



VIADUX, MANCHESTER

**LISTED BUILDING REPORT
STRUCTURAL & CIVIL ENGINEERING**

Project No 1910-12
Dec 2021
Rev: P04
VIA-REN-0-XX-RP-S-00001

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P01	Listed Building Structural Report	P Clayton	K Gilsenan	28.04.20
P02	Updated for Revised Stair and Lift Link	P Clayton	K Gilsenan	26.05.20
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EXECUTIVE SUMMARY

Renaissance have been commissioned by Salboy to provide structural engineering services in connection with the development of the Viadux project.

The overall Viadux development includes the construction of a 40-storey residential tower (Phase 1), 16 storey office building (Phase 2), connecting podium structure, and conversion of the Grade II listed masonry Viaduct. The proposed buildings are to be built over the existing Viaduct structure that dates from the late 1860's and was constructed as part of Manchester Central Station.

This document provides an overview of the work required to facilitate the development and identifies the proposed mitigation measures to ensure the fabric, load bearing capacity and the stability of the existing Grade II listed structure is maintained both permanently and during the course of the works. The main body of the report should be read in conjunction with the structural drawing package.

Key interventions proposed to the listed structure comprise of:

1. Localised removal of the existing bridge over Great Bridgewater Street
2. Enlargement of openings within the existing abutment to Great Bridgewater Street
3. New penetrations through the arches to accommodate proposed structural columns for the new development
4. New Foundation works
5. New Stair works
6. Localised removal of brickwork to accommodate the proposed office development core
7. Temporary openings formed through the arches for tower crane installation

Penetrations through the arches are required in order to found the proposed Phase 1 and Phase 2 structures into the ground. The superstructure arrangement of both Phase 1 and 2 has been developed in order to minimise the number and size of the openings through the listed building by providing transfer structures at level 02. Openings are to be centred on the crowns of the existing segmental arches to minimise works to the existing viaduct pier structures so far as possible.

The RC cores of both the Phase 1 and Phase 2 developments have been designed to reduce in size as they pass through the listed structure in order to minimize the amount of demolition works required for these elements.

In order to safeguard the existing structures it is proposed to provide a movement joint between the new tower structure and the existing viaduct. This approach allows any differential movement between the two systems to be accommodated. Piled foundation solutions are proposed for the new structures such that the induced settlements of the existing structure are within acceptable limits.



Figure 1.1 – Scheme Overview

1.0 INTRODUCTION

This document provides an overview of the work required to facilitate the development and identifies the proposed mitigation measures to ensure the fabric, load bearing capacity and the stability of the remaining structure is maintained both permanently and during the course of the works. The report is to be read in conjunction with the information contained within the appendices and the wider design team's information.

2.0 SITE DESCRIPTION

2.1 Site Location

The Viadux development site is located in the city centre of Manchester (National Grid Reference: 383572, 397621 & Postcode M1 5NZ). The site is bounded by Great Bridgewater Street to the north, Albion Street and the Metrolink to the east, Trafford Street and Deansgate-Castlefield Tram Station to the south, and the Hilton Hotel Slot Site to the west. The overall development site is approximately 0.7ha (7000m²) with Phase 2 being circa 0.405ha (4050m²) of this. The overall site and extent of phase 2 is indicated in Figure 2.1.



Figure 2.1 Site Location

The site is presently occupied by a single storey Grade II listed masonry viaduct, formed by arches at ground floor level and an active service yard above at first floor level that is in use by Manchester Central Conference Centre. The topographical survey indicates that the ground floor level is circa 34.9–35.5m AOD and the service yard level is circa 43.0–43.4m AOD.



Figure 2.2 – Site Prior to Viaduct Construction (1848)



Figure 2.3 – Site with Viaduct constructed

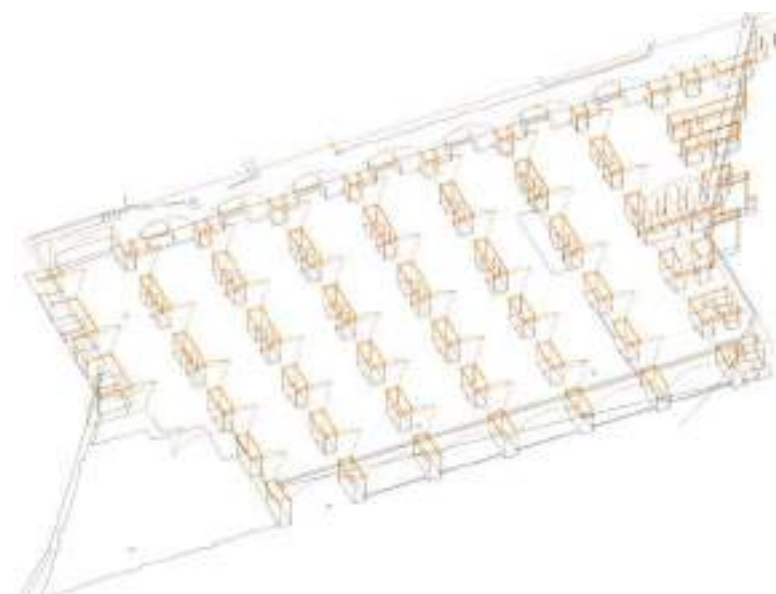


Figure 2.4 - Isometric of Viaduct Arches

2.2 Site History

The site was first developed around the beginning of the 19th century, prior to which it was part of an ancient wood and parkland. Maps from 1848-1851 show that prior to the construction of the viaduct, the site was split with Trumpet Street crossing east to west (Figure 2.2). The northern area was occupied by residential terraces, a school and a burial ground. Trumpet Street Cotton Mill occupied part of the northeast of the site. The southern area of the site contained an iron foundry and a cotton mill.

The viaduct was constructed circa 1876-1879 to support the railway lines and platforms to Manchester Central Station to the north of the site. Initially the disused burial ground and commercial properties shared the site with the viaduct, occupying the northwest corner.

By 1908 Trumpet Street no longer crossed the site, the burial ground was no longer mapped and all buildings to the north-western corner had been demolished.

By 1948 an automobile engineering works occupied the north-western corner which by 1960 became a works. Between 1960 and 1973 the railway lines above the viaduct were removed and only the platforms remained as the station was then disused. The works was only demolished circa 1999, when the majority of the site was mapped as a carpark. It remained in use as a carpark to the undercroft of the viaduct prior to the Viadux development commencing, with the upper level being utilised as a service yard by Manchester Central Convention Complex.

2.3 Grade II Listed Viaduct

The site is currently developed with a Grade II viaduct structure that dates from circa 1876-1879 and is to be retained and incorporated into the scheme (Figure 2.4). The first floor of the viaduct structure is part of a larger structure constructed as part of the Manchester Central Station development. It connects to the Manchester Central Grade II* structure to the north via a cast iron arch bridge over Great Bridgewater Street. To the south the viaduct structure extends forming Deansgate Locks at ground level and Deansgate-Castlefield Tram station at upper deck. The upper deck is accessed via a ramp over Trafford Street and provides access to the service yard that is used by Manchester Central Conference Centre. The upper deck also provides public access between Windmill Street to the north and the Deansgate-Castlefield Tram station. The ground floor level was previously used for car parking and has recently become unoccupied.

The viaduct structure is of load bearing masonry construction with segmental arches spanning circa 9.15m between brick piers. Pointed arches are provided between the piers to allow for circulation through the structure at ground floor.

The first floor is currently used as a service yard with HGV access. A review of loading plans provided by Manchester Central indicate that a detailed load assessment to current codes has not been undertaken. Restrictions on arch loading are to be addressed within the construction methodology.

3.0 PROPOSED DEVELOPMENT

The overall Viadux development is comprised of the following elements, split into the proposed construction phasing.

Details of the proposed interventions into the listed building fabric are discussed in further detail in Section 4.

3.1 *Phase 1 Residential Tower*

Construction of 40-storey residential building over the Western part of the site. Associated interventions to the listed fabric include;

- Creation of 12 no. localised openings within the arch barrels for the tower columns
- Creation of one no. larger opening for the proposed residential core
- Removal of the Western end of the existing bridge over Great Bridgewater Street
- One no. temporary opening through the arches for the insertion of a tower crane
- Stair and Lift construction adjacent to the viaduct to create a public link between Great Bridgewater Street and the elevated Deansgate-Castlefield tram stop
- Creation of four no. localised openings within the arches for the landscaped podium deck support columns at the Phase 1 and 2 interface

3.2 *Phase 2 Commercial Office Development*

Construction of a 16-storey commercial office building to the east of the site. Associated interventions to the listed fabric include;

- Creation of six no. localised openings within the arch barrels for the office development columns
- Removal and replacement of localised section of viaduct abutment to accommodate the office development core
- Removal of the central section of the existing bridge over Great Bridgewater Street
- Enlargement of four no. existing openings within the Great Bridgewater Street abutment fronting Great Bridgewater Street
- Temporary opening through the arches for the insertion of a tower crane

4.0 PROPOSED STRUCTURAL INTERVENTIONS

This section describes the proposed structural interventions. Reference should also be made to the structural drawings provided within the appendices.

stability of the retained abutments to either side of Great Bridgewater Street.

In addition to the bridge removal works, localised works to form new edge protection to the Level 01 areas are required. Modifications will also be required to the 1980s precast highway bridge elements in order to provide suitable vehicle restraint and edge protection to the affected areas.

