

LAND SOUTH OF DANTZIC STREET (KNOWN AS VICTORIA RIVERSIDE), MANCHESTER

REMEDIATION STRATEGY

Job Number: LKC 21 1194

Date: April 2021

Client: Henry Construction Projects Ltd



INCREASING LAND VALUE

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LK Consult Document Verification			
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CONTENTS

1	INTRODUCTION	1
2	FURTHER ASSESSMENT OF POLLUTANT LINKAGES	5
3	SITE WIDE CONSIDERATIONS	8
5	BUILD PHASE REMEDIATION WORKS	11

APPENDICES

Appendix A:	Drawings
Appendix B:	Enabling Works 'Cut & Fill' Drawings
Appendix C:	Construction Details Drawings
Appendix D:	Extracts from Previous Site Investigation Reports

1 INTRODUCTION

1.1 Background

LK Consult Ltd (LKC) has been commissioned by Henry Construction Projects Ltd to provide a Remediation Strategy for Land South of Dantzic Street (known as Victoria Riverside), Manchester.

The Remediation Strategy is required to determine the work necessary in order to ensure the site is “suitable for use” for the proposed residential development with regards to potential contaminated land pollutant linkages.

A summary of the site details is presented in Table 1-1. Figures 1 and 2 indicate the site location and boundary. The proposed development, with areas of soft landscaping are shown on Planit I.E Ltd Drawing 1768.1_PLA-XX-XX-DR-L-0005 P09 in Appendix A.

Location	North of Manchester City Centre, to the east of Victoria Station. South of Dantzic Street. Centred at approximate National Grid Reference 384531E 399375N.
Area	Approximately 0.96 hectares.
Topography	Approximately 35 metres Above Ordnance Datum (AOD). Site is approximately level, sloping down towards the north west.
Land Use	<u>Site</u> -Site comprises rough unsurfaced land with a central roadway. <u>Surrounding Area</u> Comprises derelict building and car parking to the east and car parking and industrial units to the north. The train line viaduct borders the site on the south with car parking and industrial units beyond
Proposed Development	Three towers of residential apartments and two blocks of townhouses, with communal landscape area and underground car parking.

Table 1-1 : Summary of site details.

1.2 Previous Reports

The following reports have previously been undertaken on the site by LKC and should be read in conjunction with this Remediation Strategy:

- Preliminary Risk Assessment (PRA) report, undertaken by LKC (Ref: LKC 19 1267-01, dated 20th September 2019).
- Stage 1 Site Investigation Factual Report, undertaken by LKC (LKC 19 1267-02 R0, dated 27th September 2019).
- Phase 2 Geo-Environmental Investigation, Risk Assessment and Remediation Strategy, undertaken by LKC (LKC 19 1267-02 R1, dated November 2019).

1.3 Summary of Previous Work

The site history, site description and environmental setting is described in the LKC Preliminary Risk Assessment and pertinent information is summarised in Table 1-2 below:

History:	Industrial buildings, residential properties and roads present from 1891 mapping. Majority of site replaced by Rubber works by 1922 mapping, annotated 'Works' from 1980 mapping, no longer present from 2003 mapping.
Geology / Hydrogeology:	Made ground across the site. Boulder Clay/Till across S half of the site (Secondary Undifferentiated Aquifer). Chester Formation Sandstone (Principal Aquifer).
Relevant Environmental Setting:	River Irk 13m SW. Nearest Pollution Incident 12m NW. Category 3 – Minor Incident. No surface water abstraction within 1km. Nearest groundwater abstraction 508m NW. Not within Source Protection Zone.
Preliminary Conceptual Model: PL=Pollutant Linkage	PL1 Direct Contact (Human Health): Low Risk (ACMs, Heavy Metals, hydrocarbons, Organic/Inorganic Contaminants); Low Risk (Mineral Oils, PCBs). PL2 Inhalation of Vapours: Low Risk (volatile contaminants). PL3 Gas: Low Risk (hazardous and ground gas). PL4 Controlled waters: Low Risk (mobile contaminants). PL5 Sulphate Attack: Low Risk (sulphate). PL6 Water Pipelines: Low Risk (organic contaminants). PL7 Phytotoxic: Low Risk (metals).
Recommendations:	Limited site investigation was recommended to further assess all the above pollutant linkages

The PRA concludes that there is a low-low/moderate risk from active pollutant linkages and a site investigation was recommended.

The Phase 2 investigation comprised six shallow window sample boreholes, seven 'deep' rotary cored boreholes, twelve trial pits, nine slot trenches (to locate services and foundations) and two soakaway tests.

The site investigation included in-situ geotechnical testing as well as geotechnical laboratory analysis. Chemical laboratory analysis (*inter alia* metals, PAHs, TPH, BTEX, and asbestos). was undertaken on soil samples collected. Five samples of made ground were also scheduled for WAC analysis to allow waste classification to be undertaken. Boreholes were installed with monitoring wells to allow groundwater level monitoring to be undertaken.

Ground conditions encountered during the investigation comprised made ground up to 3.9mbgl. Several areas of large relict foundations/ obstructions associated with the former, aborted, development were encountered. These comprised remnant piles and large concrete pads/bases. Relict foundations such as brick walls, floors, concrete and stone slabs associated with the site's former use were also encountered.

Made ground was a heterogeneous mixture of *'building rubble, plastic, glass, rebar, concrete, brick, scrap metal, wood, rags, etc'*, particularly prevalent near to relict structures.

Potentially putrescible components were noted locally in made ground across the site. No visual/olfactory evidence of hydrocarbon or volatile contaminants were noted, although a hydrogen sulphide type odour was encountered locally in some areas of the site.

Superficial deposits comprised orange to red SAND (probable weathered sandstone bedrock) from 2.2-2.6mbgl. This in turn was underlain by competent sandstone bedrock encountered from 2.6m to >10mbgl.

No groundwater strikes were encountered during the intrusive works. Subsequent monitoring identified groundwater levels at approximately 27mAOD across the site.

The proposed development is for a high rise residential development with limited communal soft landscaping. Therefore, the assessment criteria for residential without plant uptake was used for the risk assessment.

Of the fifteen soil samples collected, lead (5no.), Benzo(a)pyrene (2no.), naphthalene (1no.) and TPH from hazard quotient (1no.) were above assessment criteria. No asbestos was identified in any sample.

No gas monitoring or groundwater quality monitoring was undertaken due to a low risk considered in the PRA, based on the ground conditions and proposed development.

Based on the findings of the Phase 2 Geoenvironmental Investigation and Risk Assessment, the majority of the pollutant linkages were considered to be addressed by the general enabling works and design (cut & fill, tanking etc.) considered likely to be required for the site and therefore limited specific remediation was recommended.

Some ambiguity remained due to final design not having been confirmed at the site investigation stage. The LPA provided comments (refer to Section 1.4, below) requesting clarification once more detail of the scheme had been confirmed. An update to the pollutant linkages based on the updated scheme is included in Section 2 with remediation recommendations in Sections 3 & 4.

1.4 Regulator Comments

Comments from the 'Environmental Health' section of MCC in relation to the LKC Phase 2 site investigation report were provided to the Client's planner via email as follows:

- "1. It has been stated that gas protection measures will not be required. This is based on a previous gas assessment of 3 rounds of monitoring 5 years ago. We will require the details of the initial gas monitoring investigation including a copy of any report used and also details of atmospheric pressure during monitoring to ensure assessment included periods of low and falling atmospheric pressure.*
- 2. A site wide strip to 3 metres below ground level are proposed as part of the development to create the basement car park. As such it has been confirmed that any contaminated material will be removed from site. If any of the current boundary land is to remain or reused, or areas of soft landscaping are not being removed as part of the surface dig then an updated risk assessment and potentially remediation report will be required to confirm the details of any necessary remediation in these areas.*
- 3. We will require a water supplier risk assessment to confirm the type of water supply pipe to be installed"*

1.5 Aims and Objectives

In order to achieve the aims of the Remediation Strategy, the following objectives will be set:

- Maximise sustainability through the use re-use of existing site-won materials during ground works and development.
- Ensure that the design meets with current environmental and waste legislation.
- Use of appropriate environmental controls during the remediation and development programme.
- Segregate and stockpile differing materials for validation testing and appropriate re-use or offsite disposal.

The site remediation works will should include the treatment / removal / processing of geotechnical constraints to the proposed development including relic foundations and hardstanding. However, this is considered out with the scope of this Remediation Strategy.

2 FURTHER ASSESSMENT OF POLLUTANT LINKAGES

Following refinement of the development design and the comments received from MCC EH department, further consideration/ update to relevant pollutant linkage is considered necessary.

Current good practice requires that the findings from a site investigation should be evaluated on a site-specific basis, using a risk-based approach. Risk assessment involves identification and evaluation of the hazards presented by the concentrations of contaminants measured followed by an evaluation of the risks which are associated with these hazards (LMRM¹).

2.1 Pollutant Linkage 1 (Direct Contact)

Elevated PAHs, based on Benzo(a)pyrene as a surrogate marker, and metals (lead) have been identified on site, given the number and location of elevated samples, the contamination is considered to be site wide within the made ground.

The source of the contamination is expected to the ash, clinker, pottery and timber noted in the made ground.

At the concentrations identified, the contaminants are considered to pose a potential risk to future site users (residents) in soft landscaped areas, where made ground may be exposed. The principal pathways are the ingestion pathways (soil and dust) and dermal contact.

While individual TPH band elevations were reported the combined Hazard Quotient in ST8 (0.10-1.10m) is >1, indicating a potential risk.

Based on the above assessment, the probability of PAH, metal and heavy end hydrocarbon contamination affecting site users is likely. With a medium consequence, the risk is considered to be moderate and remediation (clean cover soils in soft landscaping) is recommended.

2.2 Pollutant Linkage 2 (Inhalation of Vapours)

Elevated naphthalene and combined petroleum hydrocarbons were identified in ST8 (0.10-1.10m, approximately 29.46mAOD). The elevated concentrations are associated with the backfilling material around the relict foundations. These contaminants may pose a risk to site users via the inhalation of vapours.

The elevated concentrations are within a horizon of made ground used as back fill above the recent abandoned foundations and identified to contain 'occasional timber'. The concentrations may be attributable to made ground containing general waste (wood, metal, plastic, etc) within the local area. Made ground will be grubbed out as part of enabling works. Such material is likely to be removed as part of enabling works and reduced levels, thereby removing most of the source of potential volatile contaminants. The site enabling works fill level plan and cross sections are included in Appendix B. .

In addition, it is understood that the development will include underground parking, bike storage and plant rooms. Examples of waterproof design for the development in included on construction details drawings included in Appendix C. It is considered that tanking required for waterproofing, combined with ventilation requirements will provide sufficient vapour protection.

¹ Land Contamination Risk Management (LCRM) <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

2.3 Pollutant Linkage 3 (Hazardous Gas)

Gas monitoring was not undertaken during the site investigation. A low risk was identified in the preliminary contamination conceptual model for gas (pollutant linkage 3). A previous investigation undertaken in 2015 by CC Geotechnical reported:

“From the 3no. gas monitoring visits included in the report recorded no methane within the boreholes and a maximum concentration of carbon dioxide 1.5%v/v. Maximum flow was recorded as <0.1l/hr. A worst-case gas screening value of 0.015l/hr was calculated for CO₂...However, if the composition and flow rate remain consistent with those recorded to date, gas protection will not be required in future buildings.”

Relevant extracts of gas monitoring data from the CCG report are included in Appendix D. Data indicates the site should be considered Characteristic Situation 1 and no specific gas protection is required.

While organic/ potentially putrescible made ground was encountered during the site investigation works, the majority of this material is shallow and likely to be removed as ‘unsuitable for reuse’ as part of enabling works under a watching brief.

The conceptual model for the site identified the main potential source of ground gases as potentially putrescible material within the made ground. As described in the SI report, the enabling works will comprise grubbing out of in-ground structures and replacing material as engineered fill. Wilson and Card et al² states:

“...high concentrations of methane are normal in engineered fill containing silts or clays, and that it did not pose a hazard to structures (California Environmental Protection Agency, 2012)...methane gas testing on hundreds of earthworks projects ...found the soils in cut areas did not contain methane, but material from cuttings that was placed as engineered fill contained high concentrations of gases consistently exhibiting microbial characteristics (up to 40% methane)...the high methane poses no risk to buildings constructed on the fill.”

The proposed enabling works and ground conditions at the site are analogous with the above scenario.

Moreover, as described in Section 2.2, the development includes car parking, bike parking, and plant rooms which require water proof tanking which should be adequately ventilated. This is considered more than suitable protection from ground gases at the site.

Based on the above, a watching brief and removal of unsuitable ‘general waste’ and putrescible material as part of the enabling works is considered suitable when combined with proposed waterproofing (refer to drawings in Appendix C) and no specific gas protection is required.

2.4 Potable Water Supply (Pollutant Linkage 4)

Elevated concentrations of petroleum hydrocarbons and TVOCs were identified during the SI. Once details of the pipeline location and depths are known, a UU Risk Assessment should be undertaken and additional testing may be required.

Barrier pipe may be required.

² Geoff Card, GB Card and Partners; James Lucas, The Environmental Protection Group; and Steve Wilson, EPG “Technical paper: Risk and reliability in gas protection design – 20 years on” (August 2019).

2.5 Summary of remediation and validation requirements

LKC consider the remediation works may be spilt in to the 'pre-construction' (or enabling works) phase and the 'build phase' (i.e. during the development works) phase.

The following earthworks, remediation and validation required for this site are presented in Table 2-1. More detail of proposed works will be provided in the following Sections.

Phase	PL	Remediation Requirements	Validation Requirements
Pre-Construction	ALL	<u>Earthworks Inspections / Unexpected Contamination</u> The relevant contractors should be briefed that during development works at the site should any unusual ground conditions and / or visual or olfactory evidence of contamination (including asbestos containing material) be encountered at the site, LKC and the Local Authority should be informed, and further assessment of the material may be required. Material should be stockpiled and quarantined on visqueen and covered.	Log of work undertaken including photographs. Details of any sampling undertaken and validation of any potential additional remedial work.
	2 & 3	<u>Gas & Vapour Protection Measures</u> Removal of general waste in made ground and areas of geotechnically unsuitable putrescible material. Suitable waterproofing and ventilation as per design drawings.	Supply and review of foundation designs. Photographic evidence of enabling works.
Build Phase Construction	1	<u>Environmental Cover System</u> 450mm thick environmental cover system comprising: <u>Either</u> 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 350mm comprising clean inert fill and sufficient topsoil for a growing medium. <u>Or</u> geotextile membrane and at least 450mm comprising clean inert fill and sufficient topsoil for a growing medium.	Measuring depth of environmental cover system using a staff and providing photographic evidence. Photographic evidence of the granular physical break or geotextile layer will also be collected. Chemical validation of imported soils: See Section 5.3.
	4	<u>Potable Water Pipes</u> It is recommended that a Water Pipeline Assessment is undertaken once the location and depth of potable water pipes are known. It is likely that barrier pipe will be required.	Delivery Notes of Pipe Material or Photographs of the Installed Pipe.

Table 2-1: Remediation and validation requirements

Note: PL = Pollutant Linkage

3 SITE WIDE CONSIDERATIONS

3.1 Construction Management Plan and Health and Safety

A Construction Management Plan and Method Statement should be produced which details appropriate Health and Safety measures to be employed during the site works.

Risks to site workers and adjacent receptors from contamination present in the site soils can be easily mitigated by good environmental management of the site during site works. Standard health and safety precautions (as per HSE guidance³) should be adopted by all workers involved with site enabling and construction works.

3.2 Asbestos Management

Despite no ACM being identified during the site investigation there remains a risk from asbestos in made ground. It is recommended that additional precautions are taken during site clearance, earthworks and construction in the area of concern. The presence of asbestos in the made ground at the site presents a potential risk of generation of airborne fibres if this material is disturbed, such as for excavations to construct new foundations.

This risk can be managed by careful procedures and site monitoring to reduce the risk of airborne fibres, such as wetting techniques and it is recommended that an appropriate 'Asbestos Management Strategy' is developed if encountered during the works and adopted for all intrusive ground works which disturb the made ground in the area of concern. This should be carried out in line with CIRIA C733.

This may include asbestos awareness training for all site staff, provision of suitable personal and respiratory protective equipment and air monitoring.

With regards to cement bound asbestos, this can be handpicked, doubled bagged and disposed of appropriately to a licenced landfill. Guidance on removing asbestos cement is described in HSE (2012).

If ACM is identified in soil arisings then soil should be placed directly into covered skips and disposed of at a suitable licenced landfill, after further testing to quantify the extent of asbestos contamination of the soils. It should be considered that blue asbestos is notifiable (if present) and must be removed by a licenced contractor.

Given that visible pieces of ACM were identified in TP104, TP18 and TP112, it is recommended that hand picking of the ACM is undertaken in these areas. The ACM should be doubled bagged and disposed of accordingly.

3.3 Earthworks Inspection/ Unexpected Contamination (Watching Brief)

The relevant contractors should be briefed that during development works at the site should any unusual ground conditions and / or visual or olfactory evidence of contamination (including asbestos containing material) be encountered at the site, a suitable geo-environmental consultant and the Local Authority should be informed, and further assessment of the material may be required.

Any soils deemed to be impacted by contamination based on visual / olfactory evidence should be excavated and removed. Impacted soils should be placed on an impermeable surface to await removal from site (this may be subject to chemical testing to confirm suitable waste facility) or further treatment. The work should be done under the supervision and instruction of an environmental consultant.

³ HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land" London HMSO.

Soil samples will be taken and analysed for a suite of contaminants, including inter alia heavy metals, Soil Organic Matter, VOCs, SVOCs, BTEX, TPHCWG and asbestos. Soil samples should represent the impacted material. In order to determine that significantly impacted soils have been removed, verification samples will be collected from the base and sides of the excavation. If all impacted ground cannot be removed and contamination remains on the ground, further remediation may need to be considered.

Particular attention should be given to backfilling material around remnant foundations where made ground was noted to contain general waste with timber, metal, plastic, etc. This material should be picked and segregated into appropriate waste streams.

3.4 Materials Management

If materials are to be excavated and re-used on site or materials imported from another site a Materials Management Plan (MMP) will be required (depending upon the volume of material). This will refer to the proposed remedial and validation works as detailed in this document and set out the proposals for re-use, off-site disposal and proposed import of materials for the development. The MMP will be refined as required following approval of the remedial strategy and as the site works progress. This will be produced following the determination of the earthworks strategy and movement volumes by the contractor. This work will be underpinned by the CL:AIRE Code of Practice using a Qualified Person. Upon completion of the works a separate MMP validation report will be produced.

An appropriate permit will be required to allow processing of recycled aggregate and the deployment notification should be presented to the Local Authority prior to commencement.

Re-use of material should be compliant with appropriate legislation. A U1 Standard Rule Permit (U1 exemption) can be registered and allow up to 1,000 tonnes (approximately 600m cube) of non-hazardous soil, up to 5,000 tonnes (approximately 3,000m cube) of material within construction and up to 50,000 tonnes (approximately 25,000m cube) of bituminous and road sub-base in the construction of roads.

A T5 Standard Rule Permit (T5 exemption) allows the screening and recovery of 5,000 tonnes (approximately 3,000m cube) of material, such as concrete or brick for re-use in construction.

Sampling of all re-used / imported material should ensure material is 'suitable for use' and should not be classified as waste (see Table 5-1).

3.5 Grubbing Out In-ground Structures

Numerous obstructions were encountered during the investigation, ranging from shallow concrete and brick to obstructions present deeper within Made Ground. Relict features including concrete pile and large pads. It is recommended that in-ground structures are grubbed out as part of the groundworks.

Hard materials can be used to generate suitable aggregates for re-use on site as part of engineered made ground and/ or construction platforms (subject to geo-environmental testing and client design specifications).

3.6 Stockpile Management

Stockpiled material should be suitably managed. The source of each stockpile should be recorded and appropriate validation testing for the proposed re-use or potential offsite disposal should be undertaken as required. Depending on the nature of the material the potential for dust generation or release of asbestos fibres will be mitigated by dampening down and covering as required.

Material should be segregated by type and source. For example, construction / demolition arisings, site won topsoil and site won subsoil.

A quarantine area for suspect contaminated soils should be established on site. This should comprise a Visqueen (or similar) lined area with a small bund to prevent run off and to minimise the risk of contaminating other areas of the site. The material should also be covered to minimise the generation of vapours, fibres, dust and possible nuisance to adjacent receptors, and to prevent rainwater ingress which may mobilise soluble contaminants.

3.7 Disposal

If any made ground or natural material is required to be removed from site this should be undertaken under an appropriate duty of care and the results of chemical analysis should be provided to a licensed landfill for confirmation of waste classification.

Waste records such as disposal tickets and waste carrier licences should be provided in the Site Completion Report.

The majority of the development site is considered non-hazardous waste with regards to disposal.

5 BUILD PHASE REMEDIATION WORKS

5.1 Introduction

The scope of the build phase remediation works will comprise the following:

- Validation of any imported material required to raise levels;
- Validation of subsoil and topsoil used in areas of soft landscaping;
- Inspection of environmental cover system thickness and construction;
- United Utilities risk assessment for potable water pipes and installation of barrier pipes, as required.

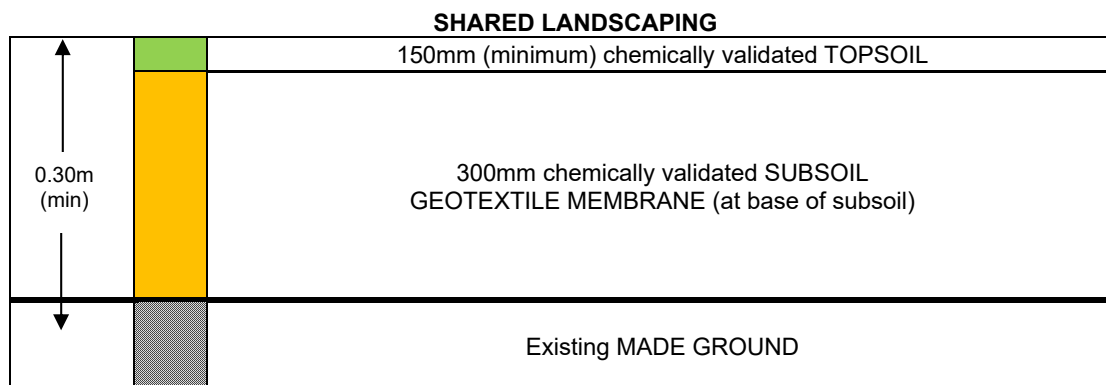
Further details are given in the following Sections. LKR recommend that the proposed works are prior approved by the regulators (and United Utilities, as required) prior to the commencement of construction works.

LKC recommend that the proposed works are prior approved by the regulators (and United Utilities, as required) prior to the commencement of construction works.

Once this strategy is approved, a Remediation Statement and Validation Checklist will be provided to the relevant parties on site which summarises the required remedial works and trigger points for inspections and validation works.

