to the CISM Building site.

Gas – an existing gas pipe runs along the existing footpath along the north / west boundaries of the site within proximity of the ISM / ESRI Buildings - further ground investigation will be undertaken to determine the exact depth / location of these services.

Water – existing water mains appear to run along the south and west boundaries of the site - further ground investigation will be undertaken to determine the exact depth / location of these services.

Electricity – a series of low and high voltage electricity cable runs have been identified on the 'Underground Utility Survey' drawing – reference AECOM (Malcolm Hughes Chartered Land Surveyors) drawing – ref: 54812-MH-VUT-Swansea_Unvi_Bay-M2-G-0001 - further ground investigation will be undertaken to determine the exact depth / location of these services.

Communication Cables – underground cables run along the western boundary of the site - further ground investigation will be undertaken to determine the exact depth / location of these services.

Drainage – Foul and surface water mains have been identified within the site boundary of the site - further ground investigation will be undertaken to determine the exact depth / location of these services.

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7.0 Site and Construction Logistics

During the construction of the CISM Building, Kier Construction will employ a Site Manager who will be responsible for logistics; controlling all material delivery, storage and movement in conjunction with the gate man. As well as managing all plant on site to ensure their safe operation. Entry on to the CISM Building / University Campus Site will be controlled by a gateman (located adjacent Gate 1). The gateman will direct vehicles, assist with driver related inductions and ensure that vehicles are held in a dedicated waiting area when necessary.

The Kier Construction Office and Welfare Set Up will be contained within a designated 'safe' area. This controlled environment will not require initial PPE and no work will take place within these restricted / controlled areas. All personnel and / or visitors can do so safely at all times. The compound will be segregated from the main working area by solid fencing panels. All authorised persons will be granted a security tag / pass for gaining access onto the construction site through the designated turn-style, following a site safety induction by Kier Construction.

7.1 Deliveries, Offloading, Lifting and Storage

All deliveries will be co-ordinated and pre-booked giving 24hrs notice. This key element of planning will be implemented during the enabling works (scope to be defined) and throughout the project duration to avoid gridlock situations occurring at critical times along 'Fabian Way'. The gate man will be informed of all pre-booked deliveries and times coming to site. Two way communication systems will be used by Kier Construction (gateman) to keep in constant communication with all relevant parties, in particular the banks and slinger man and sub-contractors site supervisors for offloading and distributing of materials.

Reversing is only permitted under guidance from a trained banksman. The site compound is limitative and will require strict traffic management controls by Kier Construction at all times – Vehicles will access the site off 'Fabian Way' and be held in a designated lay by on Afan Way prior to being reversed onto site by the vehicle marshal through Gate 1, through reversing onto site with a designated marshal this will alleviate vehicles having to reverse back onto the highway following their delivery.

All delivery drivers will be required to sign in and be made aware of the site rules, given a delivery / drivers induction and directed to the correct area of the site. All delivery drivers will require appropriate PPE.

All offloading will be undertaken in the designated offloading bay area within the site boundary. If access is required onto the trailer then a fall prevention system must be in place. Any mechanical offloading example; crane's, hi-ab, forklift and / or moffit's will only be permitted upon receiving a risk assessment and method statement. Any slinger / signaller duties must be undertaken by a competent certified person.

All lifting operations will be subject to an approved lifting plan (Contract Lifts Only) devised by a competent person and approved by Kier Construction. This will include all crane lifts and fork lift operations. Any lifts undertaken outside of the lifting plan will be subject to a 'revised' method statement and risk assessment. All lifting equipment will require six / twelve monthly thorough examinations.

The hoisting of materials using material hoists will only be undertaken when a trained / competent person is available to operate the machinery.

Storage of materials is only permitted within the designated areas and subsequently agreed with Kier site management. All materials **must** be stored neatly and stacked appropriately and accessible when required for use due to the adjacent buildings and confines of the site. Kier plant to utilise "Just-In Time" Deliveries on site and do not plan to store materials any longer than required without being installed.

Waste materials will also be stored within a designated area in line with the site waste management plan. Hazardous materials will be stored in lockable skips. Materials will be segregated in line with our strict targets for this scheme to comply with BREEAM requirements. Chemicals will be located in designated storage areas and gas bottles in suitable cages away from site accommodation and buildings.

7.2 Plant and Machinery

Deliveries of plant will take place on a hardstanding area and will require the presence of a banks man throughout the offloading procedure. All plant and machinery will be subject to weekly inspections by the operator. Any lifting equipment will require up to date thorough examinations. Upon delivery - all plant and machinery will require to have a pre-use inspection undertaken by the competent operator.

Prior to the commencement of works on the CISM Building, it is imperative that all risks are identified by the health and safety information pack issued by the client, estimators, planners and designers and registered on the risk register control sheet. The risk register will remain updated throughout the project as identified.