Refer to Appendix A for the bridge removal drawing series. Figure 4.1 below provides an overview of the proposals.

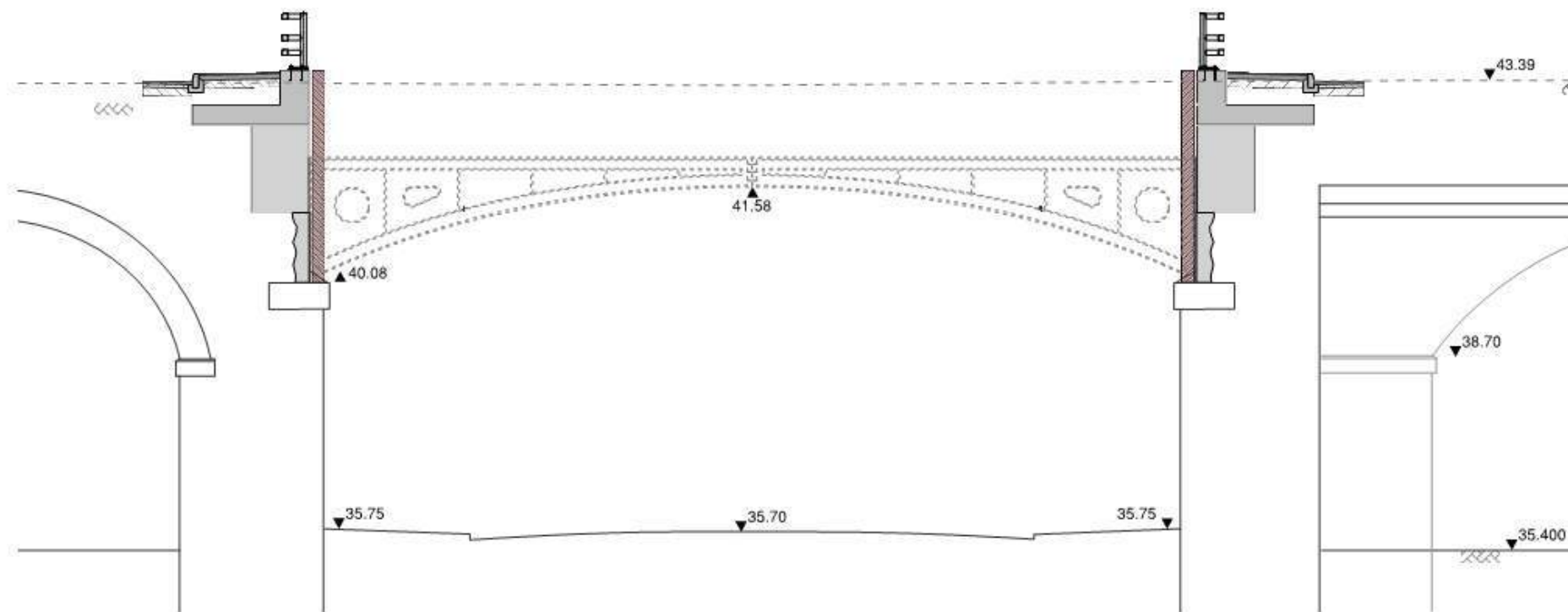


Figure 4.1 – Great Bridgewater Street Elevation

4.1 Great Bridgewater Street Bridge Removal

The existing bridge structure is single span, comprised of curved cast iron girders at 1.8m centres supported on masonry abutments to either side of Great Bridgewater Street. The proposals include the removal of a number of girders to the western end of the bridge and within the central section to provide an improved open environment to the proposed retail units on Great Bridgewater Street.

Based upon a detailed structural appraisal including 2D modelling of the multi-span viaduct arches and 3D finite element analysis models, the existing iron ribs provide negligible propping to the existing abutments. As such, the bridge removal works are not considered to compromise the

4.2 Great Bridgewater Street Abutment Openings

Where the bridge sections are to be removed, the existing openings within the Great Bridgewater Street abutment to the Viadux development site are to be enlarged to create enhanced frontages onto Great Bridgewater Street.

In order to maintain the existing load path through the structure and into the foundations as much as possible, a picture frame of new structure is proposed to frame the new openings. This approach will minimise any increases in stresses to the existing fabric and minimises the loss of historic building fabric.

The combination of partial bridge removal to create an open street environment and minimal structural enlargement of the existing viaduct abutment openings brings the viaduct into a sustainable, long-term use which will help ensure long-term security and protection of the structure.

Figure 4.2 below demonstrates the proposed approach including consideration of the temporary works required to carry out the intervention. Refer to the Appendices for further details.

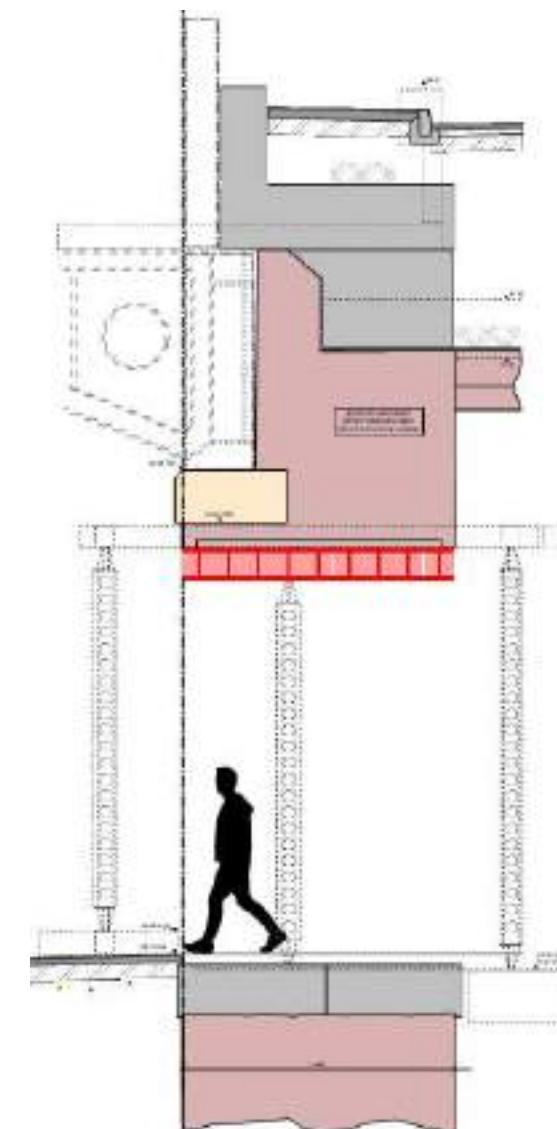


Figure 4.2 – Great Bridgewater Street Abutment Opening Section

4.3 Penetrations Through Arches

New penetrations through the arches are required in order to found the proposed Phase 1 and 2 structures into the ground. The superstructure arrangements of both Phase 1 and 2 have been developed in order to minimise the number and size of the openings through the listed building by providing transfer structures at level 02.

Openings are to be centred on the crowns of the existing segmental arches to minimise works to the existing viaduct pier structures. Central placement of the openings to the arches avoids unnecessarily reducing the structural capacity of the arches. All penetrations will be designed, with specialist advice, to maintain the continuous waterproofing above the arch structure, ensuring long-term durability of the viaduct.

In order to safeguard the existing structure, it is proposed to provide a movement joint between the new structural columns and the viaduct. This ensures that any differential movement between the two systems can be accommodated.

RC thrust frames are proposed to trim the new openings and shall be designed to accommodate the significant thrust forces present within the arch structures. The force will be transferred across the arch, maintaining the integrity of the multi-span construction. The magnitude of the force within the masonry arch rings has been derived through a detailed back assessment of the arch structures. The construction sequencing of this element of works requires careful consideration to ensure the forces are transferred safely into the new structural elements. The drawings presented within Appendix A provide details of the new trimming structures and the construction methodology for the works.

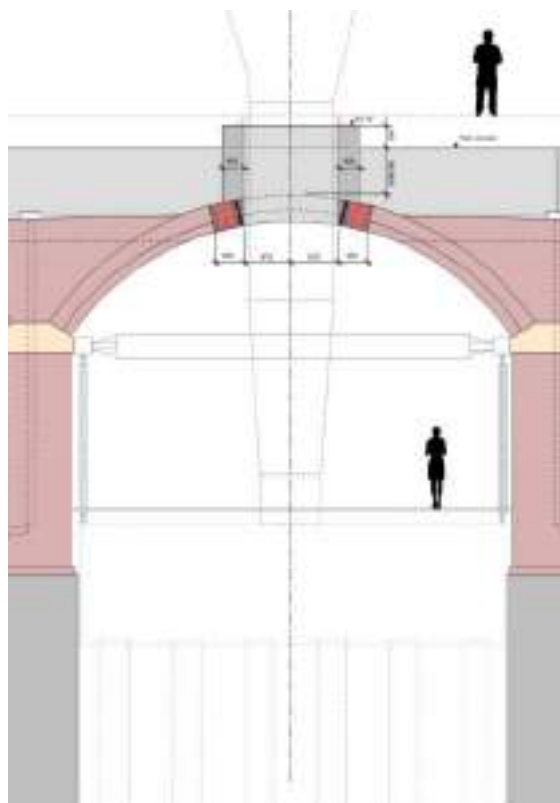


Figure 4.3 – Arch Column Penetration Section

4.4 New Foundations Between the Piers

The ground investigation on the site indicates weathered sandstone at circa 4.5-6.0m depth, with drift deposits and made ground above. As the made ground and drift deposits between the arch foundation are highly variable a piled assisted raft has been discounted due to the risk of excessive settlement of the drift deposits.