5.2 Environmental Cover Layer to Gardens and Soft Landscaping Areas

An environmental cover layer is required in all soft landscaping areas. There are no private gardens proposed and all soft landscaping will be shared and maintained. A cover layer should comprise a depth of at least 450mm in shared landscaping areas. A typical construction detail is provided below (the geotextile membrane can be substituted in favour of 100mm clean stone break layer).



5.3 Validation of Subsoil, Topsoil and Physical Break Layer Materials

Chemical validation of all site won and any imported soils and any recycled stone to be used on site in the environmental capping layers and/ or infrastructure should be undertaken. Imported soils should be accompanied by a certificate of analysis and source details.

A summary of the required imported material sampling requirements are presented in Table 5-1.

Ideally, the material should be sampled at source to prevent double handling if soil fails, with confirmatory sampling undertaken on importation to site as per the Manchester City Council guidance.

Material Type	Source	Suite of Analysis	Sampling Rate (min. 3 per source) *		
			Garden	Landscape	Other **
Topsoil / subsoil / Fill material	Greenfield	Suite A	200m ³	200m ³	200m ³
	Remediated	Suite A / B dependent upon original SI	100m ³	150m ³	200m ³
	Brownfield / Unknown	Suite B	50m ³	150m ³	200m ³
Quarried Fill	First Generation i.e. quarried sand (subsoil) or stone (break layer)	No testing is required. Certification of material provenance is required.			

Table 5-1: Sampling requirements for imported soils.

Notes:

Suite A - Heavy metals, pH, water soluble sulphate, speciated PAH, soil organic matter and asbestos screen.

Suite B - Heavy metals, pH, water soluble sulphate, speciated PAH, phenol, total and free cyanide, soil organic matter, asbestos screen, banded petroleum hydrocarbons (TPH CWG), BTEX, MTBE.

** Other assumed to be stone / 6F2 etc.

Remedial targets will be based upon the following hierarchy:

- Category 4 Screening Levels (C4SLs).
- LQM Suitable 4 Use Levels (S4ULs).
- ATRISK Soil Screening Values (SSVs) and CL:AIRE Generic Assessment Criteria (GACs).

Where no C4SLs have been generated LKC will use the LQM S4ULs⁴. Similar assumptions and land uses to C4SLs have been used. However, toxicological information has been based on 'minimal risk' as per previous guidelines and assumptions^{5,6,7,8}.

If contaminants are not present as C4SLs and S4ULs then LKC will use ATRISK SSVs or CL:AIRE GACs⁹. These follow the 'minimal' risk principal and more stringent exposure parameters and will be conservative.

The proposed development comprises areas small areas of shared soft landscaping. Therefore, the assessment criteria for POS_{resi} soil criteria will be used for the environmental capping layer now final development layout has been confirmed

All criteria have been generated using the CLEA V1.06 model¹⁰ based on 1%, 2.5% and 6% Soil Organic matter (SOM). Where appropriate, results will be compared to the nearest appropriate SOM.

Any soil with visual or olfactory evidence of hydrocarbons or asbestos containing material should be rejected.

In addition, it should be ensured that the matrix of the topsoil is suitable as a growing medium and no undesirable material is present (in line with BS3882¹¹). This should be the responsibility of your designated soil supplier.

Validation testing certificates shall be collated and included in the Validation Report.

⁴ LQM (2014). "The LQM/CIEH S4ULs for Human Health Risk Assessment."

⁵ EA (2008). "Updated Technical Background to the CLEA Model." Science Report – SC050021/SR3.

⁶ EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.

⁷ EA (2008). "A Review of Body Weight and Height Data used within the Contaminated Land Exposure Assessment Model (CLEA)." Project SC050021/Technical Review 1.

⁸ EA (2009). "Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values." Science report SC050021/SR7.

⁹ CL:AIRE (2009). "The Soil Generic Assessment Criteria for Human Health Risk Assessment."

¹⁰ EA (2008). "CLEA Software (Version 1.05) Handbook." Science Report – SC050021/SR4.

¹¹ BS (2015). "Specifications for Topsoil and Requirements for use." BS3882:2015.

5.4 Capping Layer Depth Validation

Photographic evidence of the correct construction and appropriate depth of the capping layer shall be collected for inclusion in the Validation Report.

5.5 Potable Water Supply Pipes

A UU risk assessment should be completed once the pipe routes and depths are known. It is likely that barrier pipe will be required for some parts of the site.

In the likely event that barrier pipe is required, the risk assessment should be approved by UU prior to any installation works. It should be noted UU would not connect site potable pipework to the main supply unless satisfied the correct pipework had been installed.

For the purposes of the Validation Report photographs illustrating the installation of barrier pipe are recommended.

5.6 Reports

All the remediation and validation work should be documented in a Site Completion Report. The following Completion Reports will be provided to satisfy the outstanding contaminated land planning conditions:

- » Pre-construction Phase Completion Report: Site level reduction details, offsite disposal information, findings of the watching brief, validation testing of site won materials for re-used, including any site generated subsoil to be used in soft landscaping.
- » Build-phase Construction Completion Report: Gas membrane validation, validation testing of any imported topsoil, completion of UU potable water supply document and/or discussion with UU.

The aim of the completion reports will be to demonstrate to the Local Authority that the site has been suitably remediated to the extent that construction works may commence and, in accordance with the National Planning Policy Framework (NPPF)¹²:

- » The site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;
- » After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990¹³; and,
- » Adequate site investigation information, prepared by a competent person, is presented.

Once the above is satisfied the Local Authority should be able to discharge all the relevant contaminated land conditions.

¹² DCL (2018). "National Planning Policy Framework." Department of Communities and Local Government.

¹³ Defra (2006). "Environmental Protection Act 1990: Part 2A Contaminated land." Defra Circular 01/2006.

APPENDIX A

Drawings

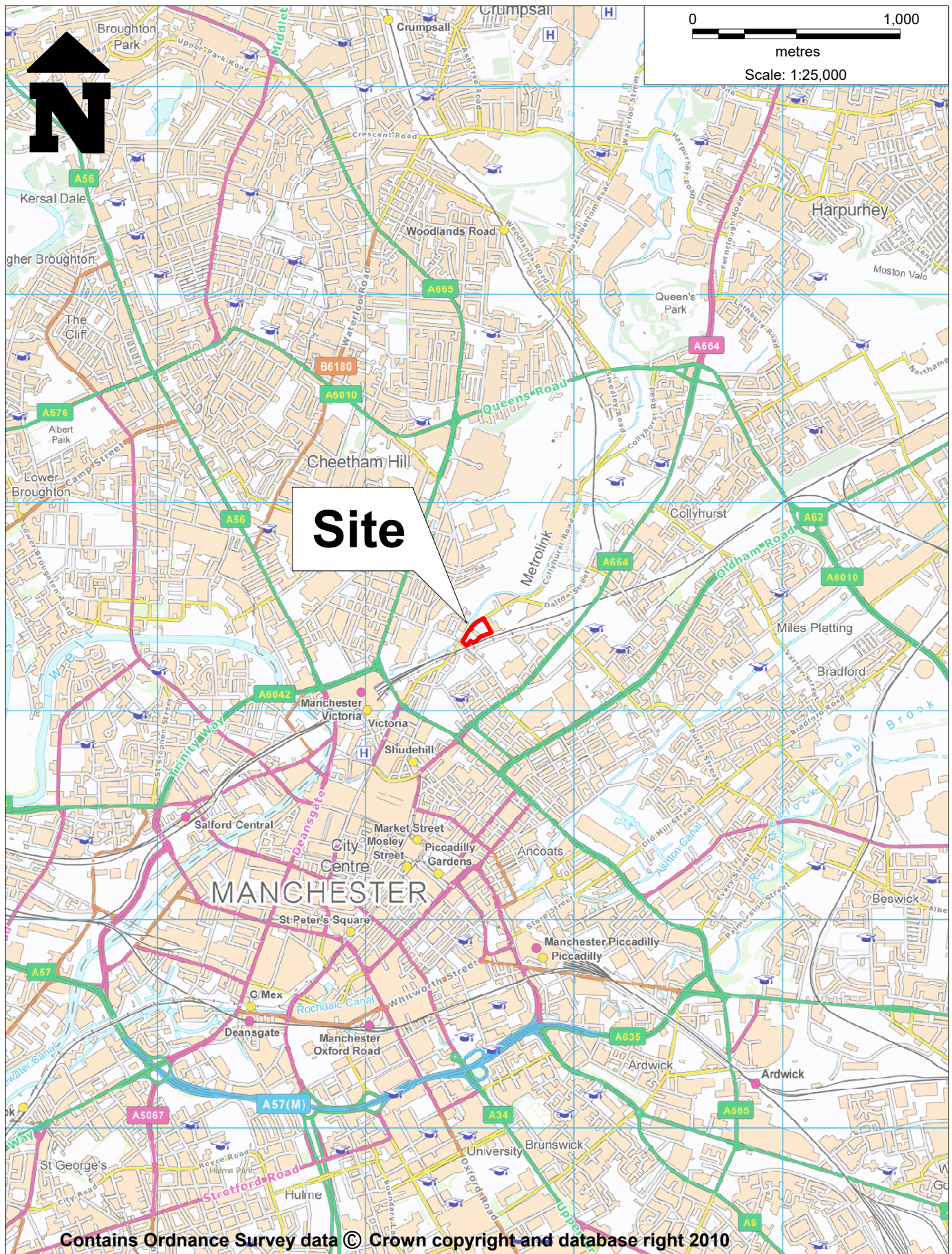
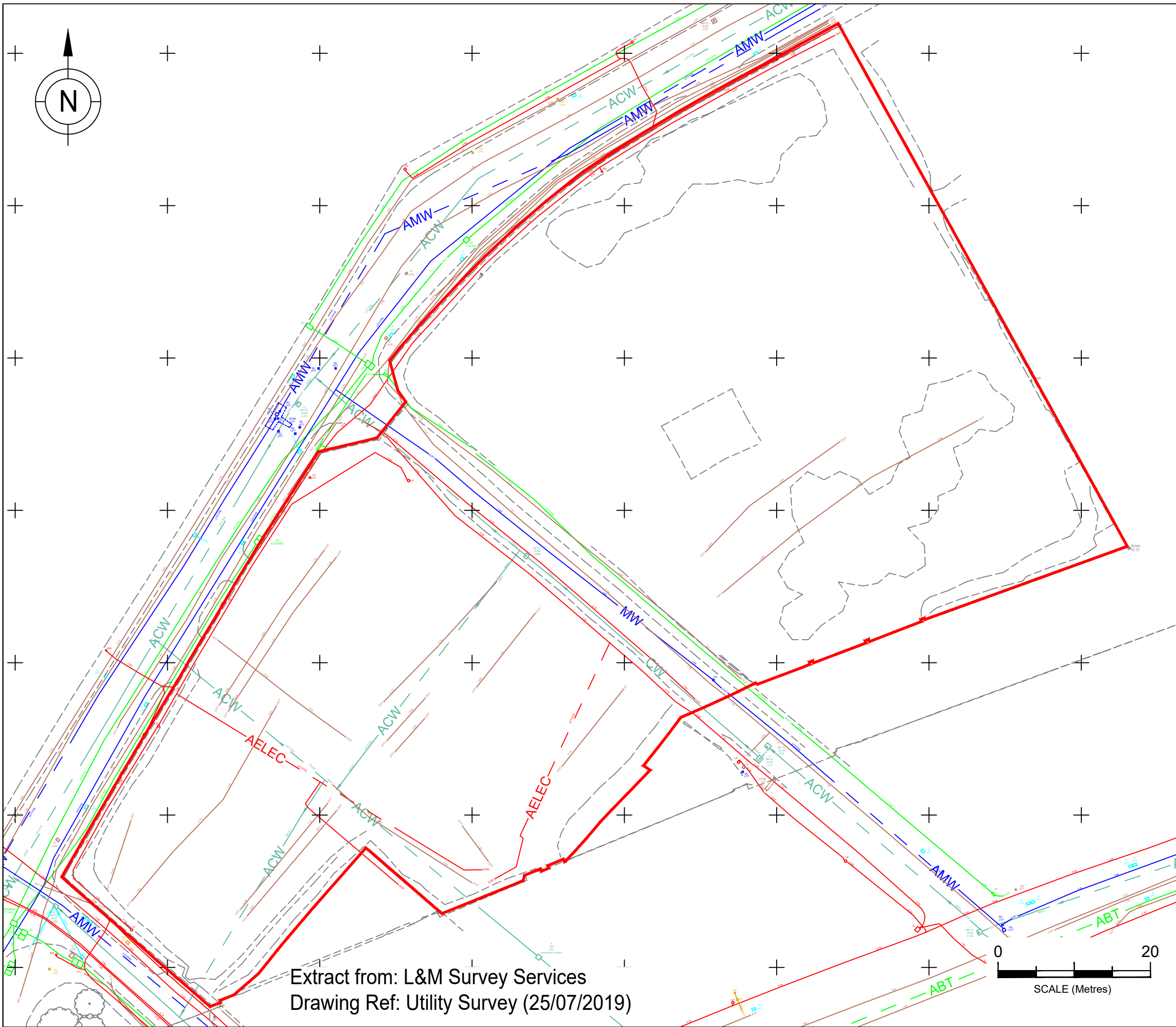


Figure 1: Site Location Plan, Victoria Riverside, Danzic Street, Manchester

Drawn: Sep 2019 Scale: 1:25,000 @ A4 (see scale bar)



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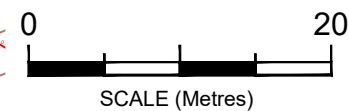
 Site Boundary

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.



Client: Far East Consortium Ltd			
Site: Victoria Riverside, Danzic Street, Manchester			
Title: Site Boundary Plan			
Job No.: LKC 19 1267	Scale (See Scale Bar): 1:500 @ A3	Figure: 2	Revision:
Drawn By: AC	Checked By: PD	Drawn: Sep 2019	

Extract from: L&M Survey Services
Drawing Ref: Utility Survey (25/07/2019)





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- NOTES:
1. Do not scale from this drawing.
 2. Always work to noted dimensions.
 3. All dimensions are in millimetres unless otherwise stated.
 4. All setting out, levels and dimensions to be agreed on site.
 5. The dimensions of all materials must be checked on site before being laid out.
 6. This drawing must be read with the relevant specification clauses and detail drawings.
 7. Order of construction and setting out to be agreed on site.

Red line boundary

For hardwork keys refer to drawings:
1768.1-PLA-XX-XX-DR-L-1000
1768.1-PLA-XX-XX-DR-L-1001

For softwork keys refer to drawings:
1768.1-PLA-XX-XX-DR-L-2000
1768.1-PLA-XX-XX-DR-L-2001

S4-P09	06-11-20	Tender	AT	GB
S4-P08	15-10-20	Tender	AT	GB
S4-P07	07-10-20	Draft stage 3 info	AT	AT
S4-P06	05-05-20	Planning	AT	AT
S4-P05	24-04-20	Planning	AT	AT
S4-P04	15-04-20	Planning	AT	AT
S1-P03	28-02-20	Comment	HT	GB
S1-P02	06-12-19	Comment	AT	GB
S1-P01	11-07-19	DRAFT landscape proposals	AT	GB

Revision	Date	Description	Drawn	Apprvd.
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Planit I.E. Limited
E: info@planit-ie.com W: planit-ie.com
MANCHESTER
2 Back Grafton St., Altrincham, WA14 1DY
T: 0161 928 9281
LONDON
Unit 6 Waterside, 44-48 Wharf Road, London, N1 7UX
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LIVERPOOL
No. 8 Princes Parade, Princes Dock, Liverpool, L3 1DL
T: 0151 705 6746

Client FEC

Project Victoria Riverside Northern Gateway

Drg Title Landscape masterplan

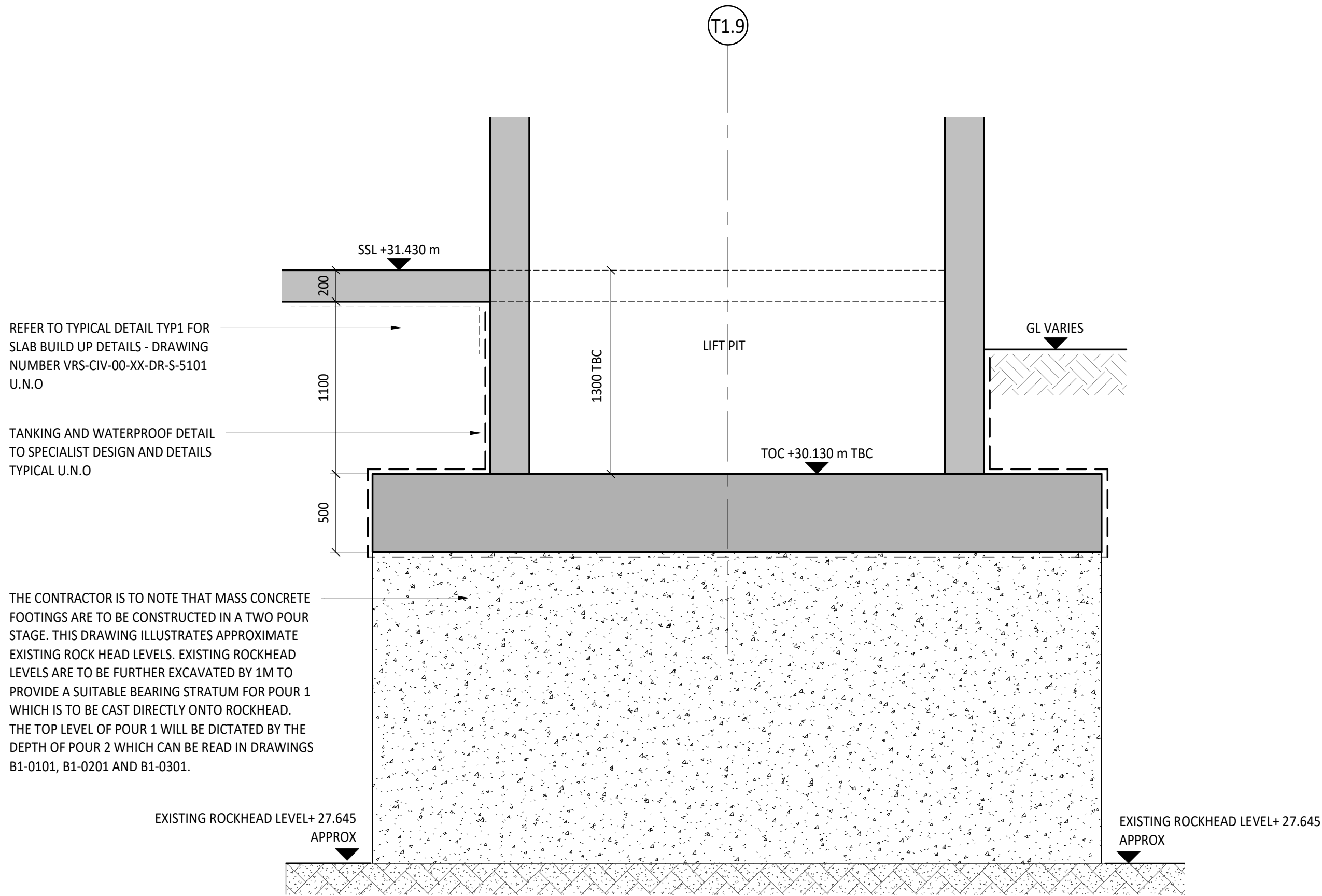
Created on	Created by	Approved by
17.06.19	AT	GB

Scale	Size	Workstage
1:250	A1	Tender

Drg No.	Suitability	Revision
1768.1-PLA-XX-XX-DR-L-0005	S4	P09

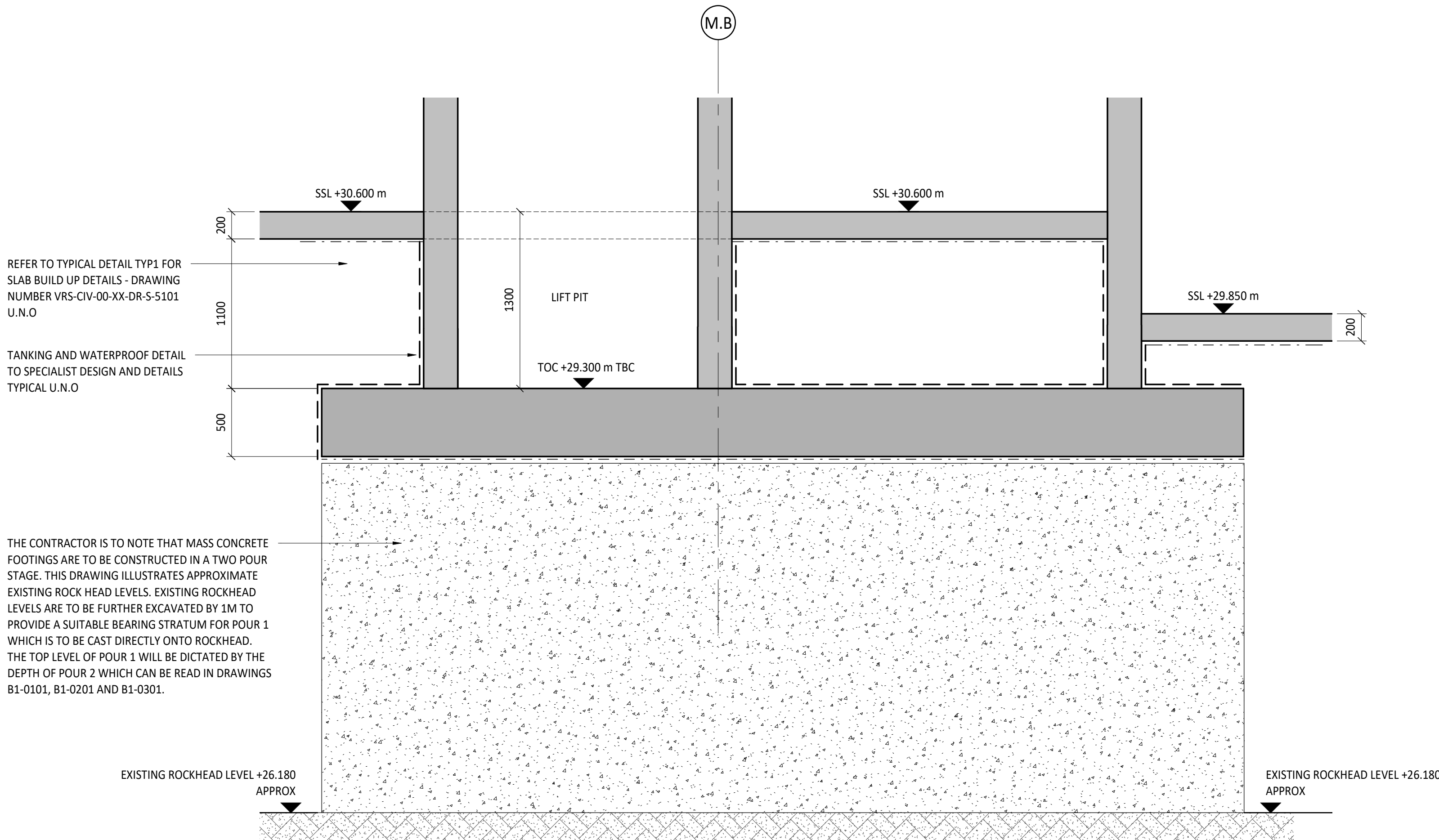
APPENDIX B

Enabling Works ‘Cut & Fill’ Drawings



SECTION TH1 - LP4

SCALE: 1 : 25 @ A1

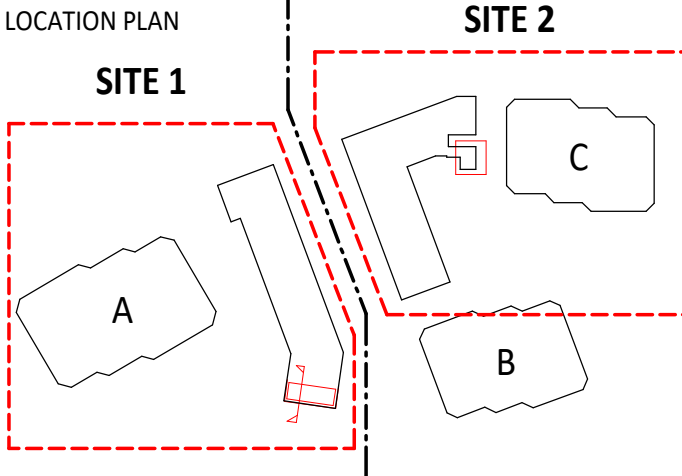


SECTION TH2 -LP5

SCALE: 1 : 25 @ A1

- STANDARD NOTES
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 5. ALL DIMENSIONS IN mm, ALL LEVELS IN m U.N.O.