7.3 Temporary Accommodation and Welfare

The site offices and welfare facilities – See Site Logistic Plans above - The accepted layout will be fully segregated from all construction activities. This will act as a safe zone and operate as non PPE area – access adjacent to the existing ISM Smart Building.

The welfare facilities will comprise of a toilet block, canteen and shower facilities. Cleaning of these facilities will be undertaken daily and regular inspections taking place to ensure standards are maintained at all times.

The site compound and site entrance will be controlled by a turnstile as shown on the site logistics plan adjacent to the welfare set up. Each operative will be issued with access onto site following a site specific health and safety induction in the form of their finger print. The turnstile system will allow the operative access as well as allowing Kier Construction to be aware of who is on site. All operatives will be required to hold a CSCS Card and have the necessary documentation to demonstrate their training and competence.



100% CSCS Compliant

Figure 6: CSCS Card Compliance

Access to welfare facilities will be via a shared public access adjacent to the ISM Smart Building (eastern elevation) The route onto site following the induction will enter the welfare / drying and canteen area to gain access through the turnstile. As the works progress, pedestrian routes will change to align with the construction sequence, but at all times the pedestrian and site vehicular traffic segregation will be in place at all times.

7.4 Waste Disposal

Within the confines of the site, there will be a specific waste segregation area set up. This area will be completely enclosed with access only granted to authorised persons (approved operatives, forklift driver and skip lorry drivers).

The waste compound will have an appropriate number of skips in order to segregate as much waste as possible to reach the target of 95% of waste diverted from landfill.

All targets for waste management will be outlined in the site waste management plan (SWMP). The waste management contractor will be selected dependent on their recycling figures and service offered. The Kier Construction environmental advisor (Kat Rolle / Chris Grimes) will audit all waste management and ensure good practice is maintained at all times as an independent adviser to the site team.

On site we will use wheelie bins to provide adequate waste management and collecting facilities.

Our waste management and targets will be monitored to meet the strict requirements set out in BREEAM process for this scheme.

7.5 Roles and Responsibilities – Environmental Controls

The roles and responsibilities for the personnel who could affect the environmental and energy management of the project are summarised as follows:

POSITION	ROLES & RESPONSIBILITIES
Construction Manager	- Responsible to the Operations Director for the environmental and energy performance of the project and the site. - Provide adequate resources (personnel, financial and technological) to ensure effective development, implementation and review of the Project Environmental and energy Plan and compliance with all applicable environmental and energy legal and contractual requirements. - Establish and maintaining site environmental and energy operational controls, procedures, monitoring and reporting systems. - Ensure that all work is conducted with the minimum of risk to the environment and with a view to improving energy performance. - Ensure that all staff are trained and competent to discharge their environmental and energy duties. - Establish, as appropriate, regular consultation with neighbours on environmental and energy matters, ensuring that notifications are made to neighbours when the works may create a nuisance. - Ensure that site environmental and energy meetings are recorded with staff, clients and subcontractors as and when required. - Ensuing that environmental and energy inspections are conducted at the required intervals.
Kier Group Tech. Services Project / Site Manager	Responsible to the Board of Directors for ensuring that the Sustainability Management System (SMS) is developed, implemented and maintained. - Maintenance of the SMS, including Procedures, Registers and Forms as appropriate. - Point of contact for all environmental and energy related matters relevant to the development. - Review and assessment of the performance of all major subcontractors. - Undertake management of the environmental and energy audits of the project and site. - Assist in the identification and delivery of training needs.
Environment & Energy Management System Adviser (Kat Rolle)	- Provide guidance on the significance of environmental and energy performance. - Provide guidance on objectives, targets and management programmes for each significant environmental and / or energy related aspects. - Provide guidance to employees regarding the SMS. - Train staff with respect to the SMS as detailed by the management representative. - Ensure information relating to performance indicators is collected as required by the management representative. - Undertake or assist with internal audits as instructed by the management representative. - Provide assistance as required to management, including data collection. - Ensure that employees are following their documented SMS work instructions

POSITION	ROLES & RESPONSIBILITIES
Project / Site Managers and Supervisory Staff	Responsible to the Contracts Manager for the performance of the project, and site, including the maintenance of site controls, procedures, monitoring and reporting systems. Developing, implementing and reviewing the Project Environmental & Energy Plan. Ensure all employees and subcontractors are aware of their responsibilities and fully comply with the requirements of Kier Construction SMS and the Project Environmental and Energy Plan. Ensure all environmental and energy regulations, codes of practice and contractual requirements are understood and observed. Co-ordinating Environmental and Energy matters on site. Ensure supervisors and operatives are adequately trained and properly instructed and that no person commences work unless he has received appropriate induction training. Promote and maintain a safe and tidy working environment. Ensure that subcontractors work in accordance with agreed procedures and working methods. Undertake routine inspections of the site. Ensure all accidents and incidents, including spillages, are investigated and reported to the Construction Manager and the 'Environmental Adviser' (Kat Rolle).
All staff	All staff will have a responsibility for their own environmental and energy performance and the impact that they have on Kier performance. Undertake all activities in accordance with the agreed procedures and working methods. Know who to contact regarding environmental and energy matters. Report any activity that has resulted, or has the potential to result, in an environmental incident or deviation from expected energy use. Attend environmental and energy training as required.