The proposals are therefore to provide a piled foundation solution, with the length of piles designed by the Contractor to ensure that the group pile settlements are within acceptable limits. This foundation solution will not contact or impose additional load onto the viaduct foundations. Specialist vibration and movement monitoring techniques will be employed to protect the listed structure and ensure that differential settlement between the piers remains within acceptable limits to avoid damage to the existing structure.

4.5 Podium Structure Interface (Phase 1 and 2)

A landscaped podium structure connecting the residential tower and office building is to be constructed at 2nd floor level. To minimise the impact on the operation of the service yard the structure is to comprise long span steel beams onto four columns. In order to safeguard the existing structure from the proposed column loads, 4 no. arch openings are proposed to accommodate the podium support columns. These are to be formed in a similar manner to the main office and residential tower arch openings.

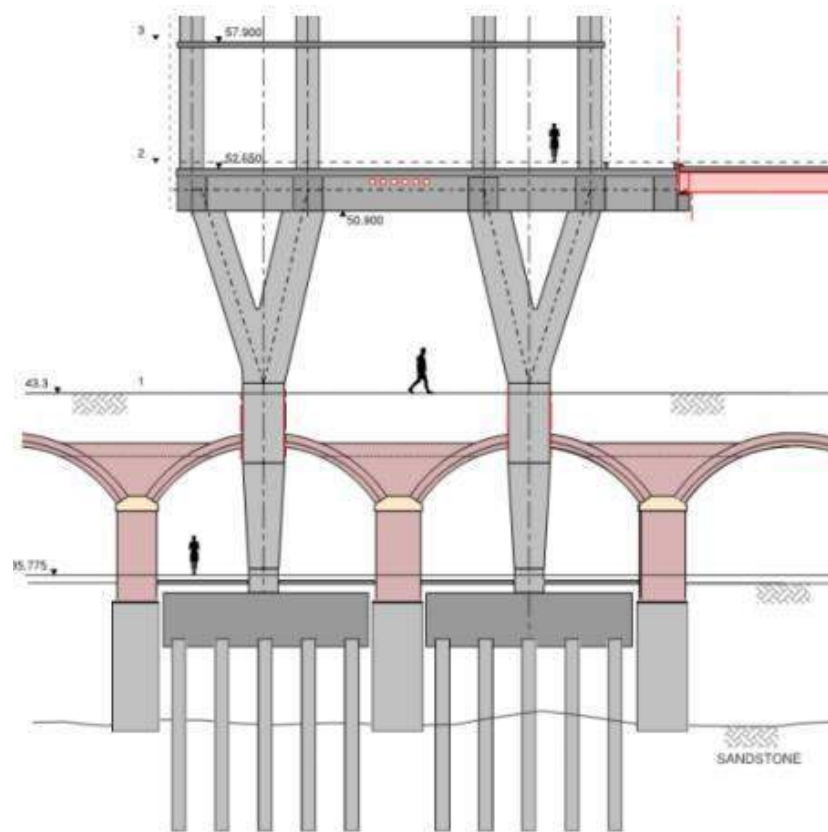


Figure 4.4 – Proposed Foundation GA Section

4.6 New Stair Works

A new public stair and lift is proposed as part of the development to link Great Bridgewater Street to the upper deck and provide pedestrian access to the Deansgate Castlefield Metrolink Station.

As part of the design's development and in order to minimise works to the existing listed structure, the proposed new stair and lift link has been relocated to sit outside of the footprint of the viaduct structure, immediately adjacent to the western abutment of the viaduct. In conjunction, the Spanish Staircase in the original consent, at the south side of the junction of Great Bridgewater Street and Watson Street, is to be replaced with a residential entrance. This entrance will make use of the existing structural opening and therefore there are no significant structural alterations to the existing fabric at this location. This retains this elevation of the viaduct and brings it back to a sustainable use.

The relocation of the stair and lift link results in a significant reduction in the loss of listed building fabric associated with the development works, when compared with a scheme to insert the new link structure through the listed viaduct.

The new stair and lift structural scheme has been carefully considered to provide a clearly legible load path and minimise works to the listed building. Two anchor points are required between the new stair and the Viaduct abutment walls. These locations are to be detailed with bolted connections such that they are reversible, with minimal disruption to the listed fabric. Figure 4.5 below gives an overview of the proposed structural scheme and fixing points. For further detail see Appendix D.

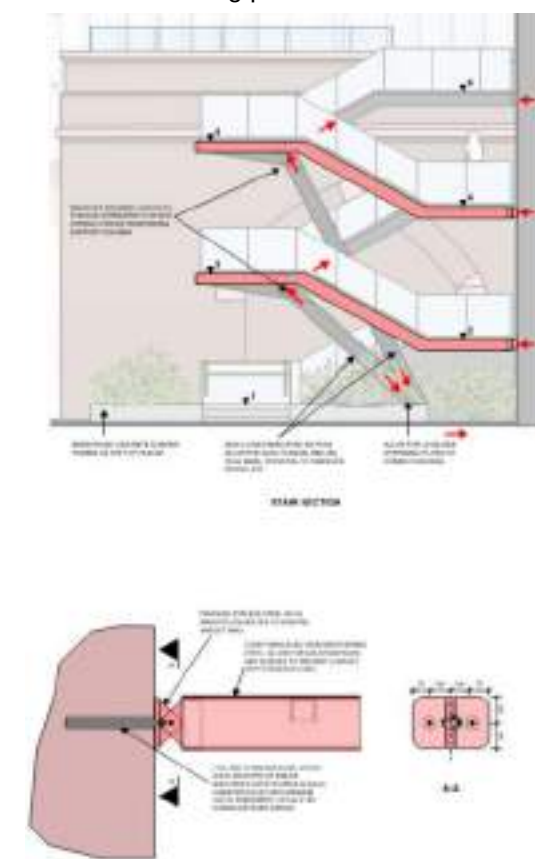


Figure 4.5 – New Stair Works GA Section and Fixing Point Detail

4.7 Phase 1 Residential Core Penetration

In order to accommodate the Phase 1 residential tower RC core, one no. opening is required through the arches.

The tower core and overall tower stability system has been designed to minimise the amount of arch demolition works required. The core opening is proposed to sit fully within a single segmental arch span to avoid demolition to the existing viaduct piers, and to achieve the minimum demolition solution, the tower stability system has been designed such that the RC core can reduce in size as it passes through level 01, requiring significant transfer structures at Level 02.

In order to accommodate the large thrust forces present within the arch barrels, a fabricated steel beam grillage has been designed to act as a thrust frame within the arch barrels. This frame system has been designed to minimise movements to acceptable limits and minimise the risk of cracking to the arch structure locally. The steel frames are encased within RC concrete walls to provide maximum stiffness.

Reference should be made to the drawings provided in the Appendices for details of the construction and methodology.

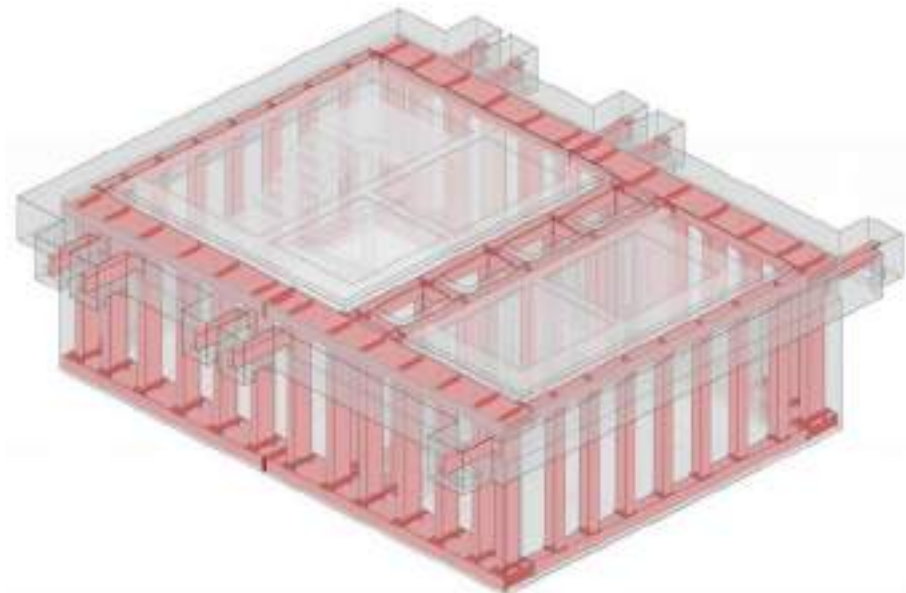


Figure 4.6 – Phase 1 Core Penetration Thrust Frames – 3D Overview

4.8 Phase 2 Office Core – Abutment Removal Works

In order to accommodate the Phase 2 commercial office RC core, a localised area of the Viaduct Eastern abutment structure is to be removed and replaced with a piled RC and steel composite abutment framing system.

In order to minimise the amount of demolition works required, the office core has been designed to reduce in size as it passes through level 01 via cantilevering of the core walls above level 02. This reduces the footprint of the core to the minimum required as it meets the listed building.