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NOTES

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20.11.20	P01	STAGE 3B ISSUE	MJF	DP
Date	Rev	Description	Drawn	Chkd



MANCHESTER Carver's Warehouse, 77 Dale St, Manchester, M1 2HG. Tel: 0161 228 6757
LONDON Reeds Wharf, 33 Mill Street, London SE1 2AX. Tel: 020 7253 2977
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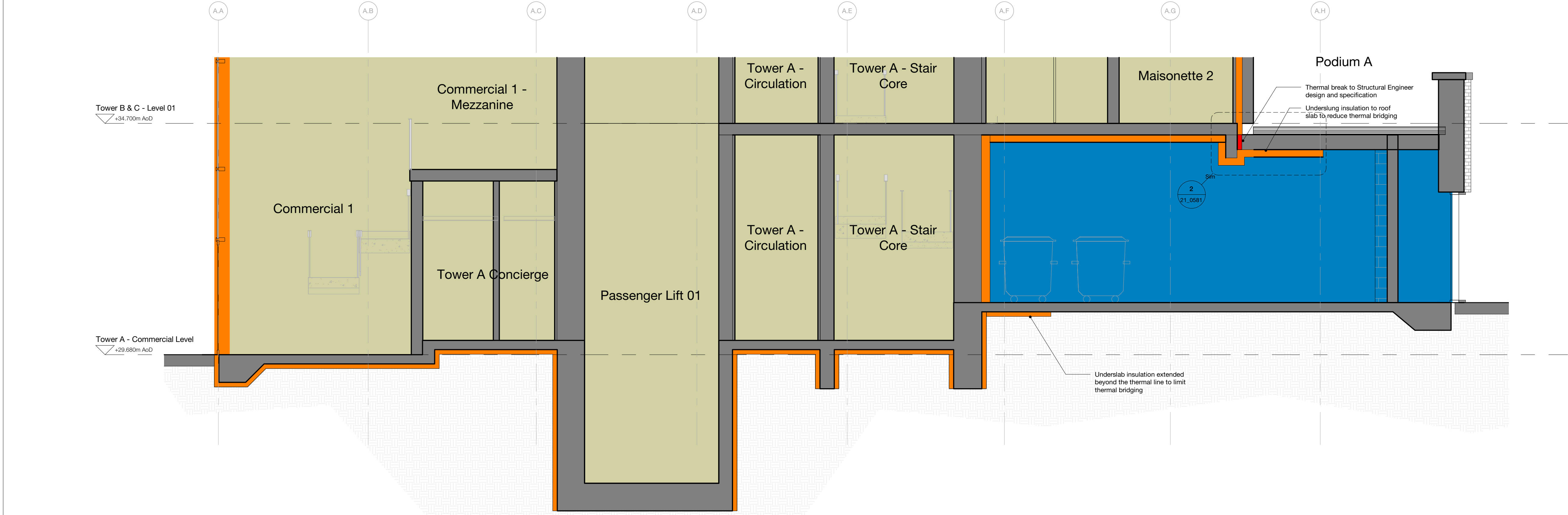
Project

VICTORIA RIVERSIDE, DANTZIC STREET
MANCHESTER

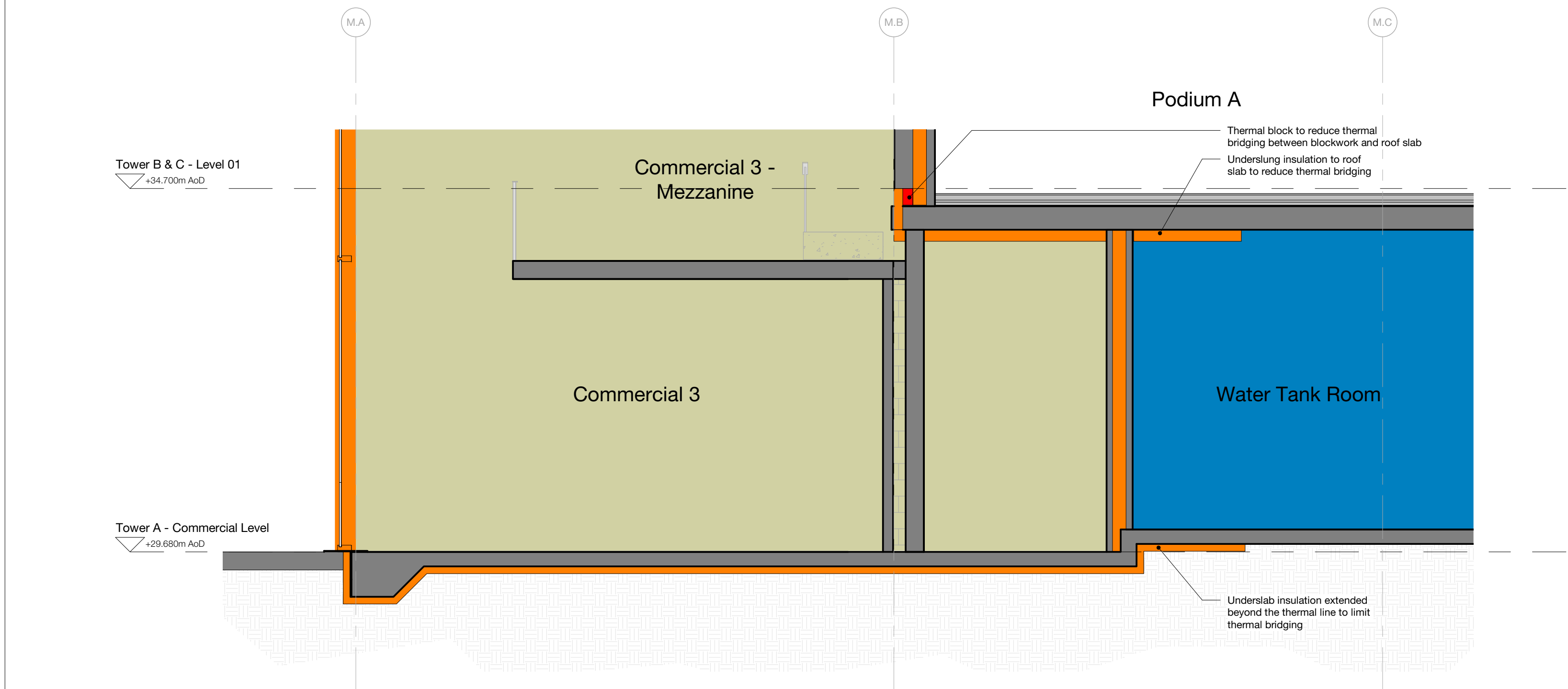
Title

SUBSTRUCTURE DETAILS SHEET 3

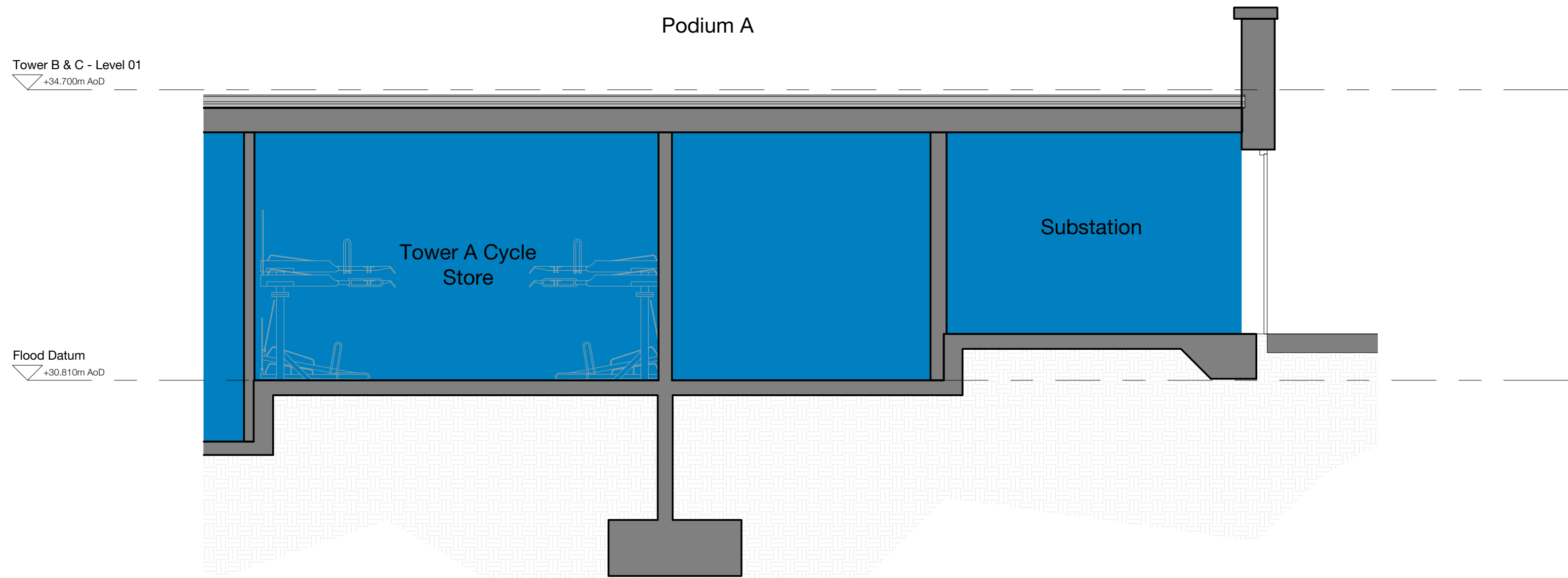
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Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1127-01	1:25	Oct 20	MJF	DP	S1
Drawing Number				Revision	
VRS-CIV-00-XX-DR-S-5103				P01	



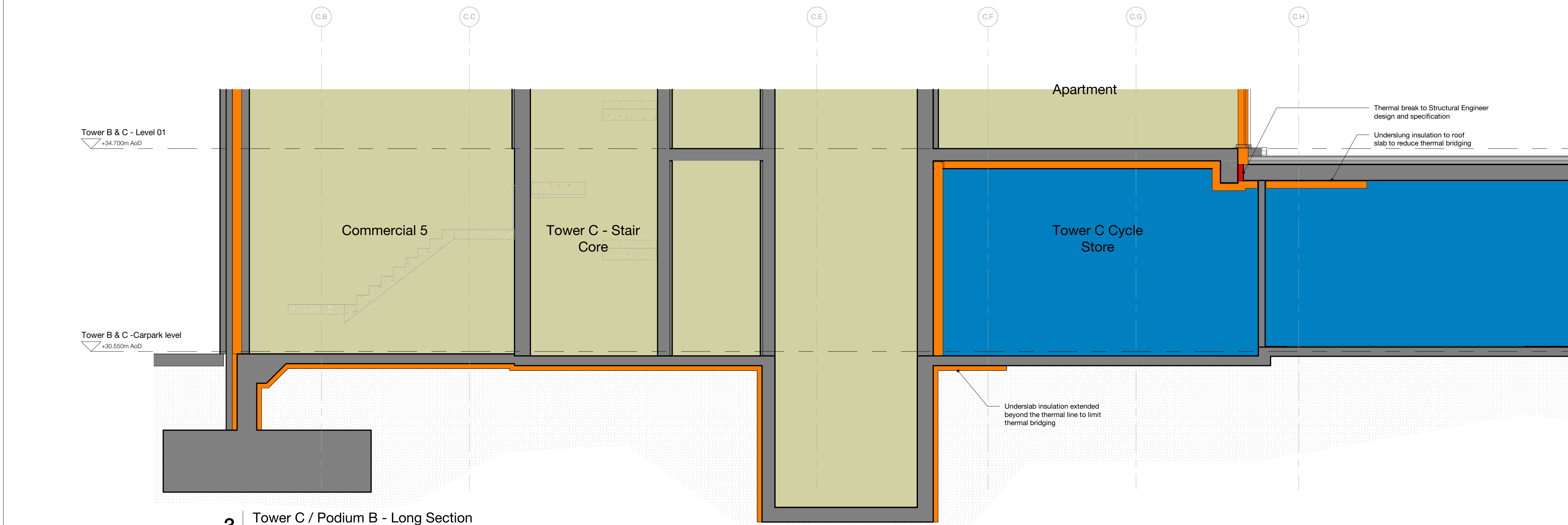
1 Tower A - Short Section
1 : 50



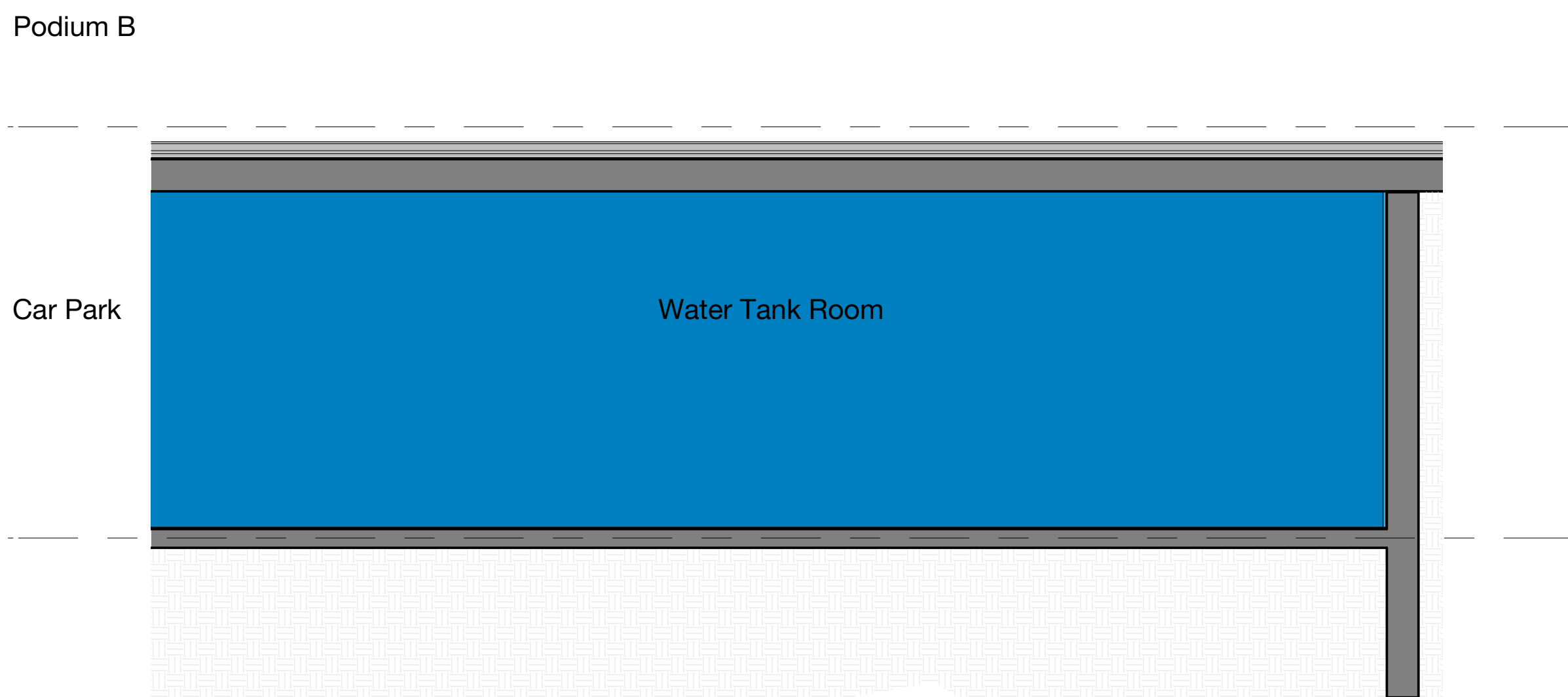
2 Midrise Block M1 - Short Section
1 : 50



4 Podium A - Short Section
1 : 50



3 Tower C / Podium B - Long Section
1 : 50



Environmental Design Requirements:-

The below setout the requirements for the grade of the Basement / Internal Spaces using the classifications from *BS 8102:2009 'Code of Practice for Protection of Below Ground Structures Against Water From the Ground'*. This drawing outlines the performance requirements which should be designed to by the Waterproofing Design Specialist (see Waterproofing Systems Design Responsibility below), as below:-

	GRADE 3
	GRADE 2
	GRADE 1

Extract from NHBC guidance website on the use of BS 8102 gradings for different uses within new buildings:-

Grade	Description	Generally required for:
GRADE 3	No water penetration acceptable and a dry environment provided where maintained by adequate ventilation	Habitable accommodation
GRADE 2	No water penetration is acceptable although damp areas are tolerated	Non-habitable areas, such as car parks, storage or plant rooms where the internal finishes are not readily damaged by moisture
GRADE 1	Some seepage and damp areas are tolerable, dependent on intended use	Retaining walls typically used to form external lightwells

Vertical Thermal Line

The thermal line has been indicated on the scoping drawings to demonstrate the thermal strategy for the facade design. Please refer to the 21 and 22 Series for the External Wall and Internal Wall Packages which describe the detail and specification.

	Thermal Line
	Underslab insulation extended beyond thermal line

Flood Defences

A strategy of permanent and temporary flood defences are proposed. Please refer to DWGs Z1_0591 and Z1_0597 for details.

	Internal concrete upstand
	Demountable barrier

Site Conditions:-

Site gas characteristics is CS1 with recommendation to fully tank and ventilate the proposed underground car park. Please refer to Phase 2 Site Investigation Report by LK Consult for further finding on site conditions and recommended provisions.

Waterproofing Systems Design Responsibility:-

Waterproofing systems should be designed by a waterproofing design specialist. Designers who have successfully completed the Certified Surveyor in Structural Waterproofing (CSSW) qualification available from the Property Care Association (PCA) are generally acceptable to NHBC. An alternative demonstration of competence may be acceptable, subject to successful review with the NHBC.

The waterproofing design specialist should be appointed in the early design stages to co-ordinate with other designers, including the engineer, and to ensure satisfactory integration of the waterproofing system.

Design and specification information should be provided to NHBC at least eight weeks in advance of the works starting on site, in accordance with NHBC Rules.

Risk-based Design Requirements:-

The below waterproofing performance requirements are in accordance with NHBC guidance note 5.4 on *Waterproofing of basements and other below ground structures*, which should be consulted for further information:-

Combined systems should be used where:

a Grade 3 environment is needed, and the wall retains more than 600mm

The following Types of waterproofing are acceptable where a Grade 2 environment is needed and more than 600mm of ground is retained:

Type A fully bonded barrier - Type A barrier that forms part of a composite structural wall, including liquid applied and cementitious systems. Post-applied sheet membranes are not considered to be fully bonded barriers

Type B - the water-resistant properties of the retaining structure providing waterproofing to the building. This chapter provides specific guidance for the use of Type B concrete systems cast in-situ, with or without waterproofing admixtures. The principles are applicable to other Type B systems listed in BS 8102

Type C - Construction that incorporates a cavity, generally formed with a cavity drain membrane. Water is removed from the cavity via a managed drainage system

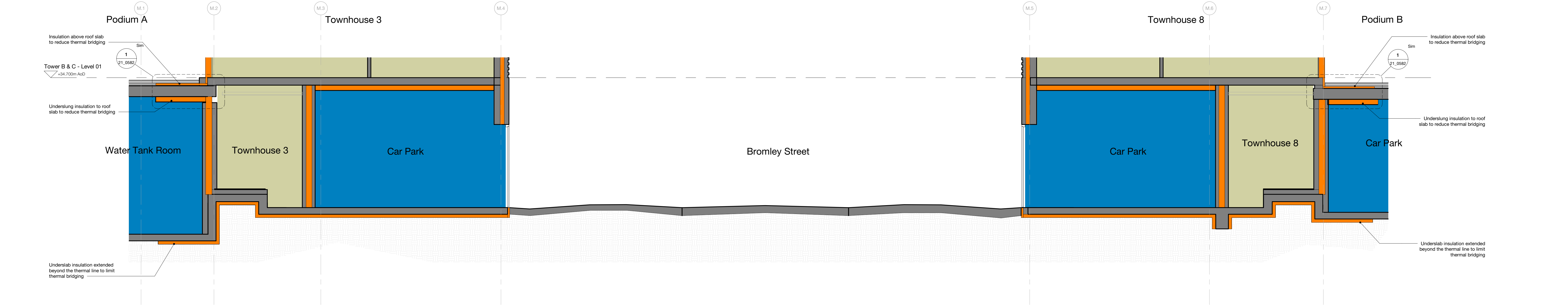
A combined system - Type A and Type B, Type A and Type C or Type B and Type C

To be read inconjunction with:-

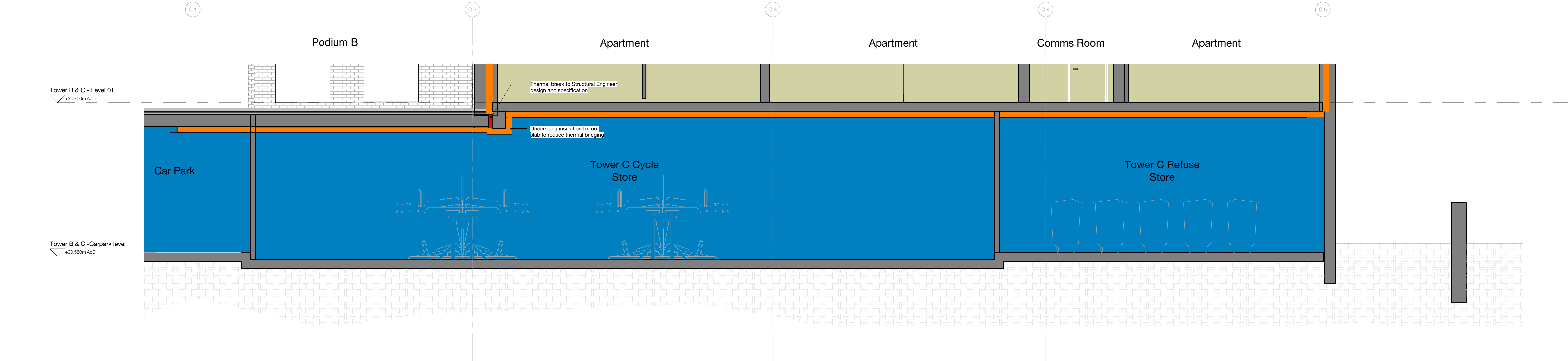
Please refer to Architectural Specification and Structural Engineer Specification for Structural Waterproofing performance requirements.