7.6 Internal Communication

Effective internal communication of relevant issues pertaining to the project shall be achieved through:

- Routine foreman's / supervisor's meetings
- Monthly management meetings, with environmental and energy management as an agenda item.
- 'Tool Box' talks focusing on environmental and energy management awareness and other related issues for all site staff.
- Site / location notice boards, on which such items such as the Environmental & Energy Policy and Kier Construction Newsletters.
- Formal memos and notices issued to staff as required detailing any changes to site procedures and methods.

7.7 External Communication

Receiving and Recording Complaints

In the event that an environmental complaint being received the **Project / Site Manager** shall document and record the details of the complaint. A separate sheet shall be used for each source of complaint unless the complaint is the same or very similar in nature.

The **Project / Site Manager** shall communicate the complaint to the:

- Contracts Manager (Ian Williams)
- Group Technical Adviser (Chris Grimes)

Responding to Complaints

The **Project / Site Manager** shall ensure that an investigation into the complaint and if appropriate arrange for corrective action to be taken to rectify the situation and undertake preventive action to avoid future occurrence of the complaint. The Complainant shall be advised where possible of the results of the investigation and the nature of any corrective action being taken. The complainant shall also be advised if the investigation identifies that no corrective action is considered necessary.

The **Contracts Manager**, with the assistance of the **Group Technical Adviser**, shall formulate the responsive action to remedy the complaint and shall record the remedial actions in the lower section of the appropriate Complaints Form. The details entered should include the actions to be taken, the person responsible for taking the action and the time-scale of implementation.

Public Liaison

Local residents (limitative – Low Risk) and other interested parties shall be kept fully informed of all current and planned activities that may have a direct impact upon them. This shall be undertaken in accordance with the Considerate Constructors Scheme through:

- Routine residents liaison meetings as and when deemed necessary
- Provision and regular update of information boards
- Encouraging feedback and communication from interested parties

Emergency Response Plan

An Emergency Response Plan for the site will be developed. All contractors working on site shall be made aware of the requirements of the emergency response plan at their site safety induction. The **Project / Site Manager** shall ensure that the emergency response plan is routinely tested.

7.8 Emergency Contacts

Nearest hospital A and E department:	Morrison Hospital Heol Maes Eglwys SA6 6NL 01792 702222 (999)
Police	999
Ambulance	999
Fire (central command)	999
HSE	0845 345 0055
Environment Agency	0800 80 70 60
Welsh Water	0800 052 0130
Western Power	0800 052 0400
Wales and West Utilities	0800 111 999

All numbers to be displayed within the site office and canteen areas.

8.0 Construction Sequencing Strategy

- Setting up the site: Indicative dates to be agreed (August / September 2020)
- Sub Structure Works: Indicative dates to be agreed (September – December 2020)
- Super Structure Works: Indicative dates to be agreed (January 2021 – April 2021)
- External Facades: Indicative dates to be agreed (April 2021 – November 2021)
- Internal Finishes: Indicative dates to be agreed (September 2021– February 2022)
- Commissioning: Indicative dates to be agreed (January – March 2022)
- Client Fit Out: Indicative dates to be agreed (April – July 2022)

Critical activities:

1. Enabling Works and Preparing the site
2. Piling Mat
3. Piling
4. Foundations / ground beams
5. Ground floor suspended bearing slab
6. RC Frame
7. Structural Steel work
8. Roof Finishes
9. External Facades
10. External elevations / - Feature Cladding and Piers
11. Finishes
12. Pre-Commissioning
13. Commissioning
14. Post Commissioning
15. Fit-Out / Re-Commissioning
16. De-Snag
17. Handover

8.1 Site Establishment and Preparatory Works

Site commencement is programmed to commence within the month of September / October 2020 (Piling Operations) – there are extensive enabling works to be undertake in advance of the piling commencing during the Month of July – September 2020 – reference the removal of the existing oracle buildings and landscaping, re-divert and / or protect the existing services and dismantle the timber / brick planters to the north of the service yard in order to form the site boundary lines in readiness of the reduce levels progressing. The first activity will be to undertake the scope of enabling works in order to ensure that the site boundary is fully secured at all times during these initial operations. Permanent hoarding will progress in coordination with the enabling works being finalised. An oasis unit / temporary accommodation will be provided for the initial preliminary activities such as the enabling and sub-structure work packages in conjunction with the provision of the ‘Active Classroom’ facilities for KIER site set-up / welfare facilities during the enabling works.