In order to replace the mass masonry abutment structure, a dedicated abutment buttressing structure is proposed to be inserted prior to demolition of the section of existing abutment. The proposed structure includes the insertion of fabricated steel elements cantilevering up from a new piled foundation structures to provide sufficient buttressing to the arches and minimise the risk of movement and cracking of the listed structure. The steel frames are to be encased within RC walls to maximise the stiffness of the proposed abutment frames and further minimise movements. Reference should be made to the drawings provided in the Appendices for details of the construction and methodology.

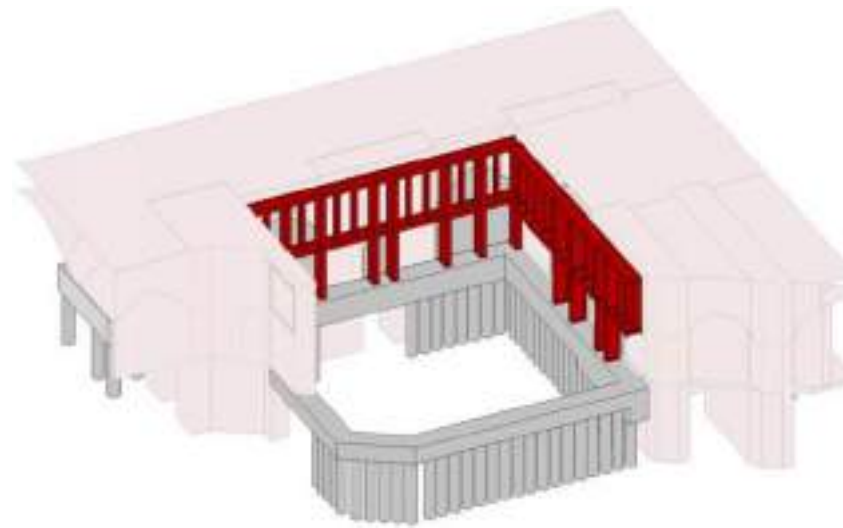


Figure 4.7 – Phase 2 Abutment Removal Proposals – 3D Overview

4.9 Temporary Tower Crane Opening Works

Further to discussions with the Main Contractor, two no. tower cranes are required to construct the development. The tower cranes are placed central to segmental arch bays to simplify the penetration works required through the arches. The structural works required to form these openings are designed to be temporary, such that the arch brickwork is reinstated once the tower cranes are removed.

Reference should be made to the drawings in the appendices which show the structural proposals.

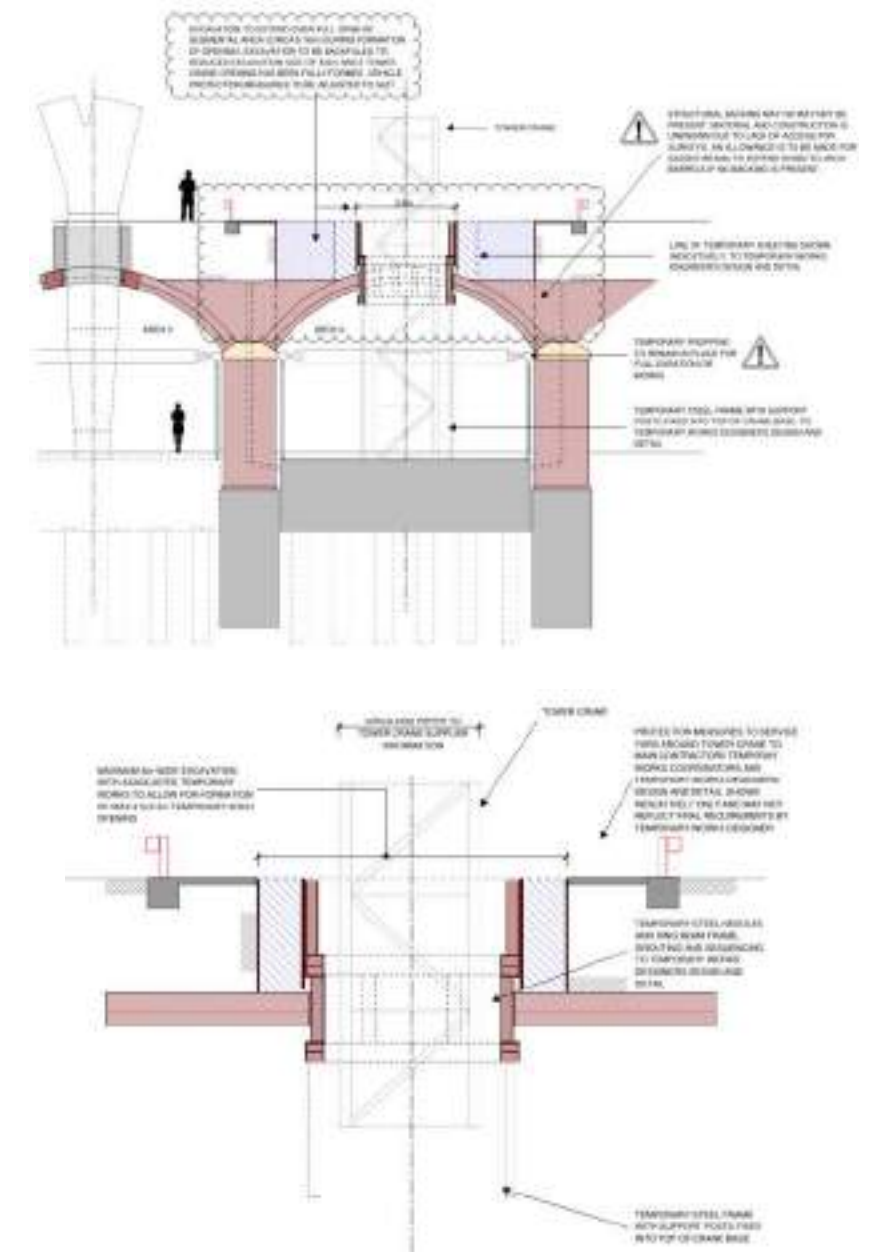
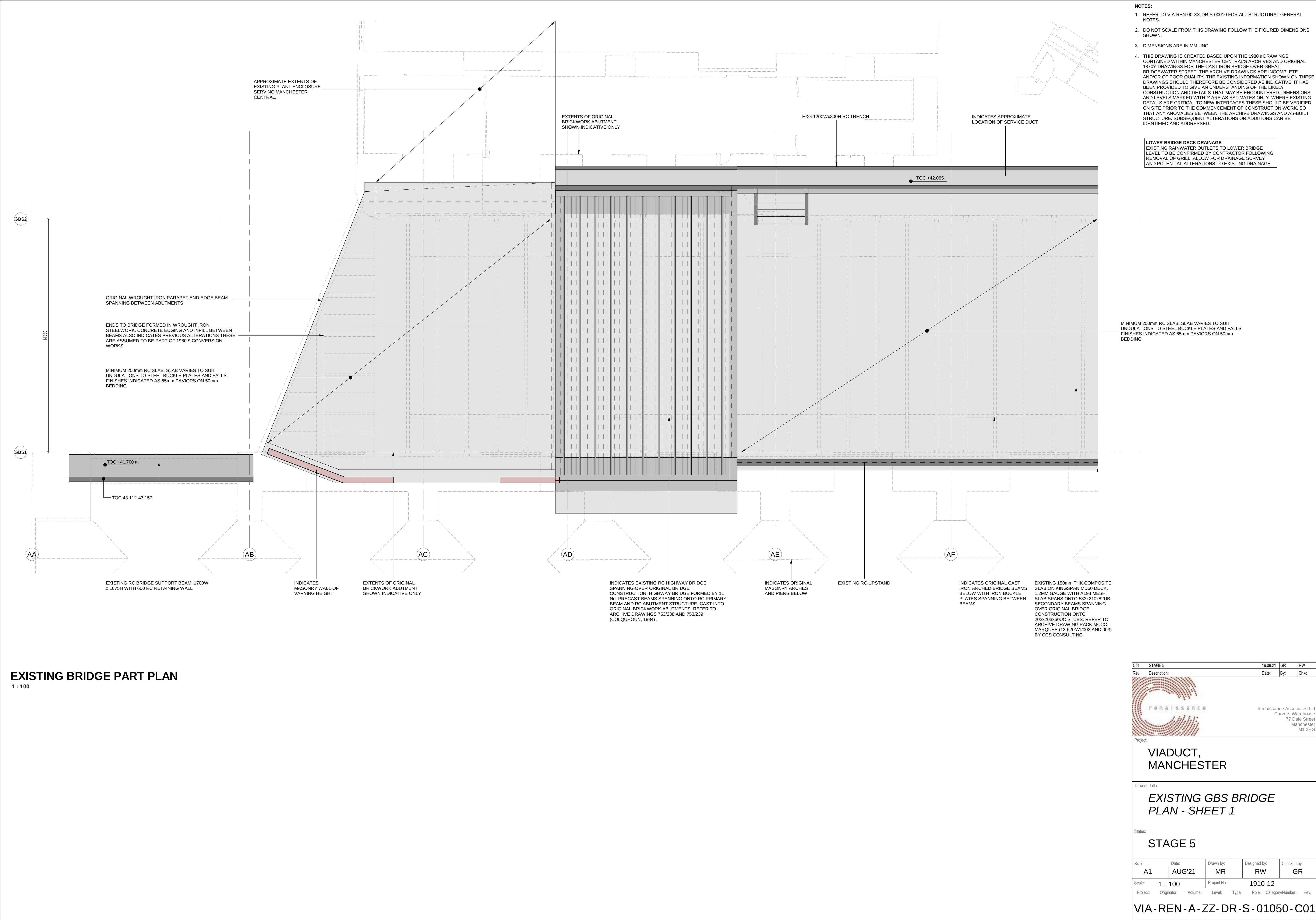