Rev	Description	Date	Scale @ A0	Date	Job Number	Project	3C Tariff Street Manchester M1 2FF
P1	Initial Issue for Stage 08	06.11.20	As indicated	Oct 2020	18059	Victoria Riverside Dantzic Street Manchester	mail@hawkinsbrown.com hawkinsbrown.com
Copyright Hawkins/Brown Architects No implied licence exists. This drawing should not be used to calculate areas for the purposes of valuation. Do not scale this drawing. All dimensions to be checked on the site by the contractor and such dimensions to be their responsibility. All work must comply with relevant British Standards and Building Regulations requirements. Drawing errors and omissions to be reported to the architect. To be read in conjunction with Architect's specification and other consultant information.			Drawn By PD	Checked By JK	Status S2	Drawing Waterproofing Scoping Sections - Sheet 1 of 2	
			Drawing No. VRS-HBA-SW-XX-DR-A-14_0301	Rev P1	Purpose of Issue Information		

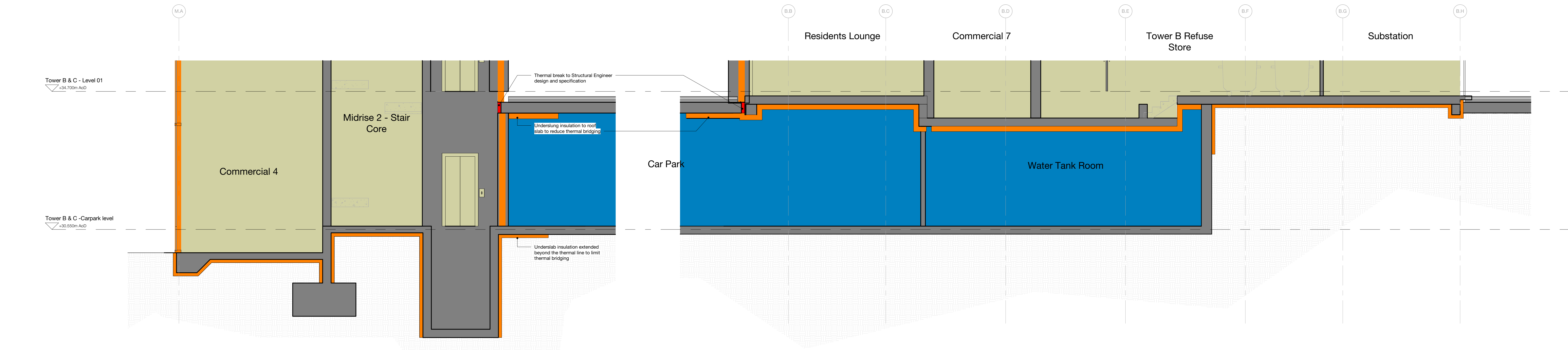
Hawkins
Brown



1 Townhouses - Short Section
1 : 50



2 Tower C / Podium - Short Section
1 : 50



3 Mid Rise M2 / Podium / Tower B - Long Section
1 : 50

Environmental Design Requirements:-

The below setout the requirements for the grade of the Basement / Internal Spaces using the classifications from *BS 8102:2009 'Code of Practice for Protection of Below Ground Structures Against Water From the Ground'*. This drawing outlines performance requirements which should be designed to by the Waterproofing Design Specialist (see Waterproofing Systems Design Responsibility below), as below:-

	GRADE 3
	GRADE 2
	GRADE 1

Extract from NHBC guidance website on the use of BS 8102 gradings for different uses within new buildings:-

Grade	Description	Generally required for:
GRADE 3	No water penetration acceptable and a dry environment provided where maintained by adequate ventilation	Habitable accommodation
GRADE 2	No water penetration is acceptable although damp areas are tolerated	Non-habitable areas, such as car parks, storage or plant rooms where the internal finishes are not readily damaged by moisture
GRADE 1	Some seepage and damp areas are tolerable, dependent on intended use	Retaining walls typically used to form external lightwells

Vertical Thermal Line

The thermal line has been indicated on the scoping drawings to demonstrate the thermal strategy for the facade design. Please refer to the 21 and 22 Series for the External Wall and Internal Wall Packages which describe the detail and specification.



Flood Defences

A strategy of permanent and temporary flood defences are proposed. Please refer to DWGs 21_0591 and 21_0597 for details.



Site Conditions:-

Site gas characteristics is CS1 with recommendation to fully tank and ventilate the proposed underground car park. Please refer to Phase 2 Site Investigation Report by LK Consult for further finding on site conditions and recommended provisions.

Waterproofing Systems Design Responsibility:-

Waterproofing systems should be designed by a waterproofing design specialist. Designers who have successfully completed the Certified Surveyor in Structural Waterproofing (CSW) qualification available from the Property Care Association (PCA) are generally acceptable to NHBC. An alternative demonstration of competence may be acceptable, subject to successful review with the NHBC.

The waterproofing design specialist should be appointed in the early design stages to co-ordinate with other designers, including the engineer, and to ensure satisfactory integration of the waterproofing system.

Design and specification information should be provided to NHBC at least eight weeks in advance of the works starting on site, in accordance with NHBC Rules.

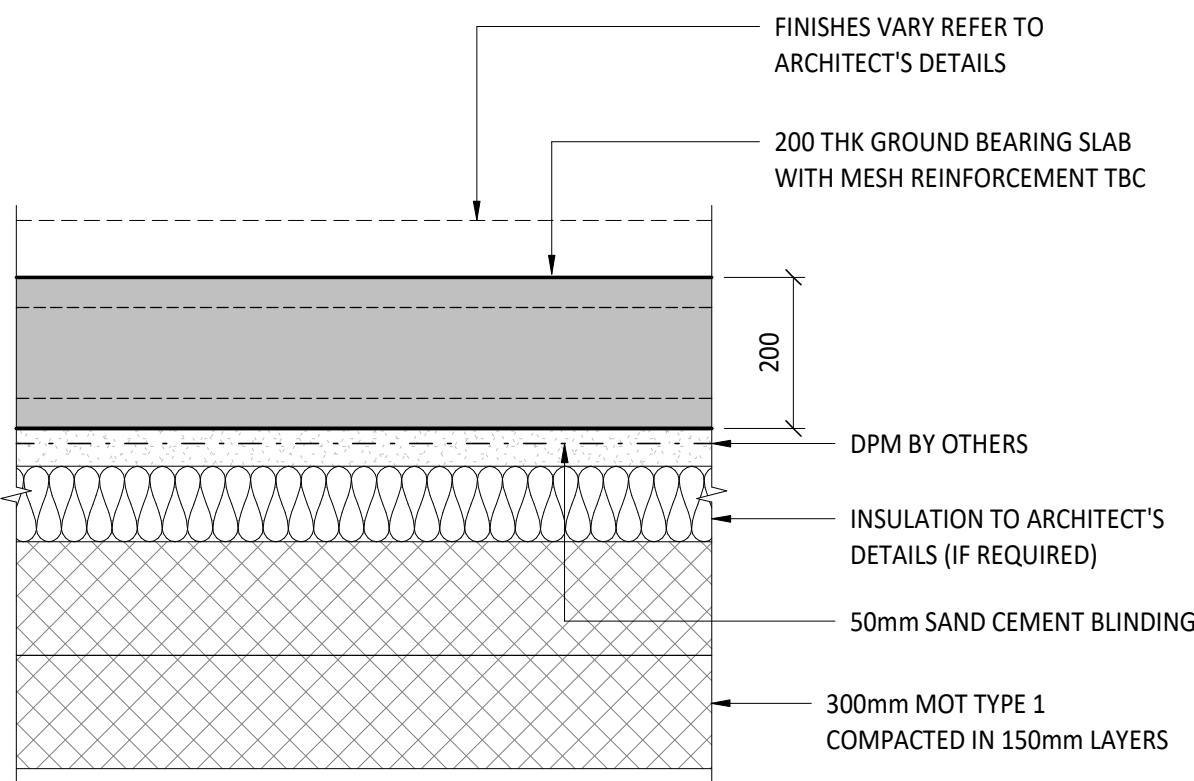
Risk-based Design Requirements:-

The below waterproofing performance requirements are in accordance with NHBC guidance note 5.4 on *Waterproofing of basements and other below ground structures*, which should be consulted for further information:-

- Combined systems should be used where:
- a **Grade 3 environment** is needed, and the wall retains more than 600mm
- The following Types of waterproofing are acceptable where a Grade 2 environment is needed and more than 600mm of ground is retained:
- Type A fully bonded barrier** - Type A barrier that forms part of a composite structural wall, including liquid applied and cementitious systems. Post-applied sheet membranes are not considered to be fully bonded barriers
 - Type B** - the water-resistant properties of the retaining structure providing waterproofing to the building. This chapter provides specific guidance for the use of Type B concrete systems cast in-situ, with or without waterproofing admixtures. The principles are applicable to other Type B systems listed in BS 8102
 - Type C** - Construction that incorporates a cavity, generally formed with a cavity drain membrane. Water is removed from the cavity via a managed drainage system
 - A combined system** - Type A and Type B, Type A and Type C or Type B and Type C

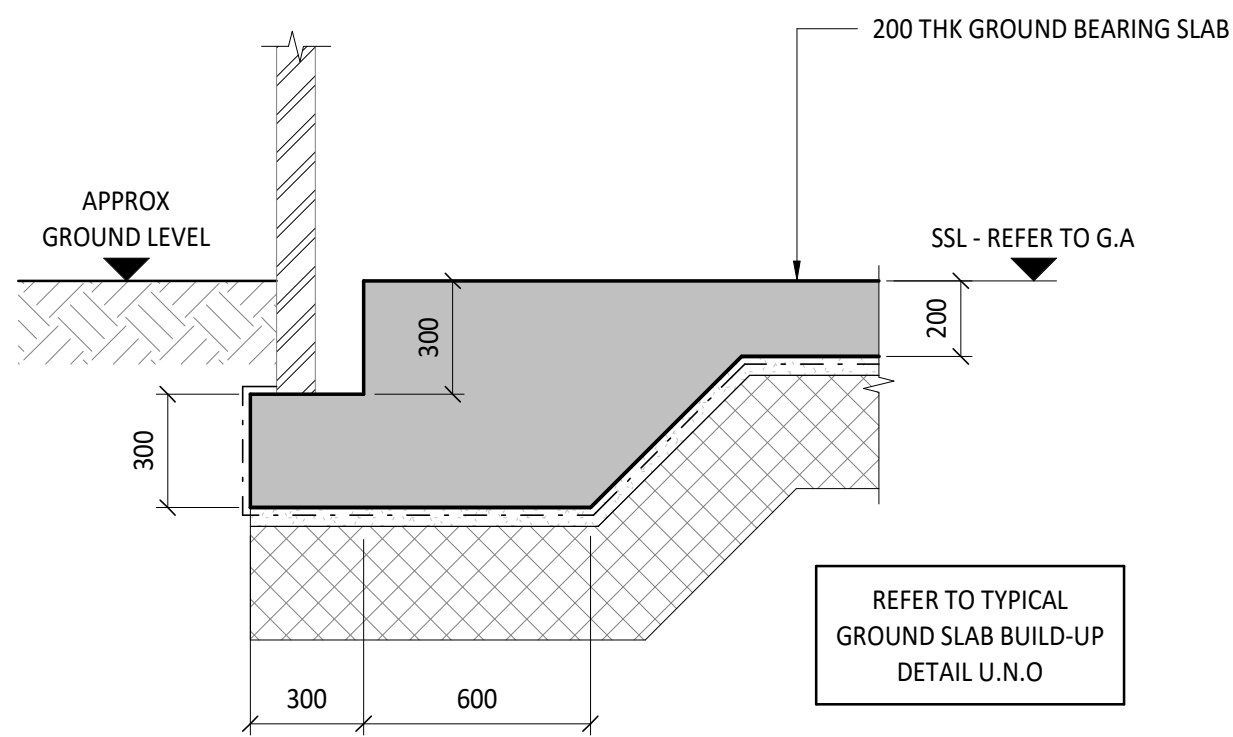
To be read in conjunction with:-

Please refer to Architectural Specification and Structural Engineer Specification for Structural Waterproofing performance requirements.



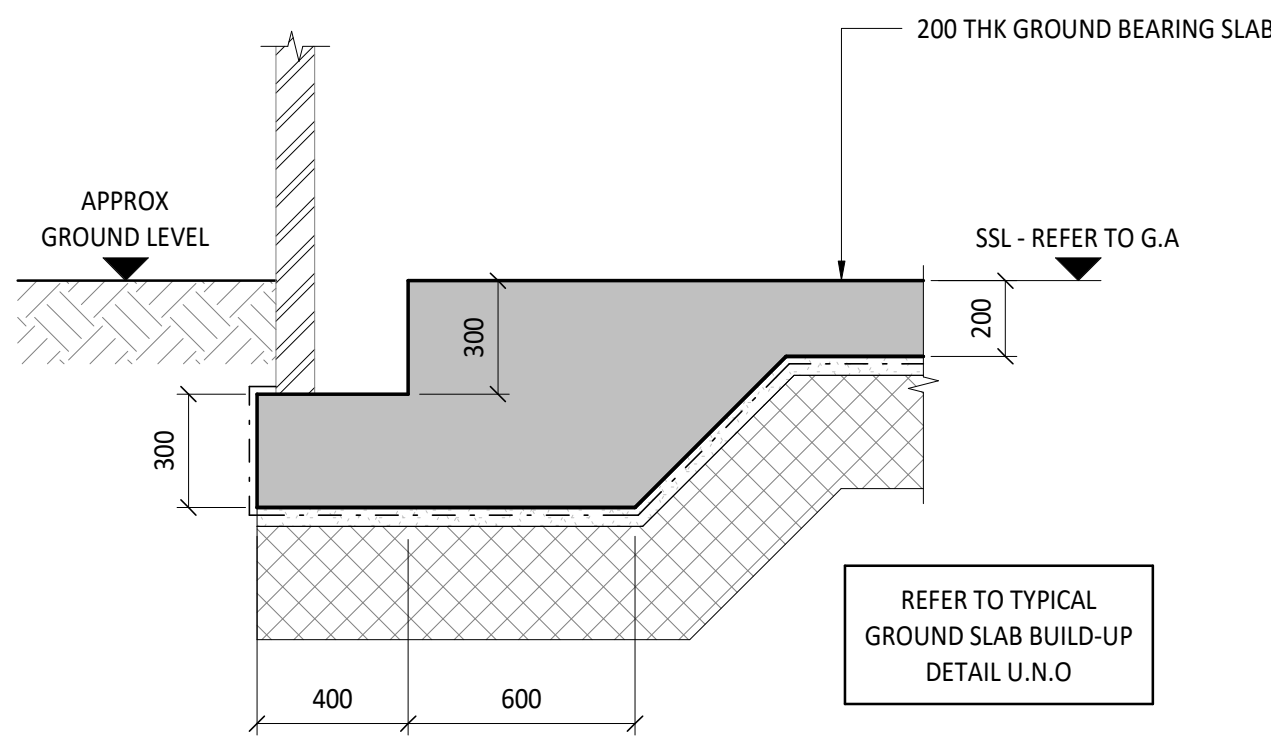
TYP1 - TYPICAL SLAB BUILD UP

SCALE: 1: 10 @ A1



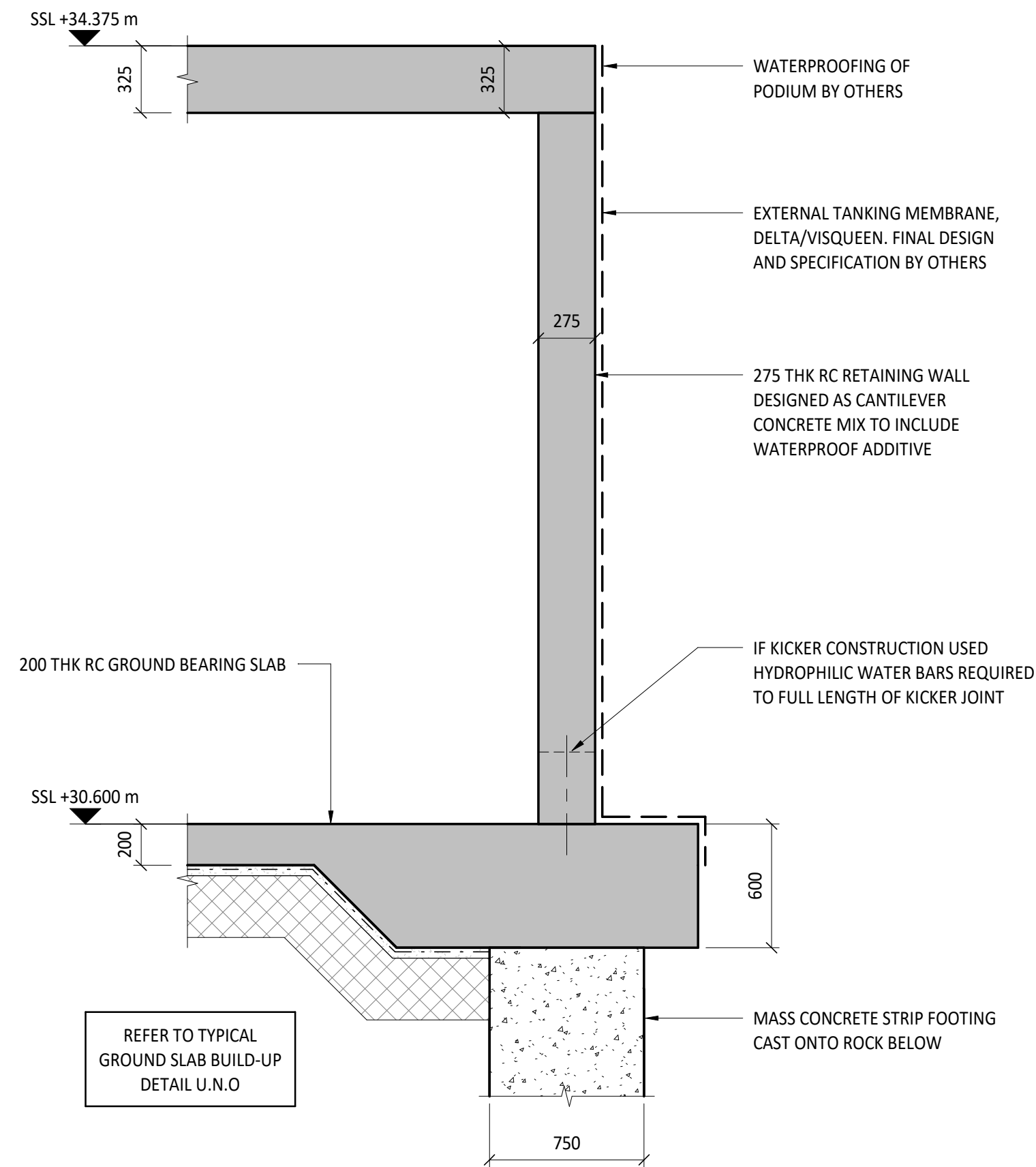
TYP2 - TYPICAL FLOOD DEFENCE UPSTAND - RC-UP-01