8.2 Material Distribution and Storage (including Fuel, Chemical and Plant Storage)

Heavy plant will be off-loaded within the designated hardstanding area. A banksman will be in attendance as outlined in our 'deliveries to site procedures'

All plant will be stored within the designated compounds. All refuelling points will have bunds to prevent spillage within the ground / water courses. Spill kits will be set up within the compound along with notice boards displaying emergency contact numbers should there be a spillage incident.

All fuels, oils and chemicals will be stored within these 'Plant Compounds'. Gases stored in locked cages away from the site set up / welfare facilities.

During the frame / super structure works, materials will be distributed to the work areas via a tower crane. Materials for the internal finishes will be distributed via a goods hoist / forklift located along the south elevation of the CISM Building

Tower crane will be used throughout the super structure elements of the building due to the site space limitations / constraints – reference the *RC Frame* activities..

There is limitative structural steel work on the CISM Building with the exception to the structural steel supports on the main entrance facades located on the northern elevation. Perimeter scaffolding (part north and south elevations) and 'MEWPs' will be utilised throughout the scheme for access to the external facades / envelopes.

During the initial weeks of the elevations / facades progressing, the internal floor slabs will also be serviced by forklift. Materials will be distributed by forklifts to the designated hoist located on the south elevation. From the hoist position, the materials will be distributed horizontally from the loading points by pallet trucks.

In advance of the external facades / envelopes being 'closed up', large materials required for the internal finishing trades will be distributed wherever possible onto the floor slabs via a combination of; hoist and telescopic forklift as deemed appropriate.

Sequencing

The sequence of works will commence as follows:-

The ground will be reduced to formation level to accommodate the designed 'piling mat' – these works will commence from the northern end of the site and then progress towards the south boundary.

The piles will initially commence on the CISM Building (northern boundary) and finalise on the gas store building. Piling methodology based upon the latest SI and Ground Investigation Survey / Reports.

The key activity will be to ensure that the piling works are completed during the month of October 2020 due to the vibration being within close proximity to the neighbouring research laboratories / buildings (**ISM – Smart and ESRI Buildings**).

The underground drainage and pile caps will progress from the north boundary of the site and work in an anti-clockwise rotation. The ground floor slab will progress on the critical path to allow the RC Frame to progress thereafter. Tower crane will be sited along the east elevation during the initial ground works and RC Frame programme. Following completion of the R.C Frame (Ground to 2nd and roof level) will enable the temporary back propping to be removed and enable some primary structural steelwork to commence. External cladding support systems will commence upon completion of the RC Frame with temporary formwork being dismantled to allow initial setting out of the cladding system from a combination of MEWPs and independent scaffolding access. Roof structure / finishes will need to be coordinated with the soffit installation along the north elevation of the CISM Building to achieve robust water-tightness.

The construction sequence for the floor slabs will be as follows:

Structure:

Upon completion of the RC Frame, will enable the roof finishes to commence in conjunction with the roof upstands and plant areas initially. The internal stair cases will be installed in-situ and coordination with the RC Frame installation

Laboratory Building:

The CISM building will be completed from the north boundary line to the east boundary for the piling and sub-structure works initially. The super-structure RC In-situ frame will follow the same sequence from ground to roof levels. The only structural steelwork will be the members to support the cantilevered entrance soffits along north elevation of the building. The roofing works will commence upon completion of the back propping being dismantled and safety handrails removed to receive the roof finishes. Activities progressing from the north / east elevations and working towards the south / west elevations.

External Finishes:

The external elevations will mainly consist of proprietary cladding systems. Upon completion of the roof parapet upstands to the roof perimeter will enable the dismantling of the parapet safety handrails / netting then follow and then followed by the works to the external façade commencing on the south elevation, then anti-clockwise until complete

Internal Finishes:

The internal finishes will commence from the upper floors when the structure is substantially watertight. These activities will commence from the second floor and work sequentially down to the ground floor / plant areas of the building. Critical trades being the 1st fix M&E Services and the Dry Lining Works initially, Critical areas such as the M&E risers, plant & boiler rooms, specialist clean rooms will be targeted in conjunction with progressing activities on the second floor in order to promote early pre-commissioning where ever possible.

Project Completion:

Programme completion date being assessed as of July 2022 (Indicative date for the Client fit-out and commissioning works to be developed / agreed)