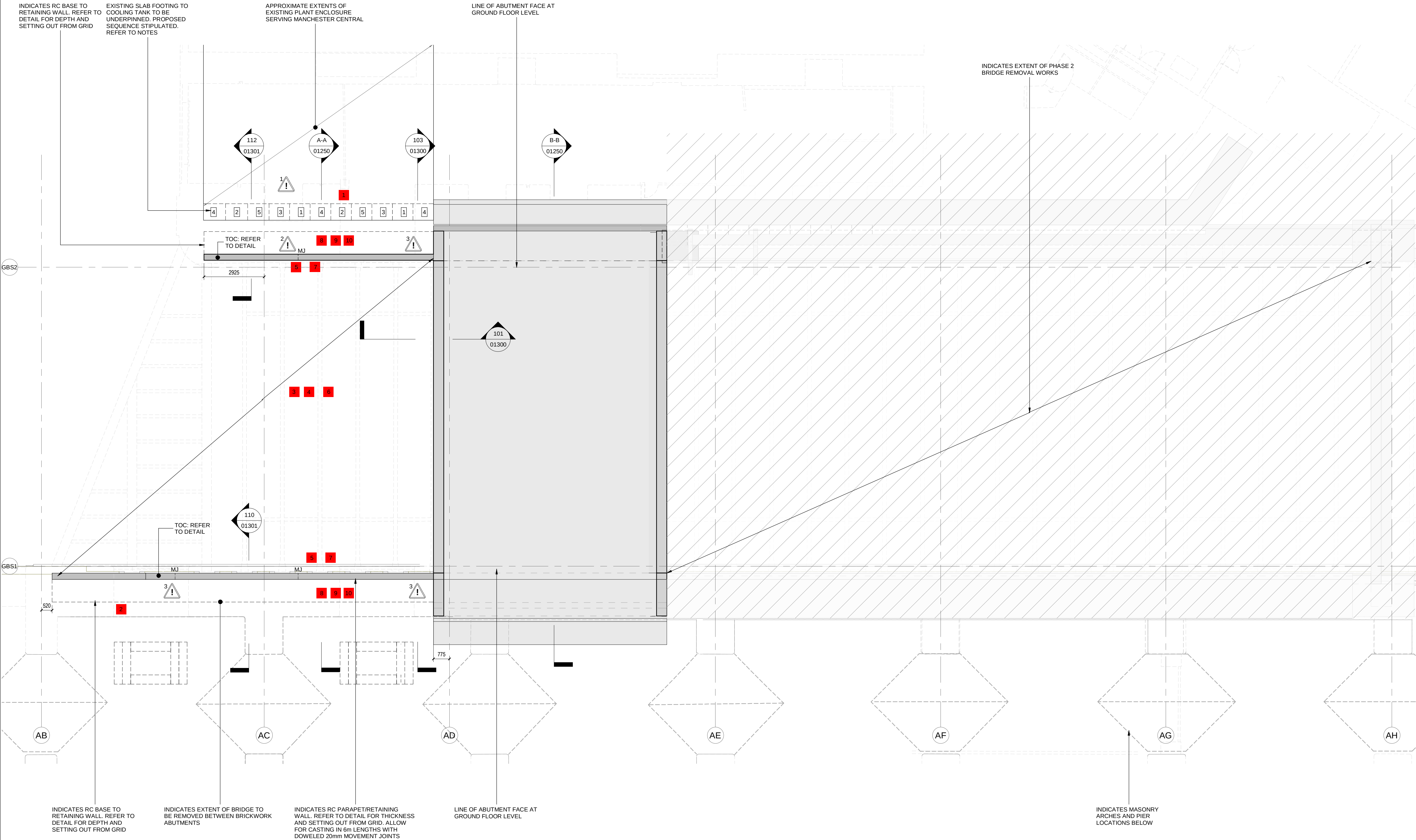
Figure 4.8 – Temporary Tower Crane Opening Proposals

APPENDIX A

GREAT BRIDGEWATER STREET BRIDGE
REMOVAL DRAWINGS



C01	STAGE 5	19.08.21	GR	RW
Rev:	Description:	Date:	By:	Chkd:
 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project: VIADUCT, MANCHESTER				
Drawing Title: EXISTING GBS BRIDGE PLAN - SHEET 1				
Status: STAGE 5				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	AUG'21	MR	RW	GR
Scale:	1 : 100	Project No:	1910-12	
Project:	Originator:	Volume:	Level:	Type:
			Role:	Category/Number:
VIA-REN-A-ZZ-DR-S-01050-C01				



PROPOSED GBS BRIDGE PLAN

OUTLINE CONSTRUCTION METHODOLOGY

THE FOLLOWING INDICATES THE ASSUMED CONSTRUCTION SEQUENCING FOR PHASE 1 THAT WILL BE ADOPTED WITHIN THE PERMANENT DESIGN, TO INDICATE A VIABLE WAY OF UNDERTAKING THE WORK. THE CONTRACTOR IS TO DEVELOP A DETAILED CONSTRUCTION METHODOLOGY WITH THEIR TEMPORARY WORKS ENGINEER TO ENSURE THAT THE WORKS CAN BE UNDERTAKEN SAFELY.

STAGE	ACTIVITY	STAGE	ACTIVITY
1	UNDERPINNING WORKS TO PLANT ENCLOSURE SLAB ALONG THE LENGTH OF THE BRIDGE REMOVAL SECTION. LOCALISED SECTIONS OF MAX 1m WIDTH TO BE UNDERPINNED IN A HIT AND MISS SEQUENCE TO ENSURE THAT THE OVERALL LATERAL STABILITY OF THE SLAB IS NOT COMPROMISED. MASS CONCRETE UNDERPINNING TO BE CONSTRUCTED IN LIFTS TO AVOID PLACING HIGH LATERAL FORCES ON THE EXISTING MASONRY RETAINING WALL.	2	CLOSE ROAD, ERECT MOBILE CRANE AND CAREFULLY REMOVE BRIDGE BEAMS ONE AT A TIME, WORKING FROM THE END. THE BUCKLE PLATE IS TO BE CUT OUT IN SECTIONS AS THE WORKS PROCEED TO ENSURE STABILITY OF THE ADJACENT ARCHES IS MAINTAINED. WROUGHT IRON PARAPET ON THE WATSON STREET END TO BE CAREFULLY REMOVED AND KEPT FOR REUSE.
2	BATTER BACK THE GROUND ON THE VIADUX SIDE. EXCAVATION AND TEMPORARY WORKS REQUIREMENTS TO TEMPORARY WORKS ENGINEERS DESIGN AND SPECIFICATION.	3	INSTALL STAINLESS STEEL TIES/ DOWELS TO STITCH EXISTING MASONRY. CAST MASS CONCRETE INFILLS
3	INSTALL CRASH DECK BELOW BRIDGE TO PROTECT PEDESTRIANS AND VEHICLES. REQUIREMENTS TO BE AGREED WITH HIGHWAYS AGENCY	4	CONSTRUCT RETAINING WALLS
4	REMOVE FINISHES/ FILL MATERIAL FROM BRIDGE SECTIONS TO BE DEMOLISHED. EXCAVATION SHOULD BE UNDERTAKEN EVENLY IN MAXIMUM 0.5m INCREMENTS ACROSS THE COMPLETE AREA TO ENSURE UNBALANCED LOADING ON THE EXISTING CAST IRON ARCHES IS MINIMISED.	5	APPLY WATERPROOFING (SUITABLY LAPPED TO EXISTING) AND BACKFILL. LEVELS TO BE BROUGHT UP IN MAX 150mm AND COMPACTED WITH A NON-PERCUSSIVE TECHNIQUE
5	CAREFULLY REMOVE FINISHES AND BREAK OUT BRICKWORK BETWEEN CAST IRON ARCHES. INSTALL TEMPORARY BRACING TO ARCHES. REMOVE BUCKLE PLATES, THEN REMOVE IRON ARCHES	6	INSTALL BRICK FACING/ REMOVE CRASH DECK

UNDERPINNING NOTES

- THE CONTRACTOR IS TO ALLOW FOR APPROPRIATE TEMPORARY WORKS TO ALLOW FOUNDATIONS TO BE INSTALLED IN A SAFE MANNER AND TO ENSURE ADJACENT FOUNDATIONS REMAIN STABLE
- ALL CONCRETE TO BE MINIMUM C16/20 STRENGTH CLASS TO ACHIEVE ACCEC CLASSIFICATION AC-3. CONCRETE MIX TO COMPLY WITH BRE SPECIAL DIGEST 1:SD1 THIRD EDITION (2005). CONCRETE DESIGN BY SUPPLIER
- THE CONTRACTOR IS TO ADVISE ON PROPOSED POSITION OF ANY CONSTRUCTION JOINTS AND SIZE OF BAYS IF DIFFERENT FROM THE SPECIFICATION. THESE ARE TO BE AGREED WITH THE STRUCTURAL ENGINEER PRIOR TO CONCRETING.
- DRY PACK BETWEEN TOP OF UNDERPINNING AND EXISTING FOUNDATION WITH A PROPRIETARY NON-SHRINK GROUT. ALLOW FOR FOSROC CONBEXTRA GP (OR EQUIVALENT), INSTALLED IN ACCORDANCE WITH MANUFACTURER'S DETAILS AND RECOMMENDATIONS