SCALE: 1: 20 @ A1



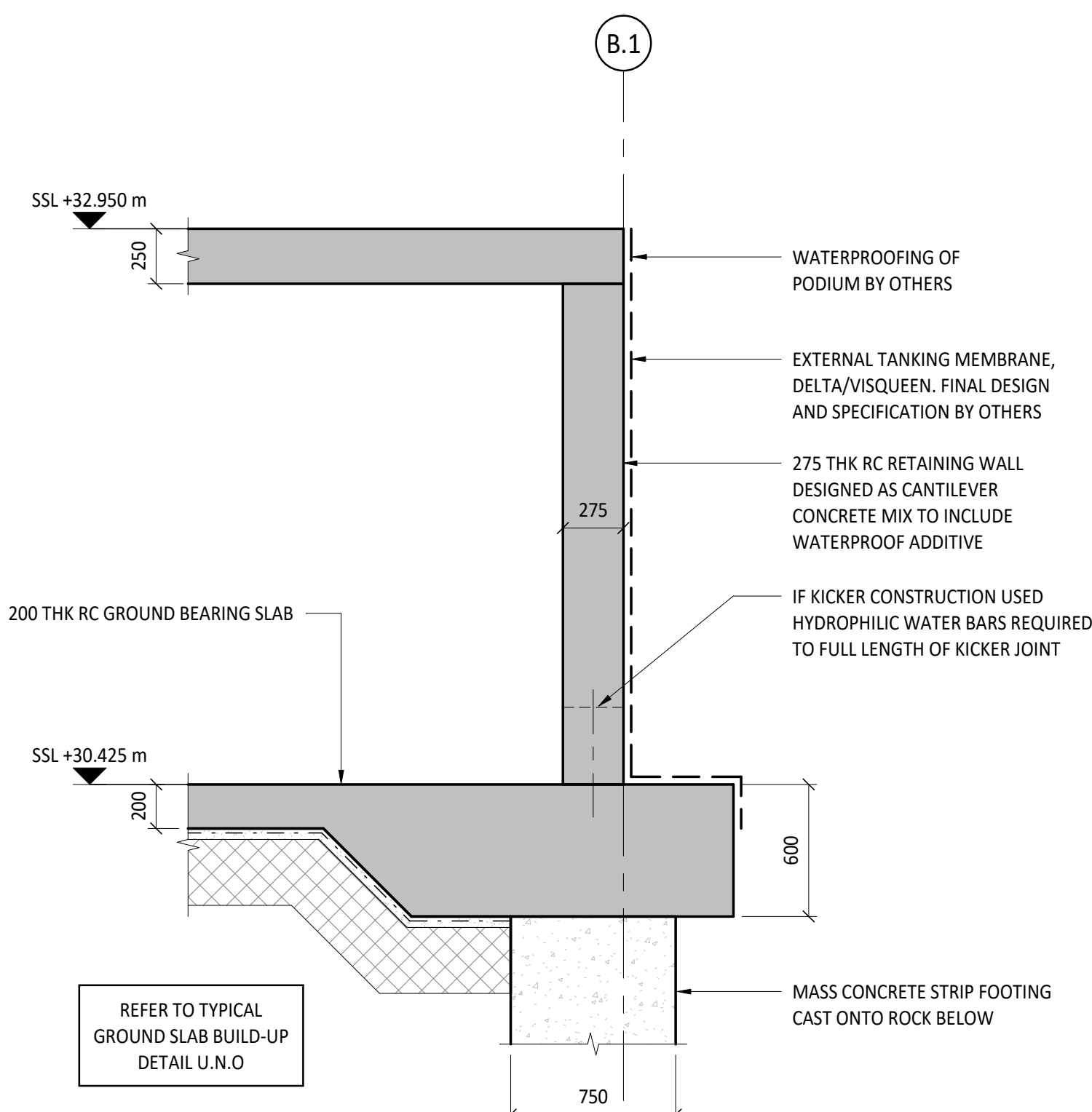
TYP4 - TYPICAL EDGE THICKENING WITH TOE

SCALE: 1: 20 @ A1



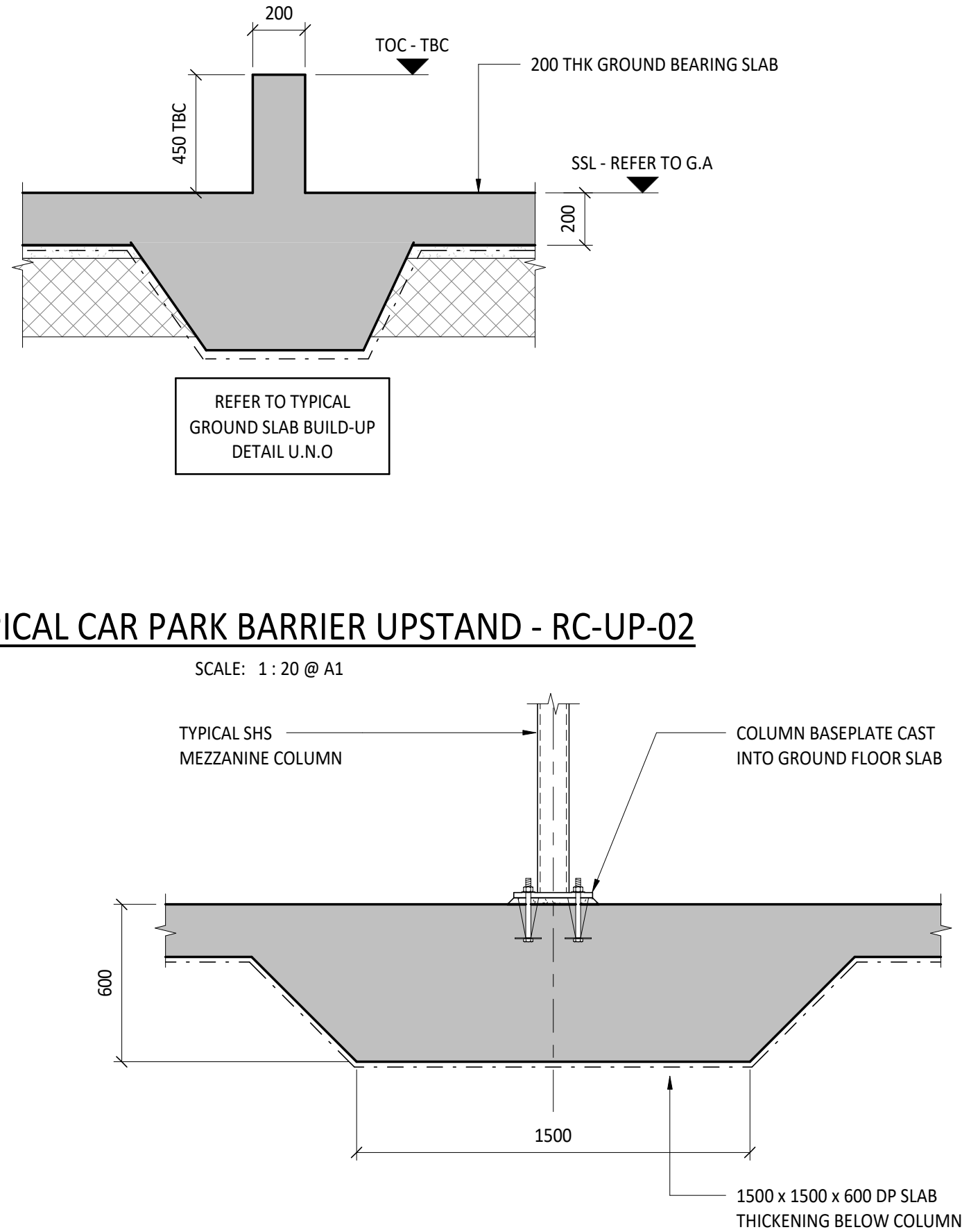
TYP5 - TYPICAL EDGE THICKENING WITH TOE (AT PIER)

SCALE: 1: 20 @ A1



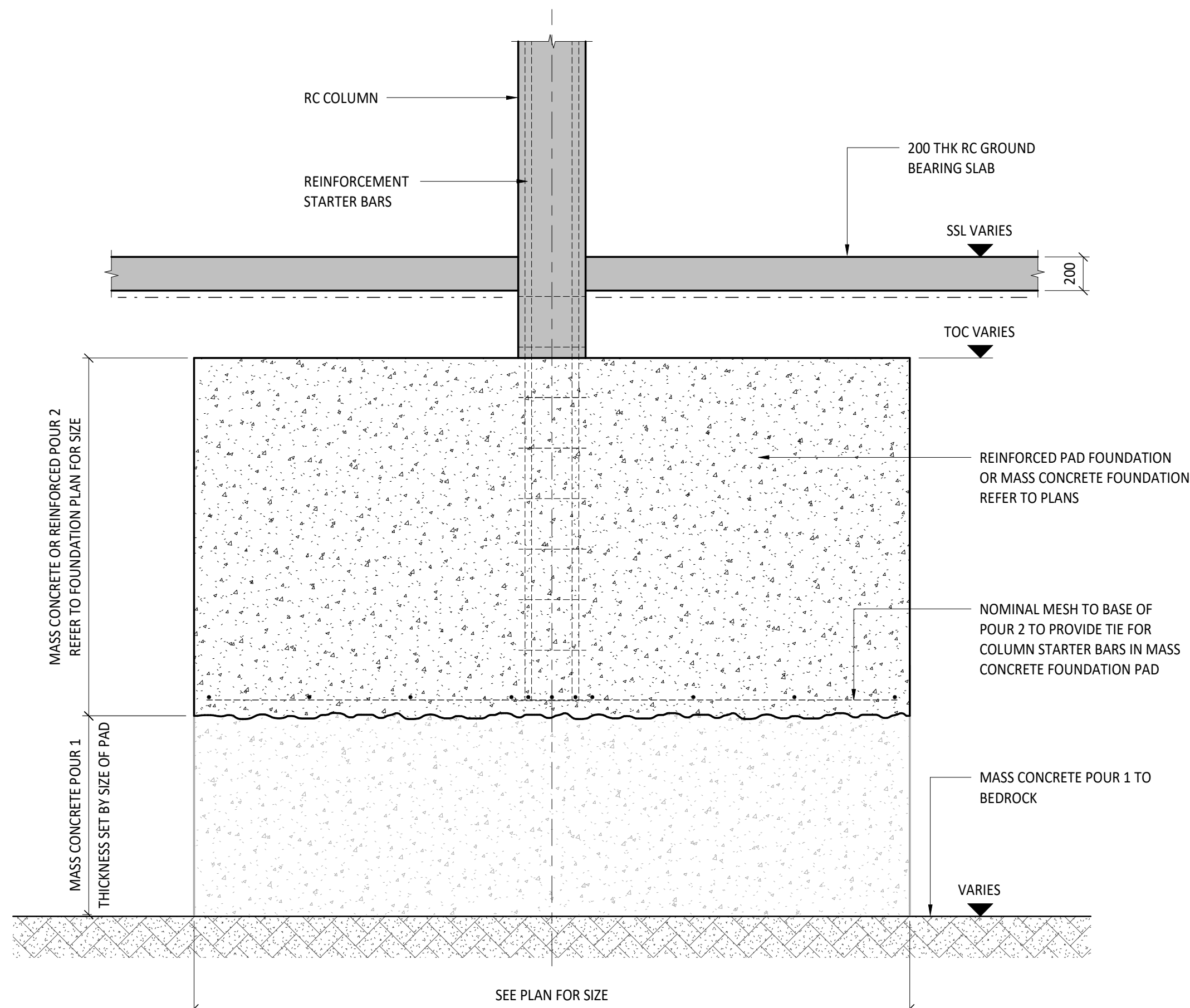
TYP6 - TYPICAL SLAB FOLD DETAIL

SCALE: 1: 20 @ A1



TYP7 - TYPICAL MEZZANINE COLUMN BASE DETAIL

SCALE: 1: 20 @ A1

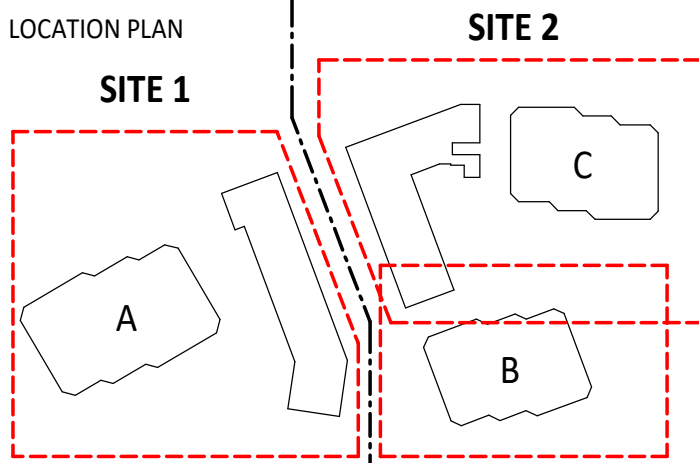


TYPICAL PAD FOUNDATION POUR SEQUENCE

SCALE: 1: 25 @ A1

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NOTES

20.11.20	P02	STAGE 3B UPDATE	MJF	DP
06.11.20	P01	STAGE 3B ISSUE	MJF	DP
Date	Rev	Description	Drawn	Chkd



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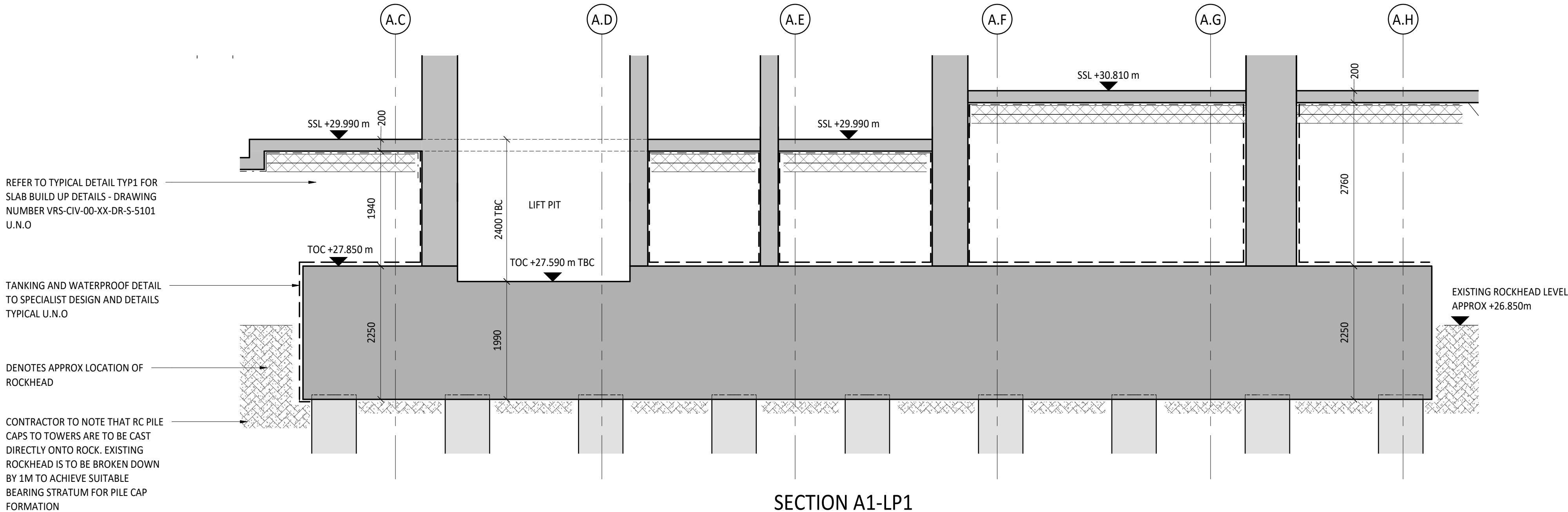
Project
VICTORIA RIVERSIDE, DANTZIC STREET
MANCHESTER

Title
SUBSTRUCTURE DETAILS - SHEET 1

Status
INFORMATION

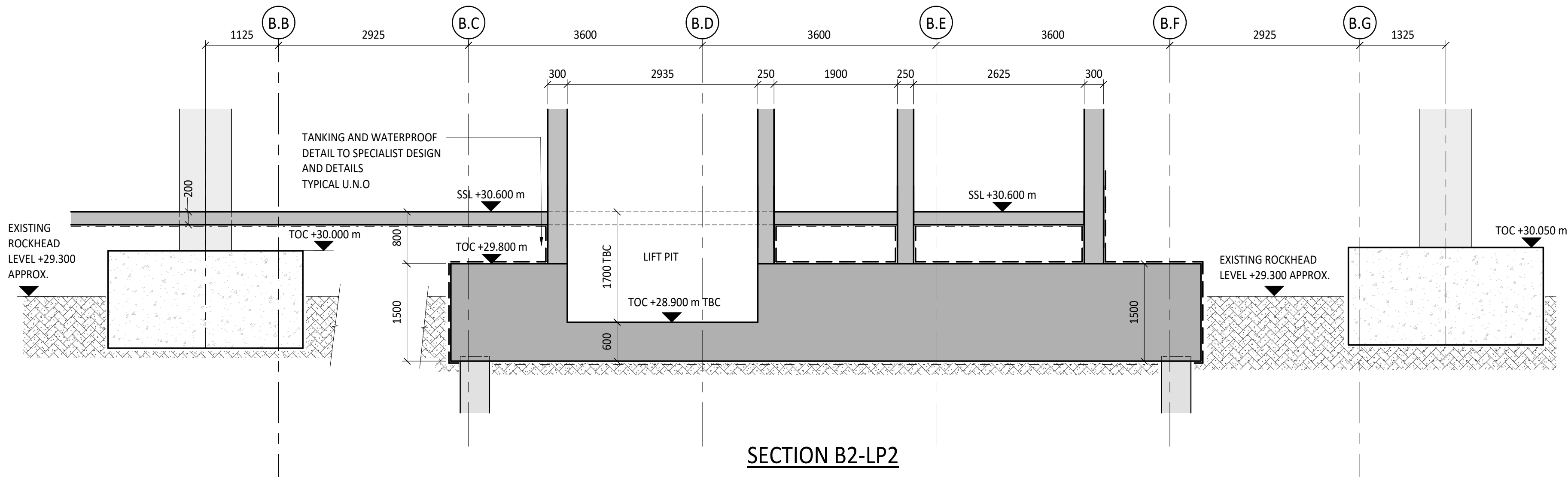
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1127-01	Varies	Nov 20	MJF	DP	S1

Drawing Number	Revision
VRS-CIV-00-XX-DR-S-5101	P02



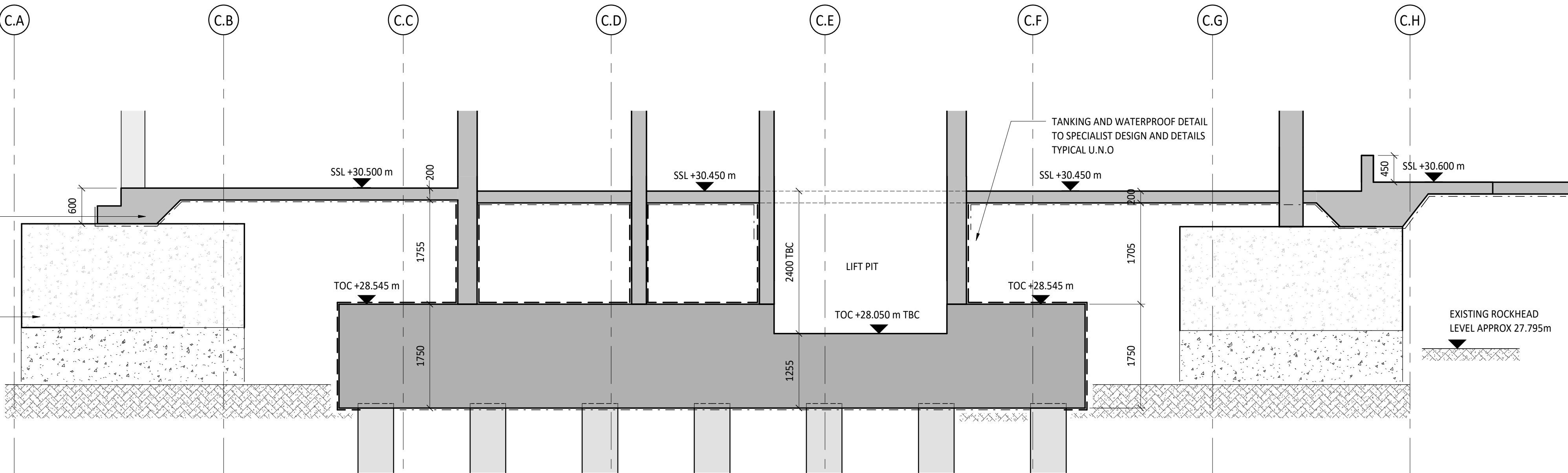
SECTION A1-LP1

SCALE: 1 : 50 @ A1



SECTION B2-LP2

SCALE: 1 : 50 @ A1

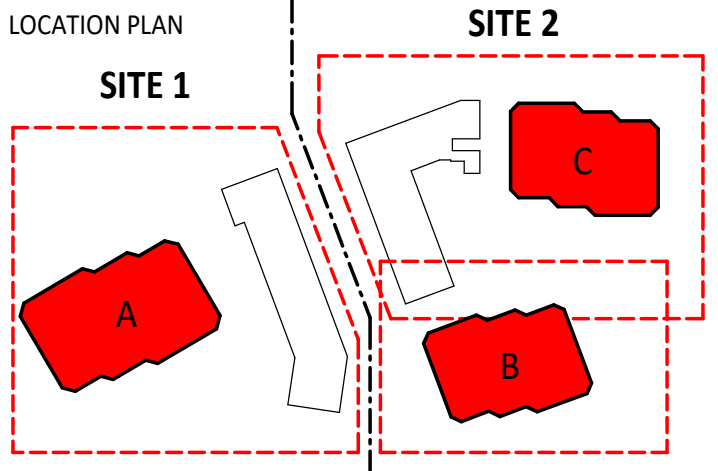


SECTION C3 - LP3

SCALE: 1 : 50 @ A1

- STANDARD NOTES
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20.11.20	P01	STAGE 3B ISSUE	MJF	DP
Date	Rev	Description	Drawn	Chkd



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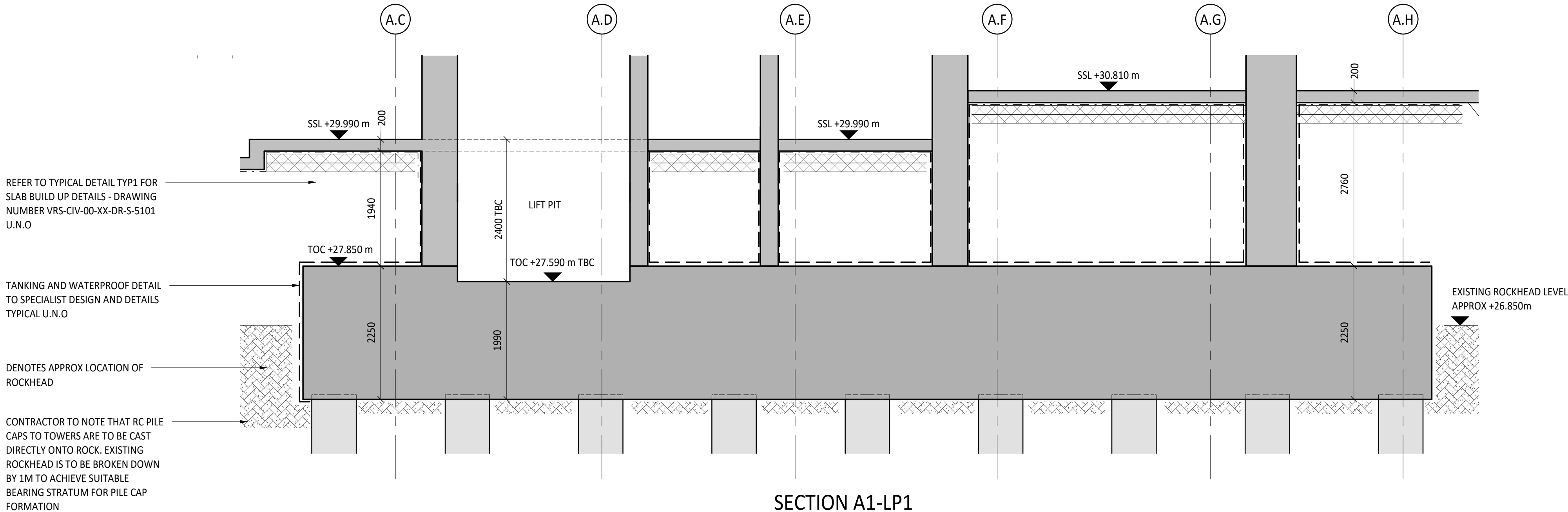
Project
VICTORIA RIVERSIDE, DANTZIC STREET
MANCHESTER

Title
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Drawing Number					Revision
VRS-CIV-00-XX-DR-S-5102					P01