UNDERPINNING SEQUENCE

- EXCAVATE THE INDIVIDUAL BAY TO BE UNDERPINNED TO THE NEW FORMATION LEVEL
- SOFFIT OF EXISTING FOUNDATIONS IS TO BE THOROUGHLY CLEANED AND CUT BACK TO A SOUND FACE BEFORE CONCRETING AND DRY PACKING
- THE EXISTING RAFT SLAB IS TO BE RETAINED THROUGHOUT. EXTRA PRECAUTION IS TO BE TAKEN IN EXCAVATING FURTHER TO ALLOW UNDERPINNING. BAY WIDTHS ARE TO BE LIMITED IN WIDTH (1.0m MAX) OR PERMANENT PROPS INSTALLED
- THE SEQUENCE OF UNDERPINNING IS TO BE AS PER THE DRAWING AND ANY DEVIATION AGREED WITH THE ENGINEER BEFORE PROCEEDING WITH THE WORKS. EACH BAY (INCLUDING EXCAVATION) TO BE 1.0m WIDE (MAX) AND TO BE SEQUENCED IN CONJUNCTION WITH SEQUENCING PLAN. A 1-5 NUMBERING SYSTEM FOR BAYS IS PROVIDED FOR CONSTRUCTION. WORKS TO BE SEQUENCED TO MAINTAIN ADEQUATE FOUNDATION SUPPORT TO THE BUILDING AT ALL TIMES.
- EXCAVATE AND CAST BAYS MARKED 1. ALLOW 24-48 HOURS TO CURE BEFORE DRY PACKING WITH A NONSHRINK GROUT. ALLOW 24-48 HOURS FOR GROUT TO CURE BEFORE EXCAVATING A SUBSEQUENT BAY
- EXCAVATE AND CAST BAYS MARKED 2 AND DRY PACK AS ABOVE
- REPEAT FOR 3,4, & 5 UNTIL UNDERPINNING COMPLETE OR SIMILAR SEQUENCING (NOTE: SEQUENTIAL ORDERING FOR BAYS IN A LENGTH OF WALL IS 1ST BAY, 3RD BAY, 5TH, 2ND, 4TH AND SO ON, SUCH THAT A SUBSEQUENT BAY IS NOT LOCATED ADJACENT TO A MOST RECENTLY CONSTRUCTED BAY UNO)

NOTES:

- REFER TO VIA-REN-00-XX-DR-S-00010 FOR ALL STRUCTURAL GENERAL NOTES
- DO NOT SCALE FROM THIS DRAWING FOLLOW THE FIGURED DIMENSIONS SHOWN.
- DIMENSIONS ARE IN MM UNO
- THIS DRAWING IS CREATED BASED UPON THE 1980's DRAWINGS CONTAINED WITHIN MANCHESTER CENTRAL'S ARCHIVES AND ORIGINAL 1870's DRAWINGS FOR THE CAST IRON BRIDGE OVER GREAT BRIDGEWATER STREET. THE ARCHIVE DRAWINGS ARE INCOMPLETE AND/OR OF POOR QUALITY. THE EXISTING INFORMATION SHOWN ON THESE DRAWINGS SHOULD THEREFORE BE CONSIDERED AS INDICATIVE. IT HAS BEEN PROVIDED TO GIVE AN UNDERSTANDING OF THE LIKELY CONSTRUCTION AND DETAILS THAT MAY BE ENCOUNTERED. DIMENSIONS AND LEVELS MARKED WITH "" ARE INFORMED BY ARCHIVE INFORMATION AND SHOULD BE CONSIDERED AS ESTIMATES ONLY. WHERE EXISTING DETAILS ARE CRITICAL TO NEW INTERFACES THESE SHOULD BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORKS, SO THAT ANY ANOMALIES BETWEEN THE ARCHIVE DRAWINGS AND AS-BUILT STRUCTURE/SUBSEQUENT ALTERATIONS OR ADDITIONS CAN BE IDENTIFIED AND ADDRESSED
- ALL CONCRETE WORKS TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL STRUCTURAL CONCRETE SPECIFICATION AND THE RENAISSANCE CONCRETE SPECIFICATION
- CONCRETE TO BE RC35/45 UNO
- WHERE FEASIBLE EXISTING GOOD QUALITY MASONRY UNITS ARE TO BE SALVAGED AND CLEANED FOR REUSE WITHIN THE WORKS SUBJECT TO AGREEMENT WITH THE ARCHITECT AND CONSERVATION ARCHITECT
- WHERE NEW BRICKS ARE REQUIRED THAT ARE NOT EXPOSED IN THE FINISHED WORKS, THESE ARE TO BE SOLID (CLASS B) ENGINEERING BRICKS. ALL EXPOSED MASONRY TO BE SUITABLY SOURCED TO MATCH EXISTING.
- NEW MASONRY WALLS TO HAVE VERTICAL MOVEMENT JOINTS AT MAXIMUM 12m CENTRES ON STRAIGHT LENGTHS AND WITHIN 6m OF CORNERS. FINAL LOCATIONS TO ARCHITECTS DETAILS
- NO CEMENT BASED MORTAR IS PERMITTED FOR USE WITHIN REINSTATEMENT WORKS OF MASONRY. ALL NEW AND REPAIR WORKS UNDERTAKEN ARE TO BE WITH A LIME MORTAR:
HLM 3.5 - GENERAL MASONRY WORKS 150mm ABOVE GROUND LEVEL
HLM 5.0 - WORKS BELOW GROUND
- ALL TEMPORARY WORKS TO CONTRACTORS DESIGN AND DETAIL.

CDM RISKS

IN ADDITION TO THE TYPICAL RISKS ASSOCIATED WITH WORKS OF THIS NATURE, THE FOLLOWING SPECIFIC RISKS APPLY.

-  RISK OF UNDERMINING EXISTING STRUCTURE DURING WORKS. SAFETY RISK IMPOSED BY POTENTIAL COLLAPSE. MASS CONCRETE UNDERPINNING TO BE COMPLETED IN MAXIMUM 1m WIDE PINS CONSTRUCTED IN HIT AND MISS SEQUENCE TO AVOID WEAKENING THE STRUCTURE ABOVE.
-  LOADING AND VEHICULAR RESTRICTIONS REQUIRED DURING CONSTRUCTION AND BACKFILLING WORKS
-  TEMPORARY WORKS REQUIRED FOR EXCAVATIONS CLOSE TO ACTIVE ROAD, ACCOMODATING HGV TRAFFIC. DESIGN AND DETAILS TO TEMPORARY WORKS ENGINEER'S DESIGN AND SPECIFICATION

WATERPROOFING
ALLOW FOR ALL THE NEW RC STRUCTURE TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING TO MAINTAIN CONTINUITY OF THE EXISTING ASPHALT WATERPROOFING OVER THE ARCHES.
ALL WATERPROOFING, INCLUDING LAPPING TO EXISTING ASPHALT IS TO BE TO SPECIALIST MANUFACTURERS DESIGN AND DETAILS. IT IS RECOMMENDED THAT A WATERPROOFING SPECIALIST IS APPOINTED TO ALLOW CO-ORDINATION OF THE WATERPROOFING WITH THE PROPOSED STRUCTURAL WORKS.

C01	STAGE 5	19.08.21	GR	RW
Rev:	Description:	Date:	By:	Chkd:
 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project:				