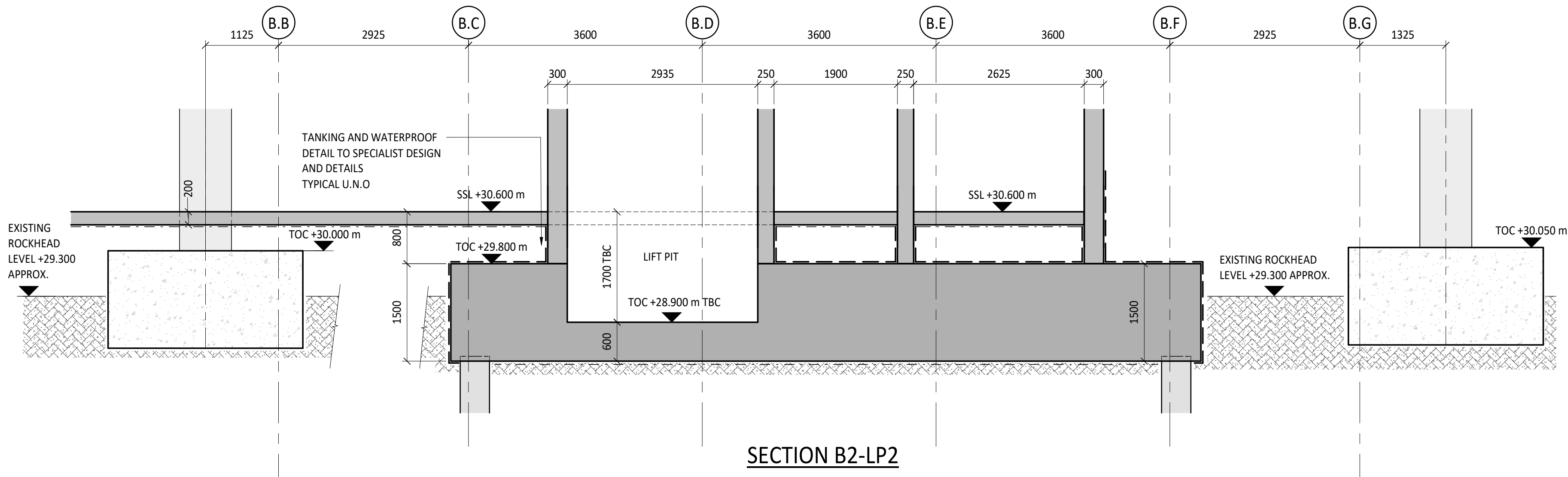
APPENDIX C

Construction Details Drawings



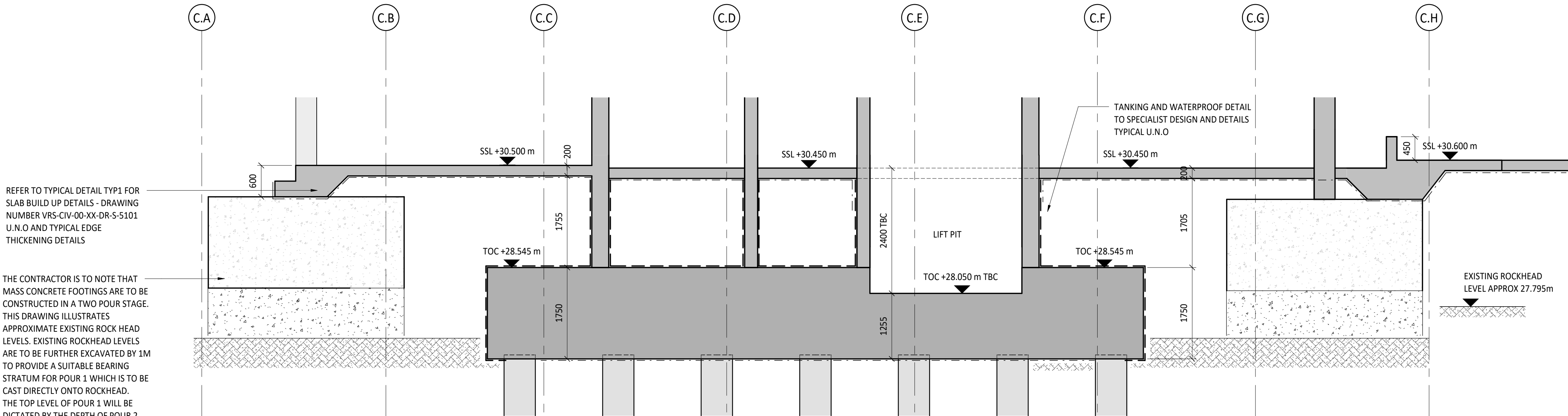
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SCALE: 1 : 50 @ A1



SECTION B2-LP2

SCALE: 1 : 50 @ A1

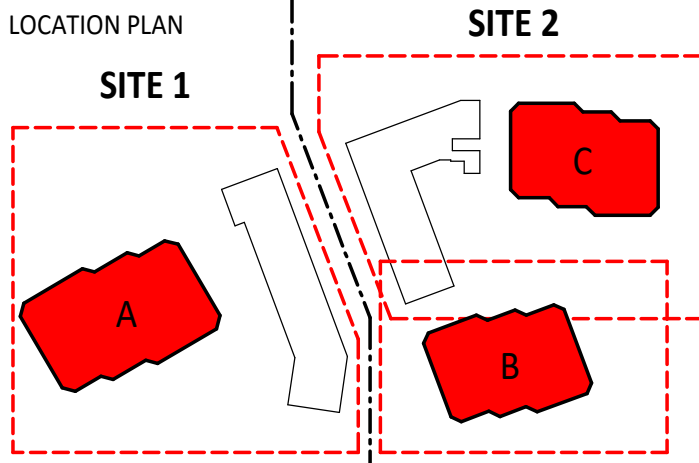


SECTION C3 - LP3

SCALE: 1 : 50 @ A1

- STANDARD NOTES
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 - 2.THIS DRAWING SHOULD NOT BE SCALED.
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20.11.20	P01	STAGE 3B ISSUE	MJF	DP
Date	Rev	Description	Drawn	Chkd



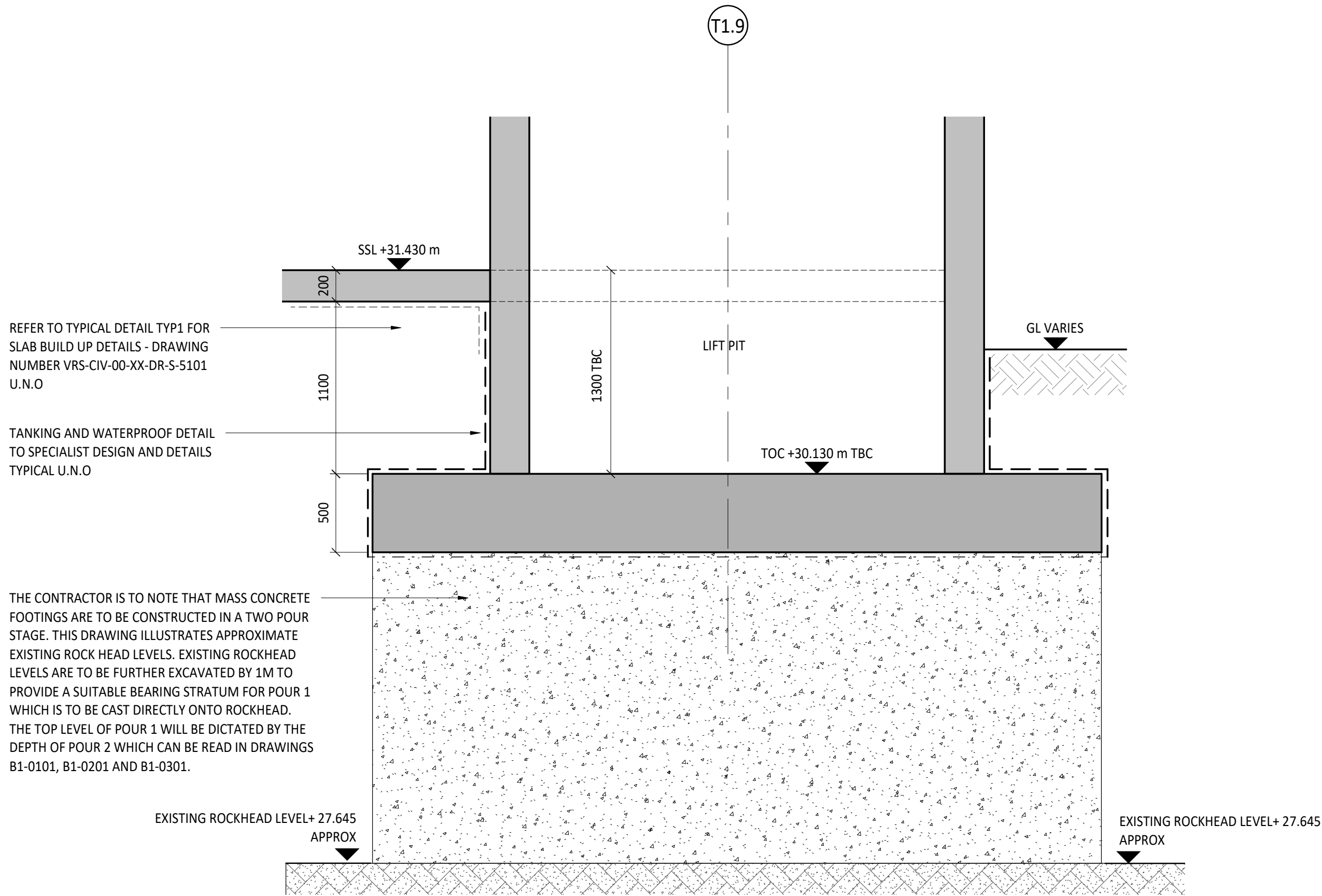
MANCHESTER Carver's Warehouse, 77 Dale St, Manchester, M1 2HG. Tel: 0161 228 6757
LONDON Reeds Wharf, 33 Mill Street, London SE1 2AX. Tel: 020 7253 2977
LEEDS Tower Works, Unit 02-01, Globe Rd, Leeds, LS11 5QG. Tel: 0113 2025 130
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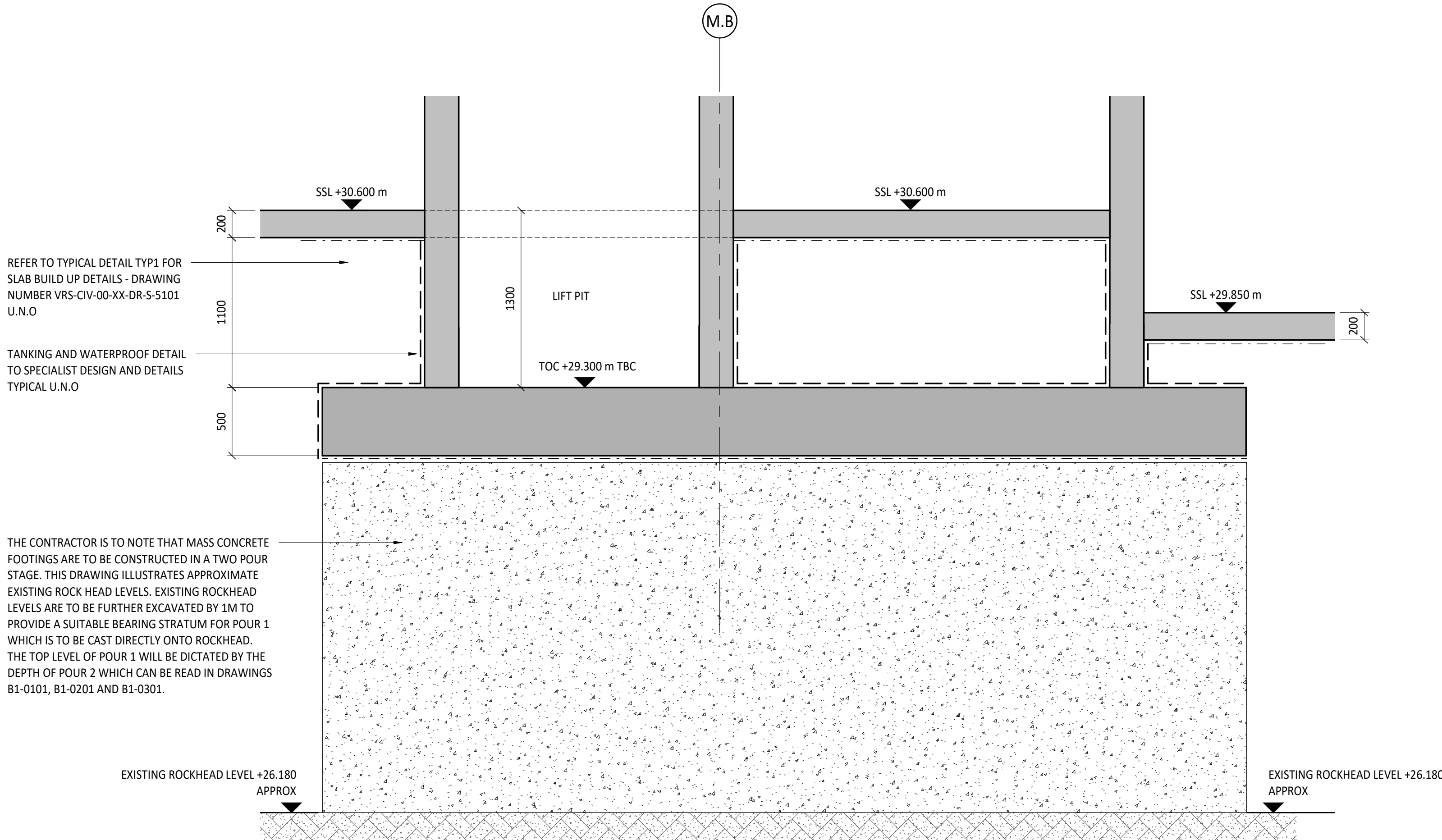
Title
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INFORMATION					
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Drawing Number					Revision
VRS-CIV-00-XX-DR-S-5102					P01



SECTION TH1 - LP4

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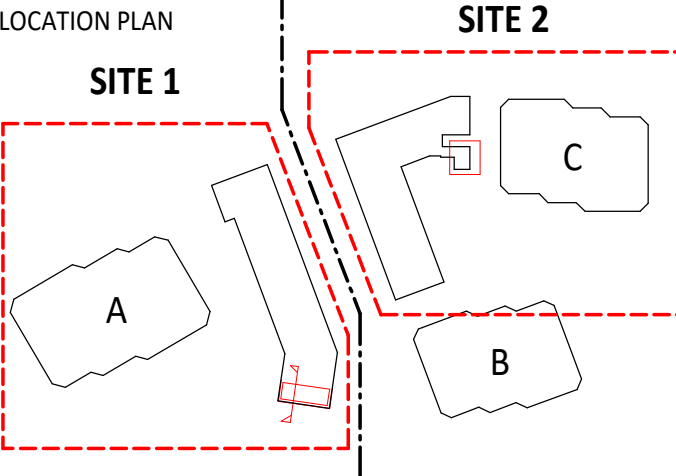


SECTION TH2 -LP5

SCALE: 1 : 25 @ A1

- STANDARD NOTES
- 1.THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS AND THE SPECIFICATIONS.
 - 2.THIS DRAWING SHOULD NOT BE SCALED.
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NOTES

CONTRACTOR TO NOTES THAT EXISTING ROCKHEAD IS TO BE REDUCED BY 1m TO REPLACE SUFFICIENT BEARING STRATA FOR FOUNDATIONS IN ACCORDANCE WITH CCG GROUND INVESTIGATION REPORT REF CCG-C-14-7780 MARCH 2015

20.11.20	P01	STAGE 3B ISSUE	MJF	DP
Date	Rev	Description	Drawn	Chkd



MANCHESTER Carver's Warehouse, 77 Dale St, Manchester, M1 2HG. Tel: 0161 228 6757
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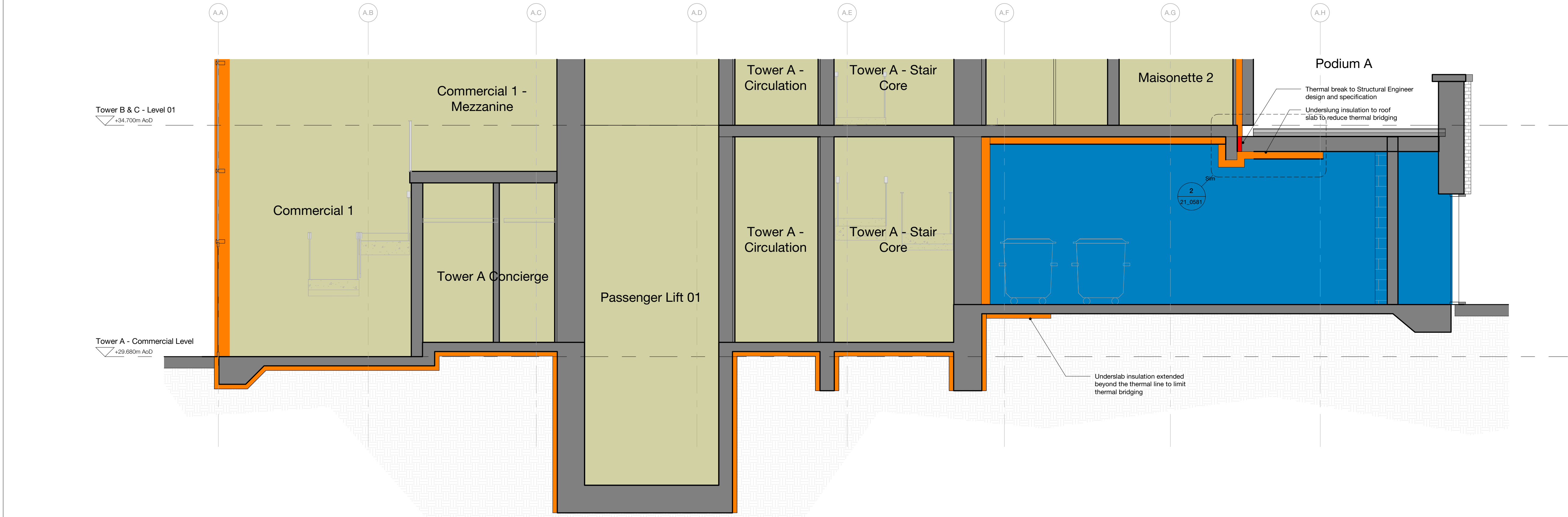
Project

VICTORIA RIVERSIDE, DANTZIC STREET
MANCHESTER

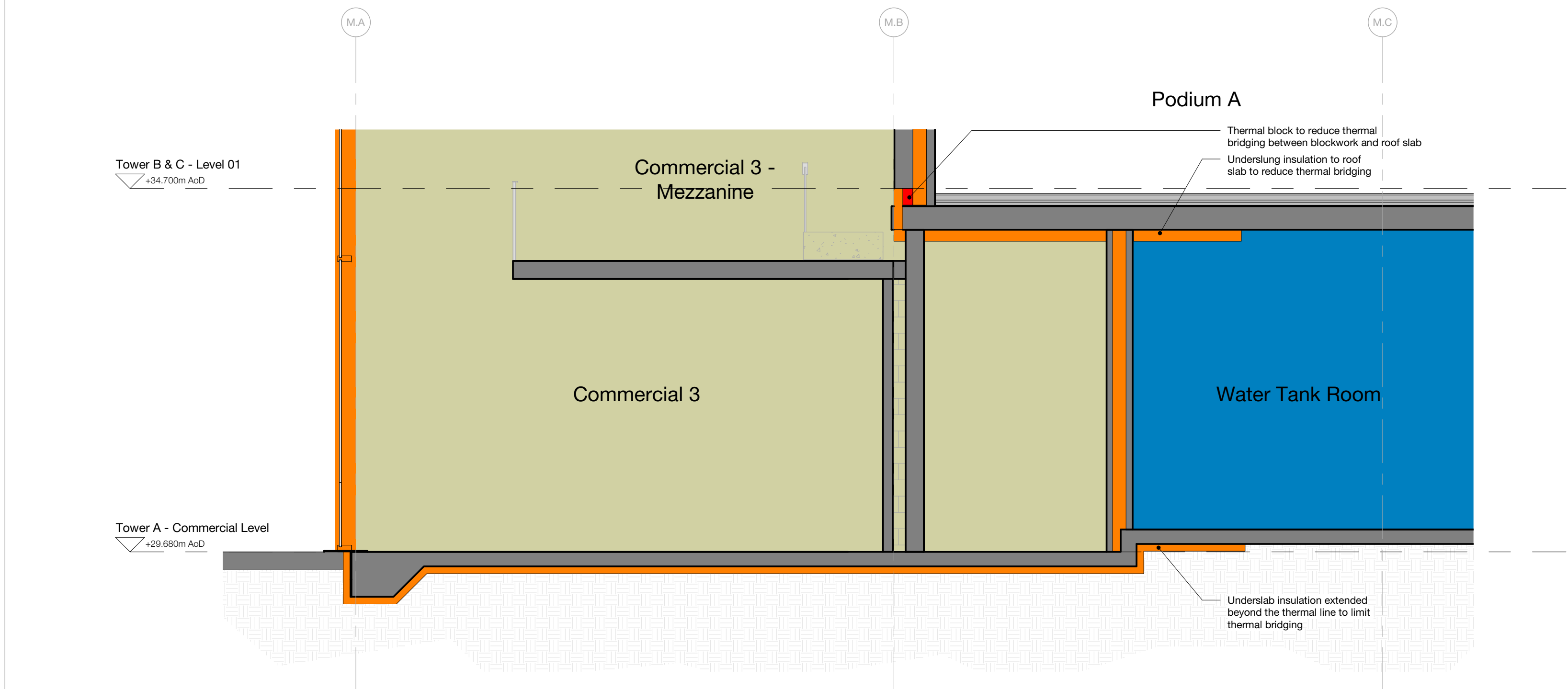
Title

SUBSTRUCTURE DETAILS SHEET 3

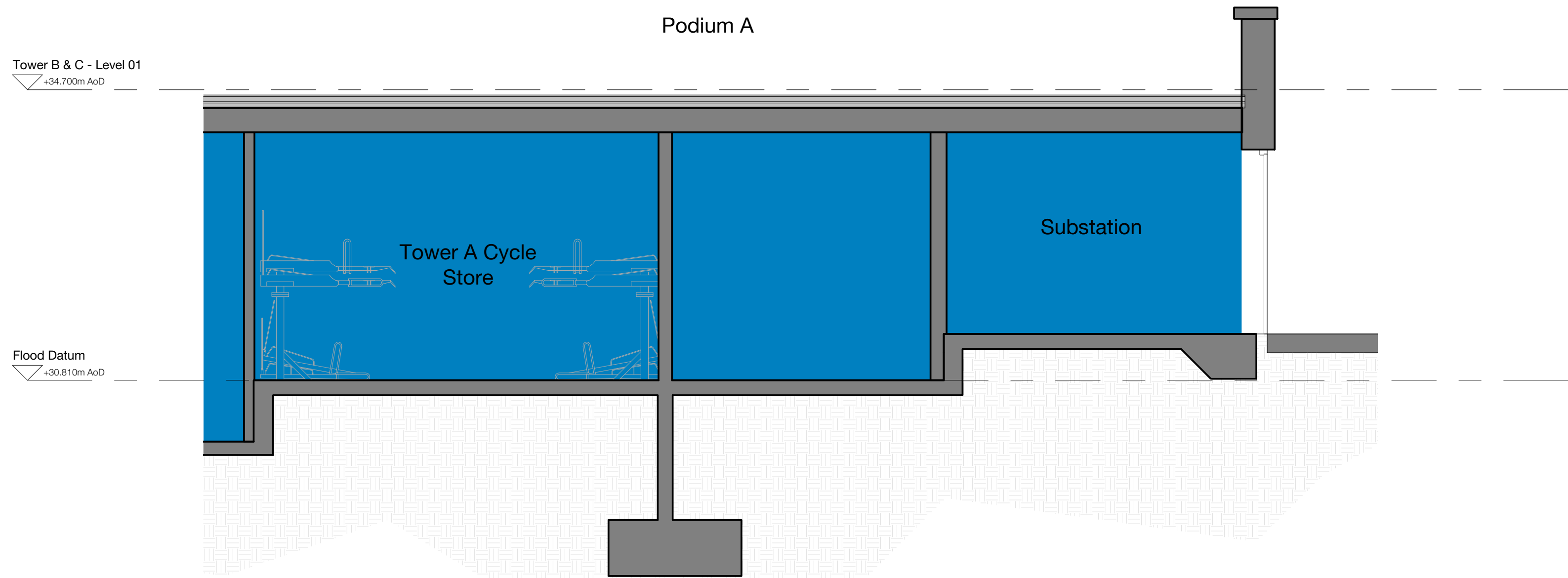
INFORMATION					
Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1127-01	1:25	Oct 20	MJF	DP	S1
Drawing Number				Revision	
VRS-CIV-00-XX-DR-S-5103				P01	