VIADUCT,
MANCHESTER

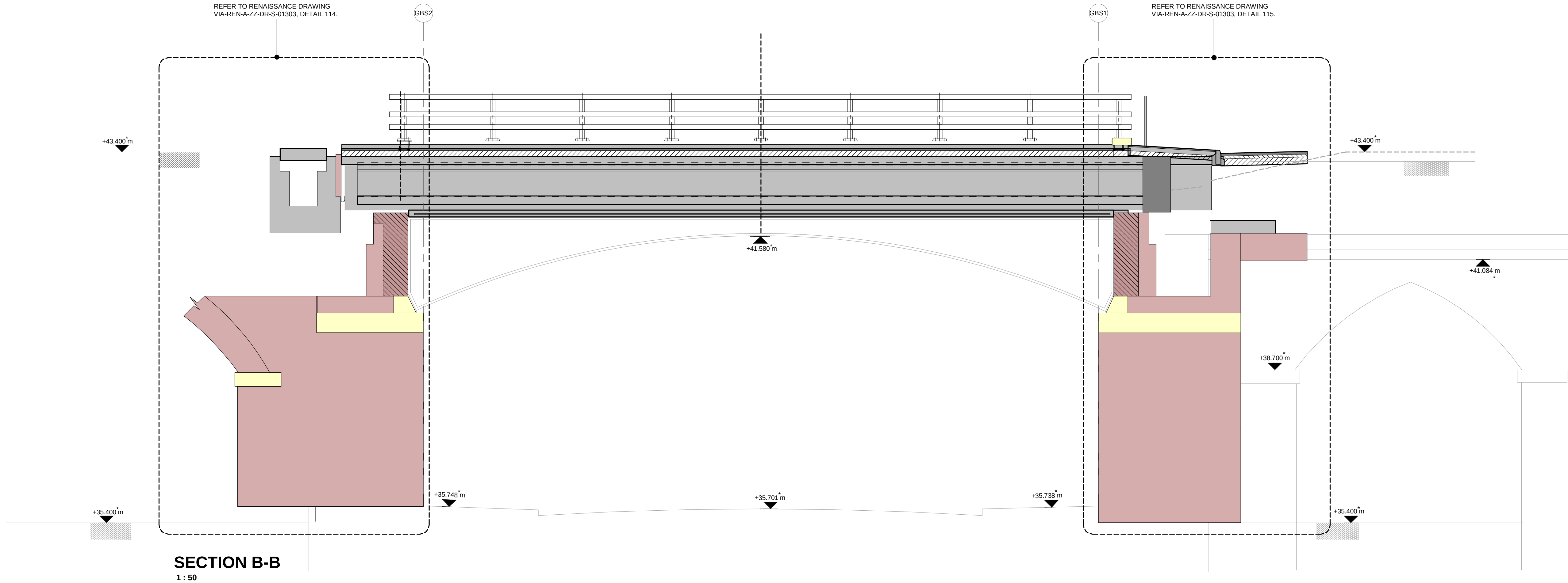
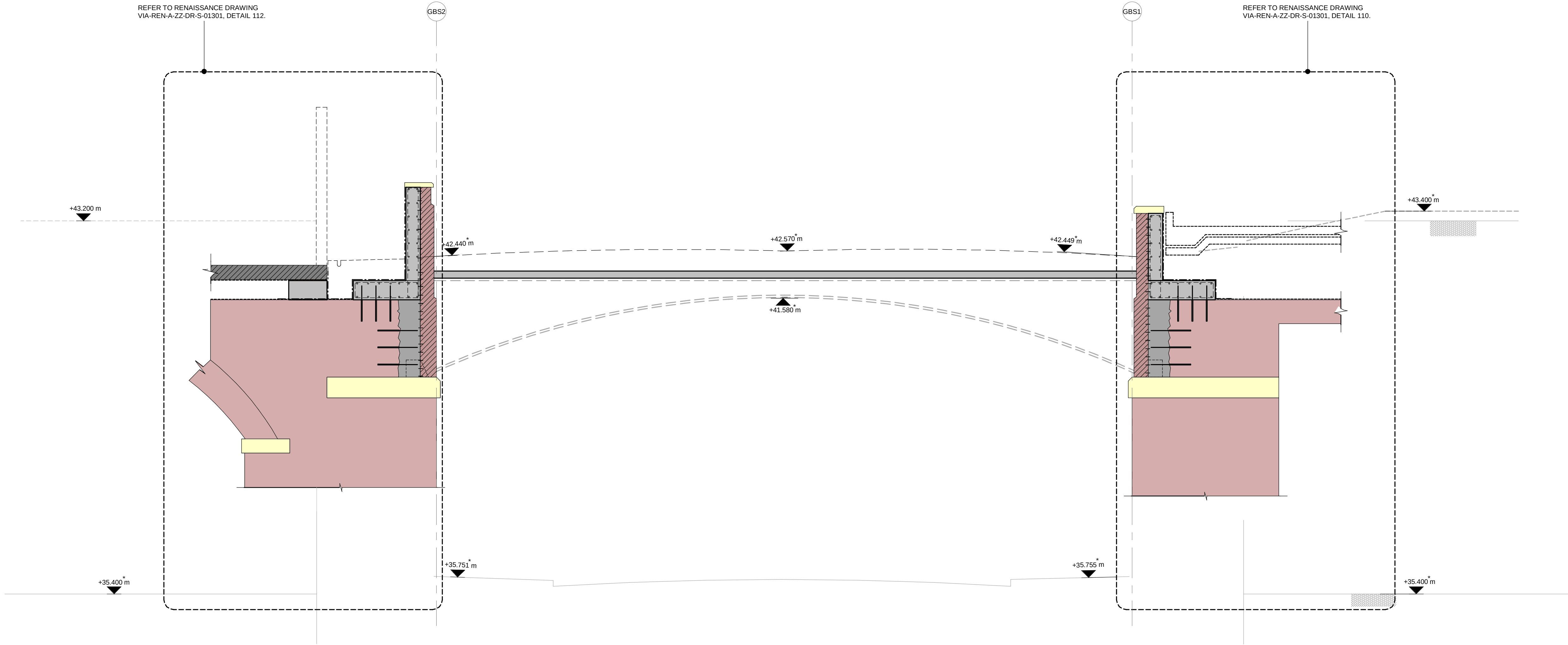
Drawing Title:
**PROPOSED GBS BRIDGE
PLAN (SHEET 1)**

Status:

STAGE 5

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	AUG'21	MR	RW	GR
Scale:	1 : 100	Project No:	1910-12	
Project:	Originator:	Volume:	Level:	Type:
				Role: Category/Number: Rev:

VIA-REN-A-ZZ-DR-S-01100-C01



NOTES:

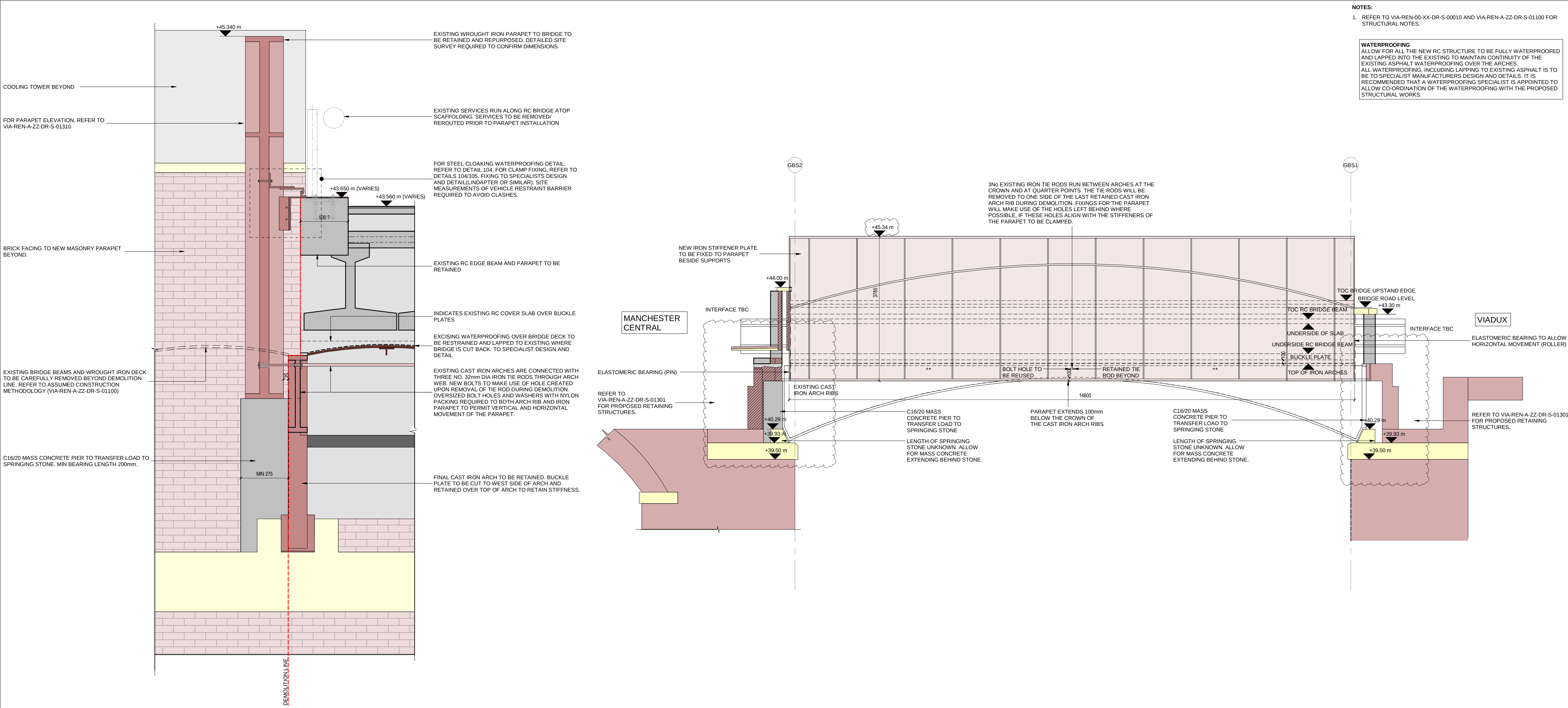
1. REFER TO VIA-REN-00-XX-DR-S-00010 AND VIA-REN-A-ZZ-DR-S-01100 FOR STRUCTURAL NOTES.

WATERPROOFING

ALLOW FOR ALL THE NEW RC STRUCTURE TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING TO MAINTAIN CONTINUITY OF THE EXISTING ASPHALT WATERPROOFING OVER THE ARCHES. ALL WATERPROOFING, INCLUDING LAPPING TO EXISTING ASPHALT IS TO BE TO SPECIALIST MANUFACTURERS DESIGN AND DETAILS. IT IS RECOMMENDED THAT A WATERPROOFING SPECIALIST IS APPOINTED TO ALLOW CO-ORDINATION OF THE WATERPROOFING WITH THE PROPOSED STRUCTURAL WORKS.