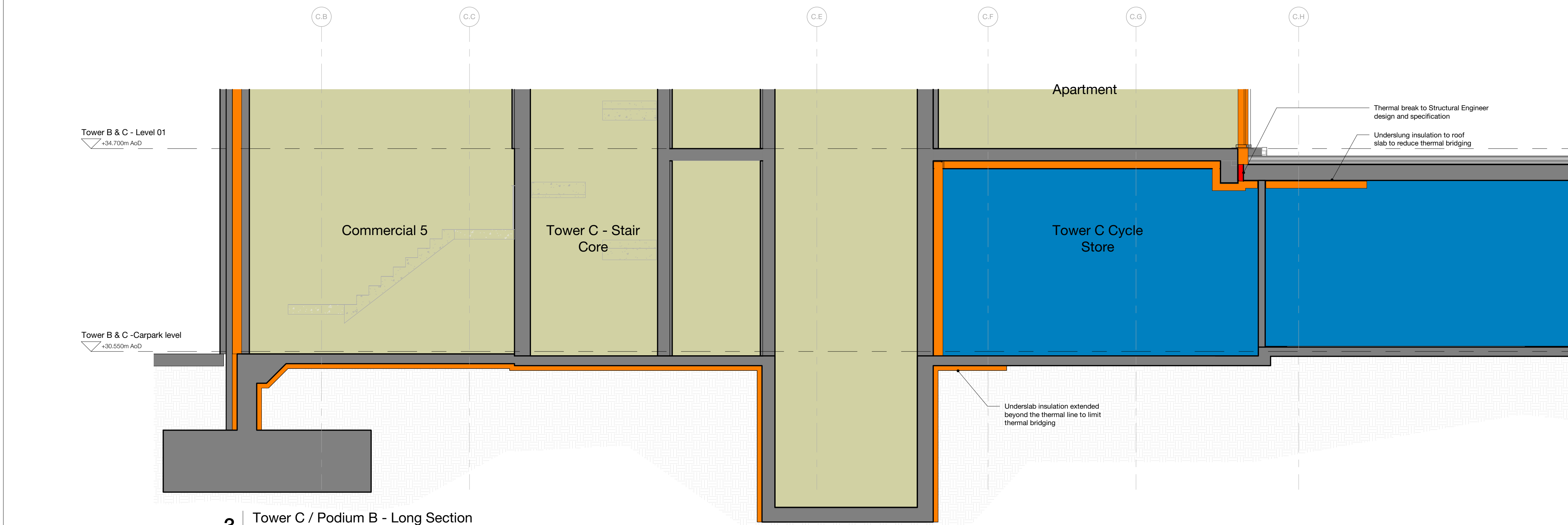
1 Tower A - Short Section
1 : 50



2 Midrise Block M1 - Short Section
1 : 50



4 Podium A - Short Section
1 : 50



3 Tower C / Podium B - Long Section
1 : 50

Environmental Design Requirements:-

The below setout the requirements for the grade of the Basement / Internal Spaces using the classifications from *BS 8102:2009 'Code of Practice for Protection of Below Ground Structures Against Water From the Ground'*. This drawing outlines the performance requirements which should be designed to by the Waterproofing Design Specialist (see Waterproofing Systems Design Responsibility below), as below:-

	GRADE 3
	GRADE 2
	GRADE 1

Extract from NHBC guidance website on the use of BS 8102 gradings for different uses within new buildings:-

Grade	Description	Generally required for:
GRADE 3	No water penetration acceptable and a dry environment provided where maintained by adequate ventilation	Habitable accommodation
GRADE 2	No water penetration is acceptable although damp areas are tolerated	Non-habitable areas, such as car parks, storage or plant rooms where the internal finishes are not readily damaged by moisture
GRADE 1	Some seepage and damp areas are tolerable, dependent on intended use	Retaining walls typically used to form external lightwells

Vertical Thermal Line

The thermal line has been indicated on the scoping drawings to demonstrate the thermal strategy for the facade design. Please refer to the 21 and 22 Series for the External Wall and Internal Wall Packages which describe the detail and specification.

	Thermal Line
	Underslab insulation extended beyond thermal line

Flood Defences

A strategy of permanent and temporary flood defences are proposed. Please refer to DWGs Z1_0591 and Z1_0597 for details.

	Internal concrete upstand
	Demountable barrier

Site Conditions:-

Site gas characteristics is CS1 with recommendation to fully tank and ventilate the proposed underground car park. Please refer to Phase 2 Site Investigation Report by LK Consult for further finding on site conditions and recommended provisions.

Waterproofing Systems Design Responsibility:-

Waterproofing systems should be designed by a waterproofing design specialist. Designers who have successfully completed the Certified Surveyor in Structural Waterproofing (CSSW) qualification available from the Property Care Association (PCA) are generally acceptable to NHBC. An alternative demonstration of competence may be acceptable, subject to successful review with the NHBC.

The waterproofing design specialist should be appointed in the early design stages to co-ordinate with other designers, including the engineer, and to ensure satisfactory integration of the waterproofing system.

Design and specification information should be provided to NHBC at least eight weeks in advance of the works starting on site, in accordance with NHBC Rules.

Risk-based Design Requirements:-

The below waterproofing performance requirements are in accordance with NHBC guidance note 5.4 on *Waterproofing of basements and other below ground structures*, which should be consulted for further information:-

Combined systems should be used where:

a Grade 3 environment is needed, and the wall retains more than 600mm

The following Types of waterproofing are acceptable where a Grade 2 environment is needed and more than 600mm of ground is retained:

Type A fully bonded barrier - Type A barrier that forms part of a composite structural wall, including liquid applied and cementitious systems. Post-applied sheet membranes are not considered to be fully bonded barriers

Type B - the water-resistant properties of the retaining structure providing waterproofing to the building. This chapter provides specific guidance for the use of Type B concrete systems cast in-situ, with or without waterproofing admixtures. The principles are applicable to other Type B systems listed in BS 8102

Type C - Construction that incorporates a cavity, generally formed with a cavity drain membrane. Water is removed from the cavity via a managed drainage system

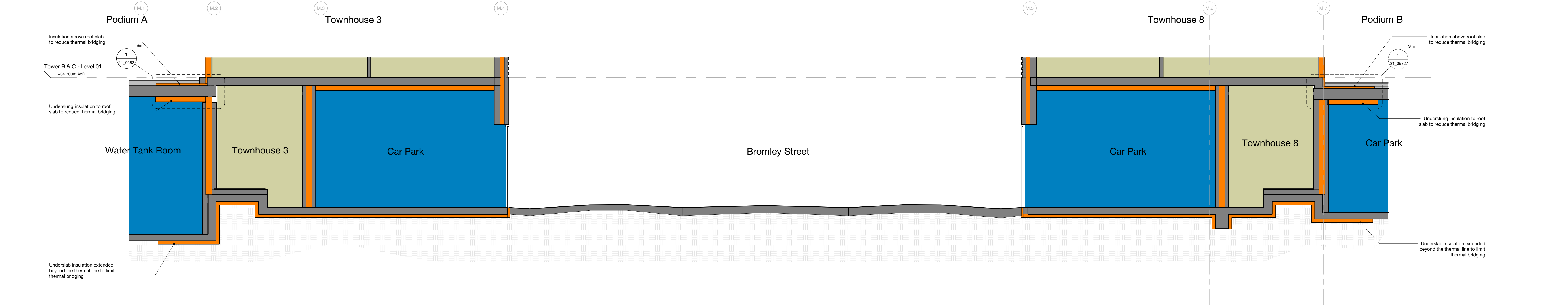
A combined system - Type A and Type B, Type A and Type C or Type B and Type C

To be read inconjunction with:-

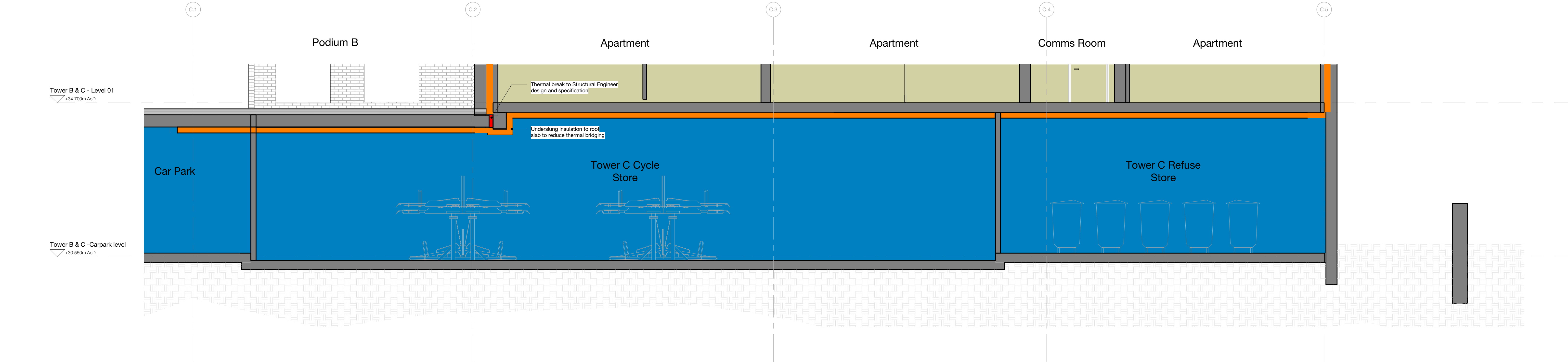
Please refer to Architectural Specification and Structural Engineer Specification for Structural Waterproofing performance requirements.

Rev	Description	Date	Scale @ A0	Date	Job Number	Project	3C Tariff Street Manchester M1 2FF
P1	Initial Issue for Stage 08	06.11.20	As indicated	Oct 2020	18059	Victoria Riverside Dantzic Street Manchester	mail@hawkinsbrown.com hawkinsbrown.com
Copyright Hawkins/Brown Architects No implied licence exists. This drawing should not be used to calculate areas for the purposes of valuation. Do not scale this drawing. All dimensions to be checked on the site by the contractor and such dimensions to be their responsibility. All work must comply with relevant British Standards and Building Regulations requirements. Drawing errors and omissions to be reported to the architect. To be read in conjunction with Architect's specification and other consultant information.			Drawn By PD	Checked By JK	Status S2	Drawing Waterproofing Scoping Sections - Sheet 1 of 2	
			Drawing No. VRS-HBA-SW-XX-DR-A-14_0301	Rev P1	Purpose of Issue Information		

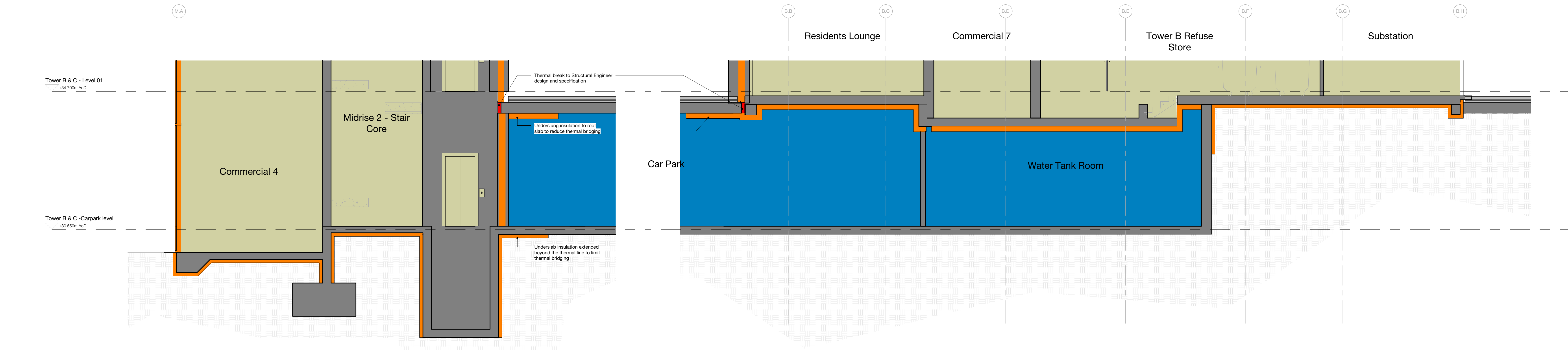
Hawkins
Brown



1 Townhouses - Short Section
1 : 50



2 Tower C / Podium - Short Section
1 : 50



3 Mid Rise M2 / Podium / Tower B - Long Section
1 : 50

Environmental Design Requirements:-

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Flood Defences

A strategy of permanent and temporary flood defences are proposed. Please refer to DWGs 21_0591 and 21_0597 for details.



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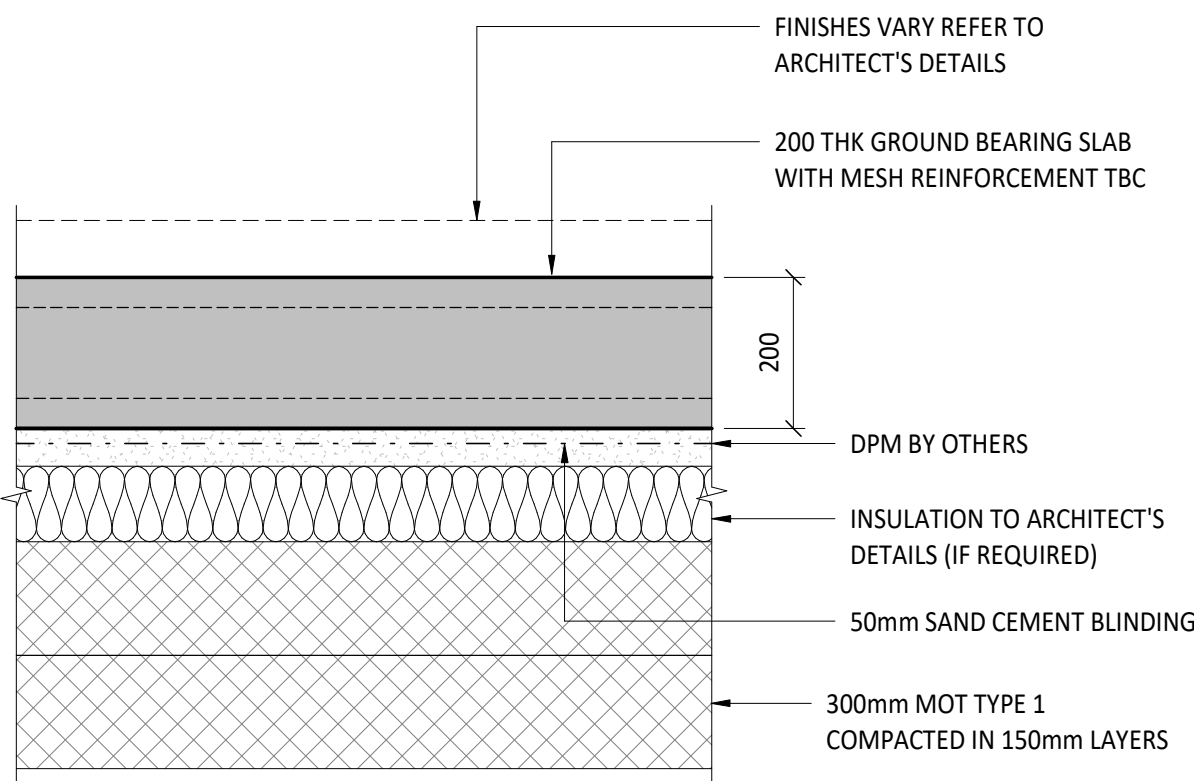
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A combined system - Type A and Type B, Type A and Type C or Type B and Type C

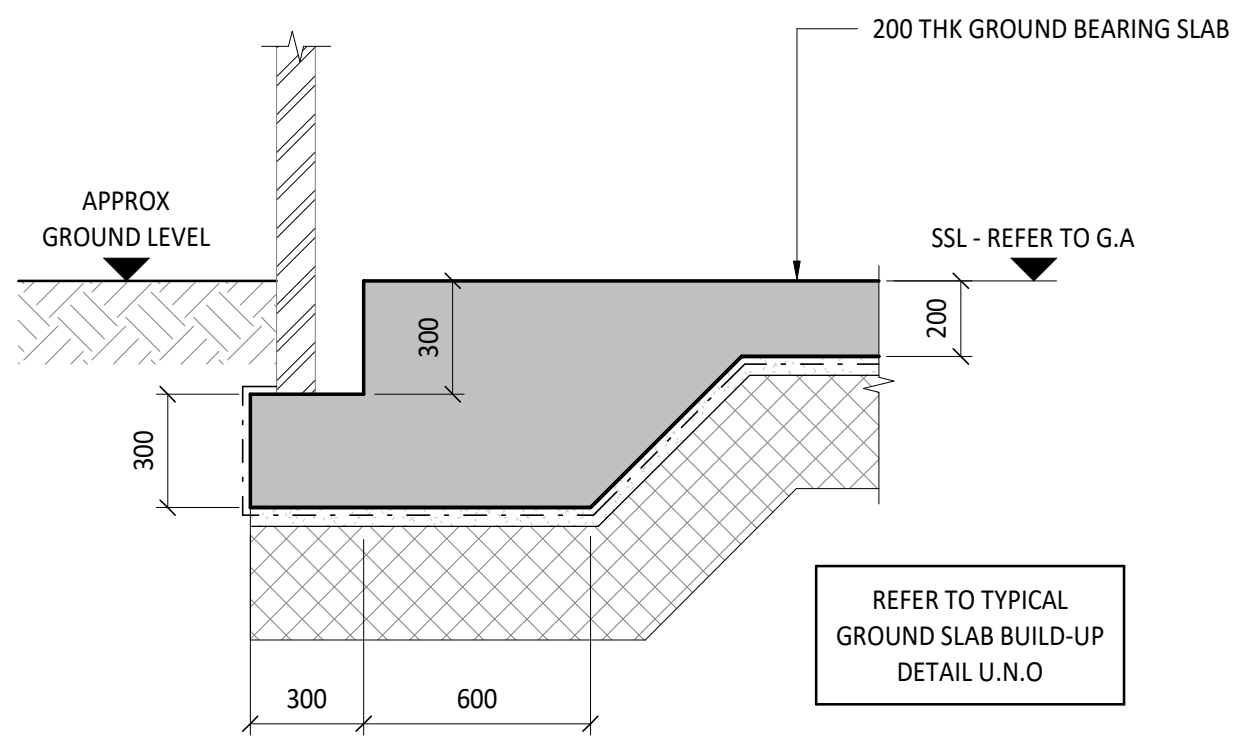
To be read in conjunction with:-

Please refer to Architectural Specification and Structural Engineer Specification for Structural Waterproofing performance requirements.



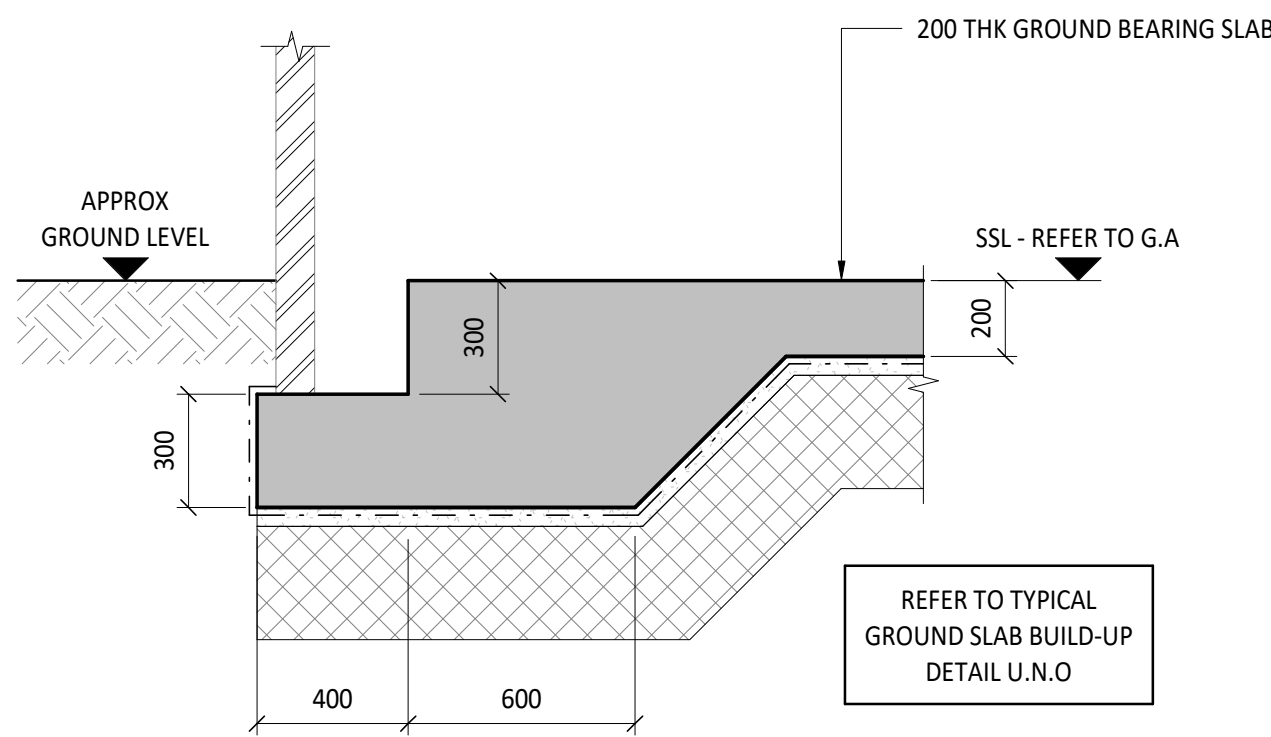
TYP1 - TYPICAL SLAB BUILD UP

SCALE: 1: 10 @ A1



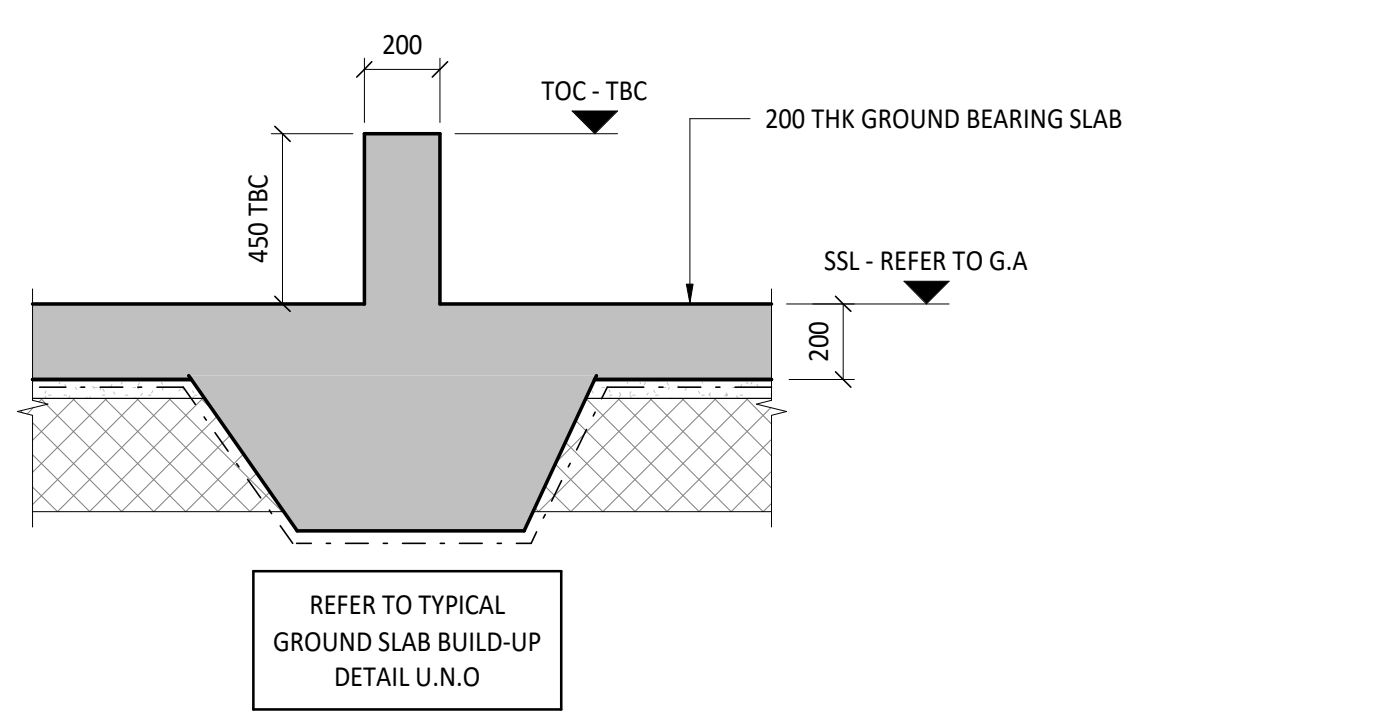
TYP2 - TYPICAL FLOOD DEFENCE UPSTAND - RC-UP-01

SCALE: 1: 20 @ A1



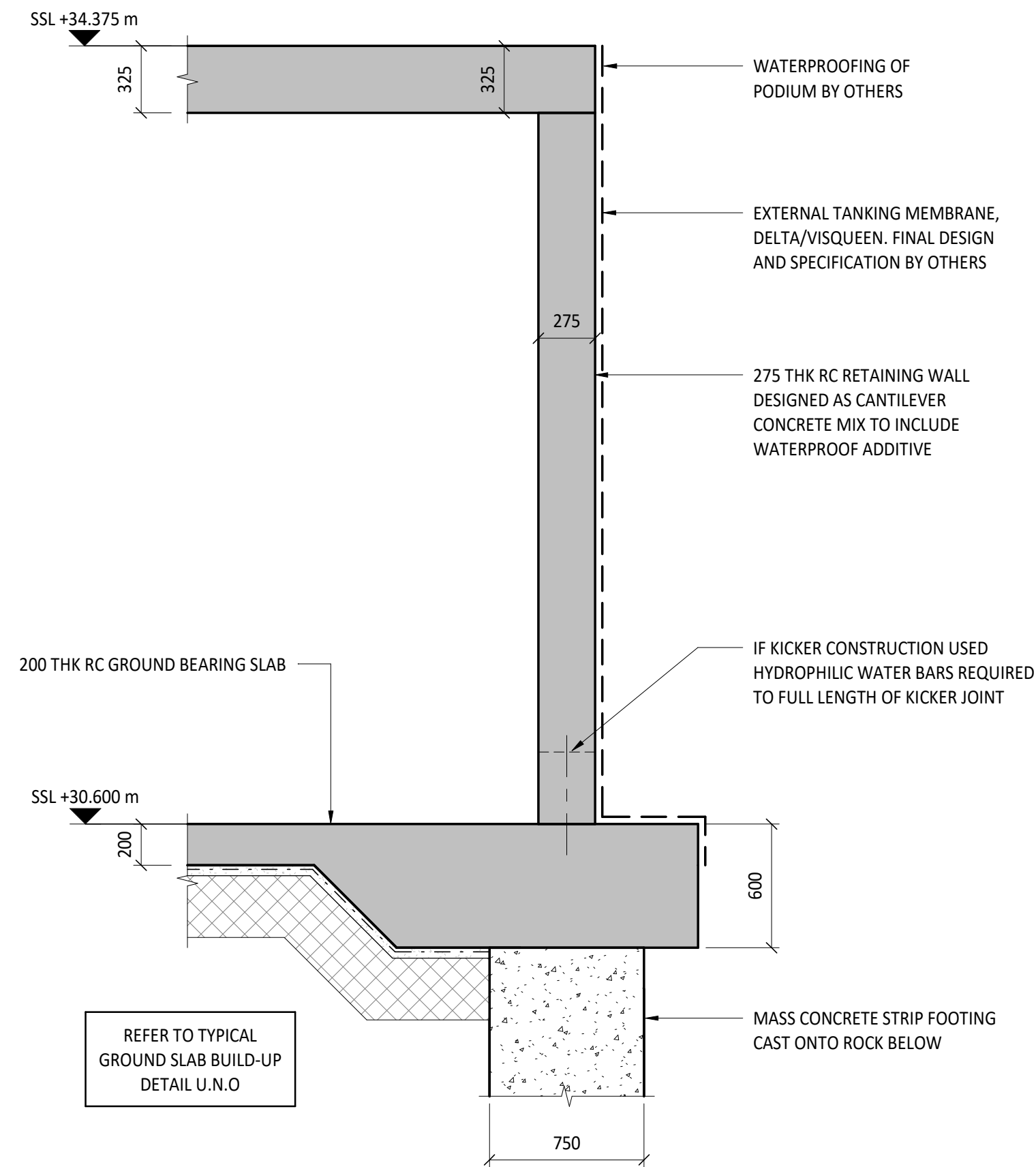
TYP3 - TYPICAL CAR PARK BARRIER UPSTAND - RC-UP-02

SCALE: 1: 20 @ A1



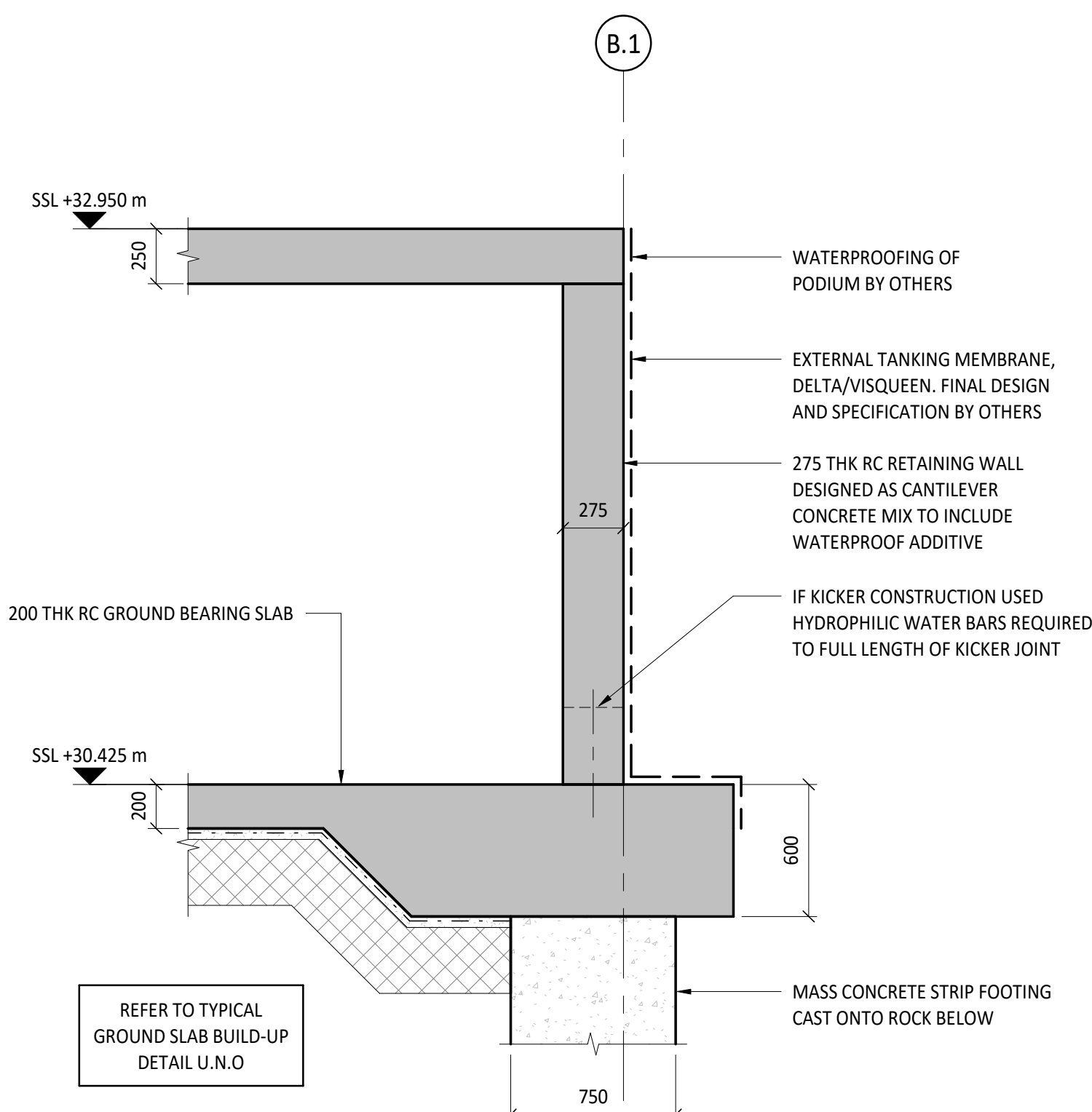
TYP4 - TYPICAL EDGE THICKENING WITH TOE

SCALE: 1: 20 @ A1



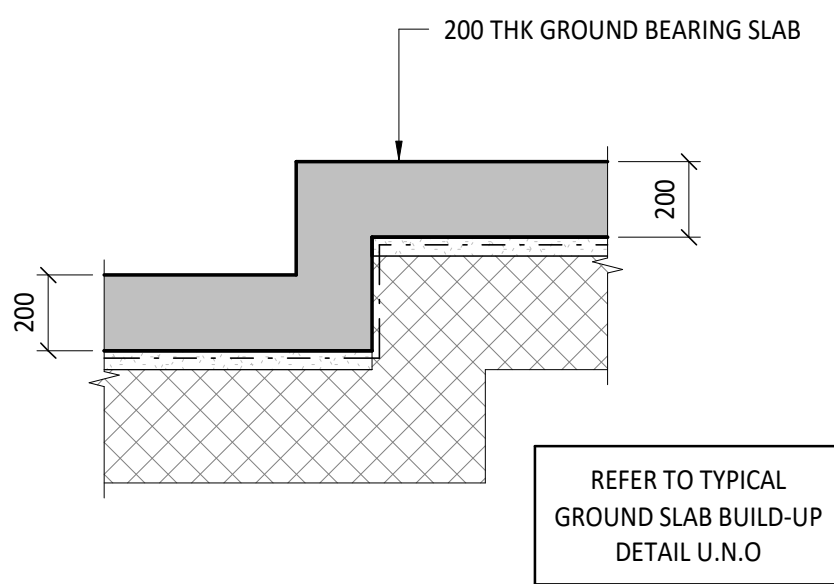
TYP5 - TYPICAL EDGE THICKENING WITH TOE (AT PIER)

SCALE: 1: 20 @ A1



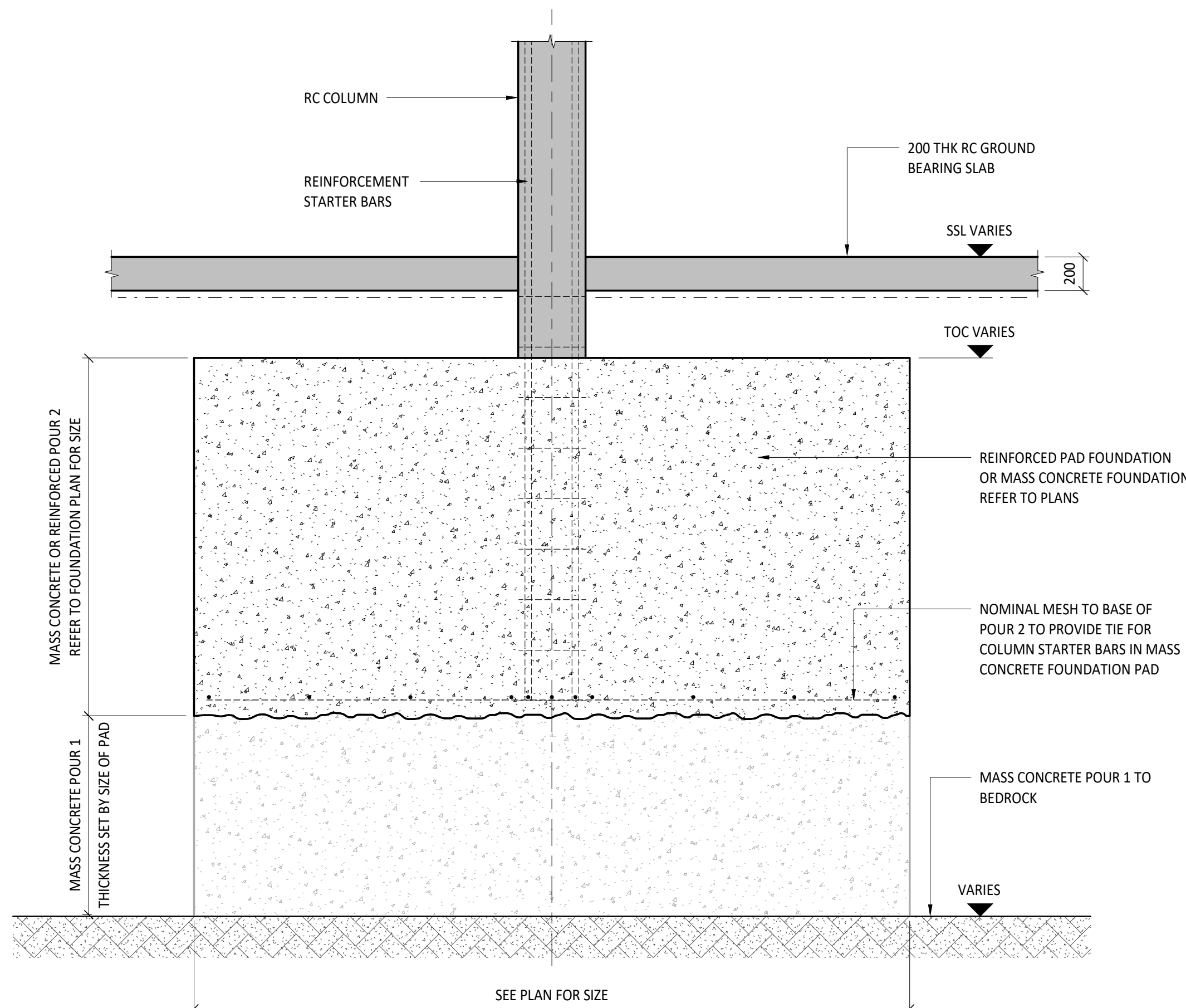
TYP6 - TYPICAL SLAB FOLD DETAIL

SCALE: 1: 20 @ A1



TYP7 - TYPICAL MEZZANINE COLUMN BASE DETAIL

SCALE: 1: 20 @ A1

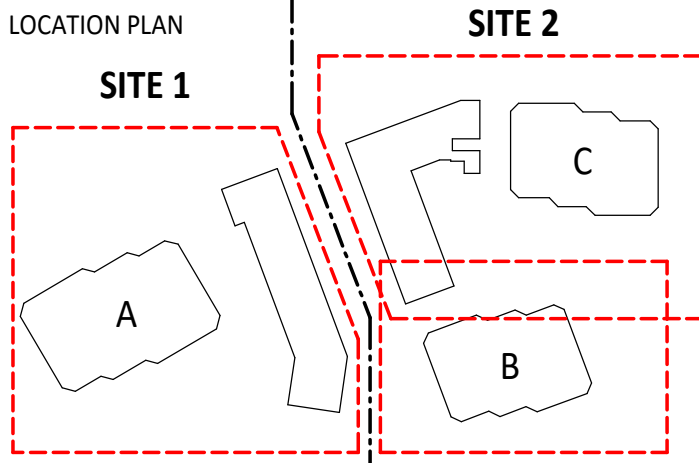


TYPICAL PAD FOUNDATION POUR SEQUENCE

SCALE: 1: 25 @ A1

- STANDARD NOTES**
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS AND THE SPECIFICATIONS.
 2. THIS DRAWING SHOULD NOT BE SCALED.
 3. ALL DIMENSIONS ARE TO BE VERIFIED BY THE CONTRACTOR ON SITE.
 4. ALL DISCREPANCIES SHOULD BE REPORTED TO C.A. PRIOR TO THE COMMENCEMENT OF WORKS.
 5. ALL DIMENSIONS IN mm, ALL LEVELS IN m U.N.O.

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NOTES

20.11.20	P02	STAGE 3B UPDATE	MJF	DP
06.11.20	P01	STAGE 3B ISSUE	MJF	DP
Date	Rev	Description	Drawn	Chkd



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Project
VICTORIA RIVERSIDE, DANTZIC STREET MANCHESTER

Title
SUBSTRUCTURE DETAILS - SHEET 1

INFORMATION					
Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1127-01	Varies	Nov 20	MJF	DP	S1
Drawing Number					Revision
VRS-CIV-00-XX-DR-S-5101					P02

APPENDIX D

Extracts from Previous Site Investigation Report

GAS AND WATER MONITORING RESULTS



Date:	29-Nov-14	10-Jan-14	19-Jan-14									
Visit Number	1	2	3	4	5	6	7					
Atmos Press mb	1011	1007	1008									
Pressure Trend	STEADY	STEADY	RISING									
Air Temp °C	8	7	5									
Cloud cover	OVERCAST	OVERCAST	OVERCAST									
Wind velocity	LIGHT	STRONG	MODERATE									
Precipitation	DRY	DRY	DRY									
State of Ground	DRY	DAMP	DAMP									
BH1	CH ₄ (%) (max/steady):	NIL	NIL									
	CO ₂ (%) (max/steady):	NIL	0.5	0.6								
	O ₂ (%) (max/steady):	19.5	17.6	18.0								
	H ₂ S (ppm) (max/steady):	NIL	NIL	NIL								
	CO (ppm) (max/steady):	NIL	NIL	NIL								
	PID (ppm) (max/steady):	NIL	NIL	NIL								
	Flow (l/hr) (max/steady):	<0.1	<0.1	<0.1								
	Water Level / depth to base (m):	3.62	3.46	3.51								
BH2	CH ₄ (%) (max/steady):	NIL	NIL	NIL								
	CO ₂ (%) (max/steady):	NIL	1.1	1.2								
	O ₂ (%) (max/steady):	19.8	12.9	15.9								
	H ₂ S (ppm) (max/steady):	NIL	NIL	NIL								
	CO (ppm) (max/steady):	NIL	NIL	NIL								
	PID (ppm) (max/steady):	NIL	NIL	NIL								
	Flow (l/hr) (max/steady):	<0.1	<0.1	<0.1								
	Water Level / depth to base (m):	3.41	DRY	DRY								
BH3	CH ₄ (%) (max/steady):	NO INSTALLATION	NIL	NIL								
	CO ₂ (%) (max/steady):	NO INSTALLATION	0.9	0.8								
	O ₂ (%) (max/steady):	NO INSTALLATION	17.7	18.4								
	H ₂ S (ppm) (max/steady):	NO INSTALLATION	NIL	NIL								
	CO (ppm) (max/steady):	NO INSTALLATION	NIL	NIL								
	PID (ppm) (max/steady):	NO INSTALLATION	NIL	NIL								
	Flow (l/hr) (max/steady):	NO INSTALLATION	<0.1	<0.1								
	Water Level / depth to base (m):	NO INSTALLATION	3.55	3.52								
BH4	CH ₄ (%) (max/steady):	NO INSTALLATION	NIL	NIL								
	CO ₂ (%) (max/steady):	NO INSTALLATION	0.2	0.3								
	O ₂ (%) (max/steady):	NO INSTALLATION	19.7	19.9								
	H ₂ S (ppm) (max/steady):	NO INSTALLATION	NIL	NIL								
	CO (ppm) (max/steady):	NO INSTALLATION	NIL	NIL								
	PID (ppm) (max/steady):	NO INSTALLATION	NIL	NIL								
	Flow (l/hr) (max/steady):	NO INSTALLATION	<0.1	<0.1								
	Water Level / depth to base (m):	NO INSTALLATION	3.62	3.58								
BH7	CH ₄ (%) (max/steady):	NIL	NIL	NIL								
	CO ₂ (%) (max/steady):	1.5	NIL	NIL								
	O ₂ (%) (max/steady):	16.4	19.5	19.8								
	H ₂ S (ppm) (max/steady):	NIL	NIL	NIL								
	CO (ppm) (max/steady):	NIL	NIL	NIL								
	PID (ppm) (max/steady):	NIL	NIL	NIL								
	Flow (l/hr) (max/steady):	<0.1	<0.1	<0.1								
	Water Level / depth to base (m):	DRY	3.18	3.15								
BH10	CH ₄ (%) (max/steady):	NO INSTALLATION	NIL	NIL								
	CO ₂ (%) (max/steady):	NO INSTALLATION	NIL	NIL								
	O ₂ (%) (max/steady):	NO INSTALLATION	19.7	19.9								
	H ₂ S (ppm) (max/steady):	NO INSTALLATION	NIL	NIL								
	CO (ppm) (max/steady):	NO INSTALLATION	NIL	NIL								
	PID (ppm) (max/steady):	NO INSTALLATION	NIL	NIL								
	Flow (l/hr) (max/steady):	NO INSTALLATION	<0.1	<0.1								
	Water Level / depth to base (m):	NO INSTALLATION	3.55	3.45								

CCG-CMS-FO-129

Issue 2

Job No: 14/7780

Site: DANTZIC STREET, MANCHESTER

Instrument: GA2000

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London, Liverpool and Glasgow.

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- » Contaminated Land
- » Flood Risk and Drainage
- » Asbestos
- » Invasive Species
- » Land Remediation
- » Project Management
- » Land Drilling