STAGE 5		19.08.21	GR	RW
rev:	Description:	Date:	By:	Chkd:
		Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG		
Project: VIADUCT, MANCHESTER				
Drawing Title: <i>PROPOSED GBS BRIDGE SECTIONS</i>				
Status: STAGE 5				
Size: A1	Date: AUG'21	Drawn by: MR	Designed by: RW	Checked by: PC
Scale: 1 : 50	Project No: 1910-12			

VIA-REN-A-ZZ-DR-S-01250-C01



NOTES:
1. REFER TO VIA-REN-00-XX-DR-S-00010 AND VIA-REN-A-ZZ-DR-S-01100 FOR STRUCTURAL NOTES.

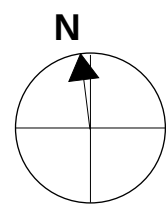
WATERPROOFING
ALLOW FOR ALL THE NEW RC STRUCTURE TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING TO MAINTAIN CONTINUITY OF THE EXISTING ASPHALT WATERPROOFING OVER THE ARCHES. ALL WATERPROOFING, INCLUDING LAPPING TO EXISTING ASPHALT IS TO BE TO SPECIALIST MANUFACTURERS DESIGN AND DETAILS. IT IS RECOMMENDED THAT A WATERPROOFING SPECIALIST IS APPOINTED TO ALLOW CO-ORDINATION OF THE WATERPROOFING WITH THE PROPOSED STRUCTURAL WORKS.

C01	STAGE 5	19.08.21	GR	RW
Rev:	Description:	Date:	By:	Chkd:
renaissance Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project: VIADUCT, MANCHESTER				
Drawing Title: PROPOSED GBS BRIDGE DETAILS - SHEET 1				
Status: STAGE 5				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	AUG'21	MR	RW	PC
Scale:	As indicated	Project No:	1910-12	
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			Role:	Category/Number:
				Rev:

VIA-REN-A-ZZ-DR-S-01300-C01



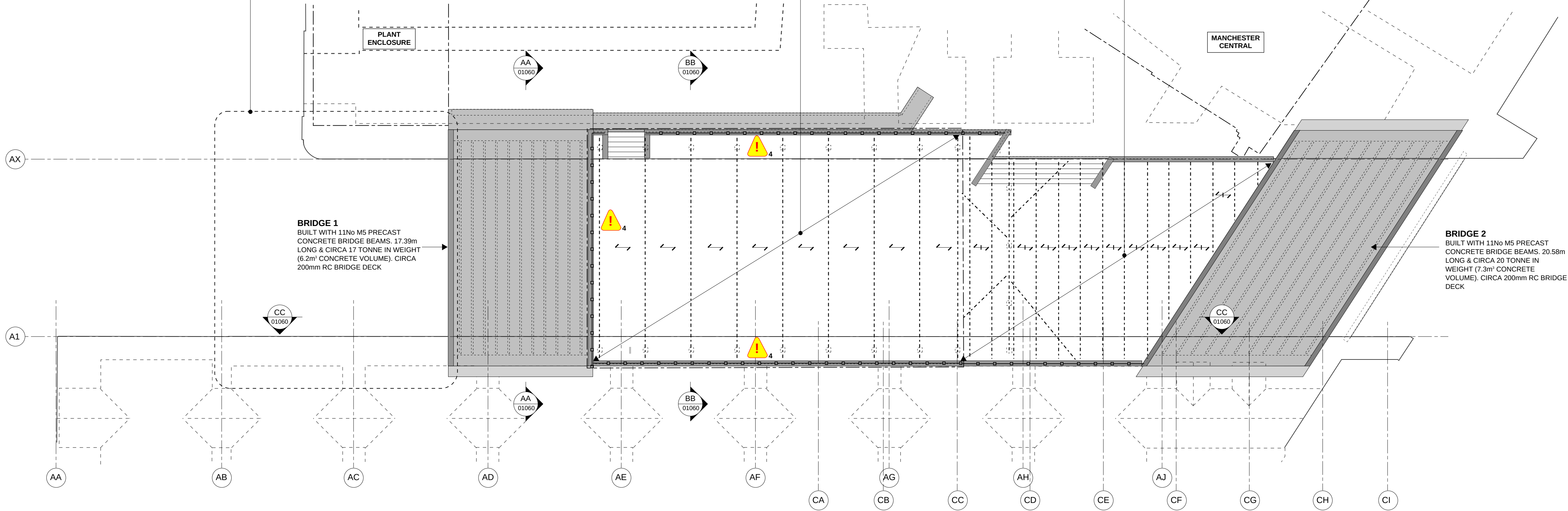
DETAIL 112
PHASE 1 BRIDGE EDGE: MANCHESTER CENTRAL
 1 : 20



FOR PHASE 1 BRIDGE REMOVAL WORKS
AND PARAPET REATTACHMENT DETAILS
REFER TO REN DRAWING
VIA-REN-A-ZZ-DR-S-01100

EXISTING 150mm COMPOSITE SLAB ON
533x210UB COMPOSITE BEAM. REFER
TO CCS ARCHIVE DRAWINGS FOR
DETAILS

EXISTING STEEL GRATED DECK
WITH 2.5kN/m² LOAD CAPACITY.
SUPPORT FRAME UNKNOWN AND
TO BE SURVEYED BY CONTRACTOR



EXISTING BRIDGE UPPER LEVEL PLAN
1:200

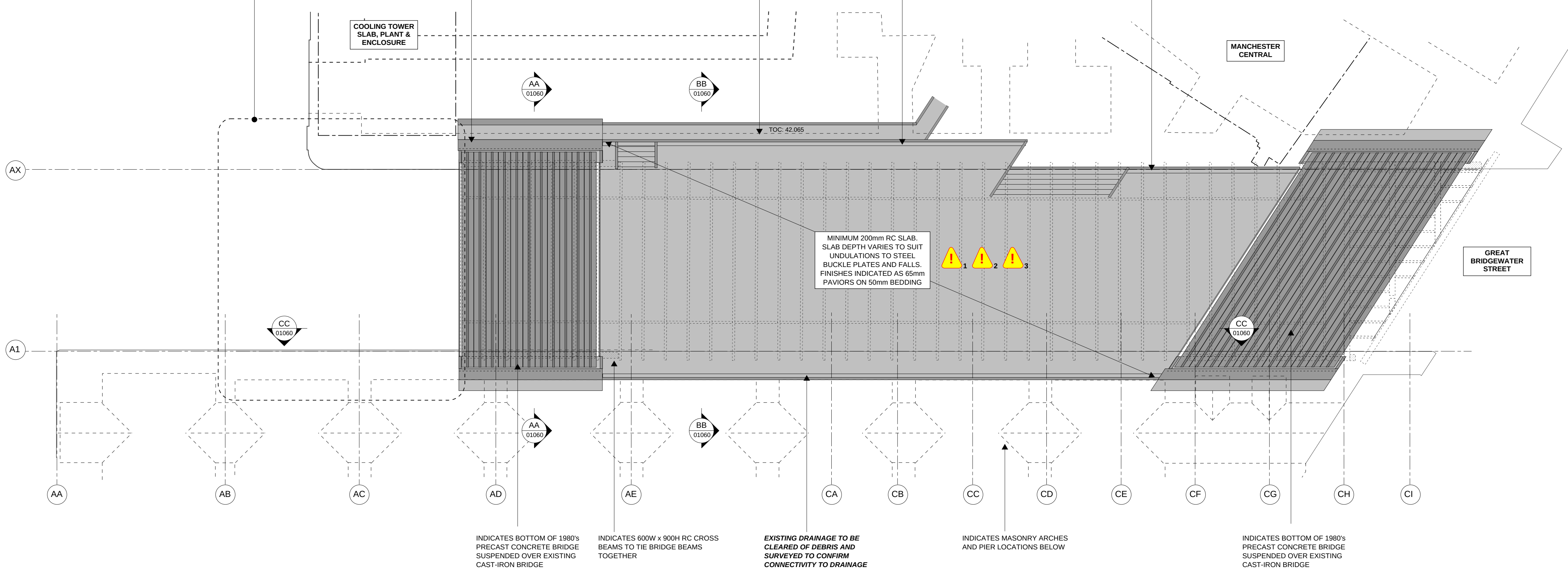
FOR PHASE 1 BRIDGE REMOVAL WORKS
AND PARAPET REATTACHMENT DETAILS
REFER TO REN DRAWING
VIA-REN-A-ZZ-DR-S-01100

RC ABUTMENT DETAILS AND
DIAPHRAGM BEAMS TYING
PRECAST BRIDGE BEAMS
TOGETHER TBC

1200W x 800H RC
TRENCH FOR COOLING
TOWER DUCTWORK

EXISTING DRAINAGE TO BE
CLEARED OF DEBRIS AND
SURVEYED TO CONFIRM
CONNECTIVITY TO DRAINAGE
NETWORK

EXISTING DRAINAGE TO BE
CLEARED OF DEBRIS AND
SURVEYED TO CONFIRM
CONNECTIVITY TO DRAINAGE
NETWORK



EXISTING BRIDGE LOWER LEVEL PLAN
1:200

NOTES:

- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
- THE DRAWINGS SHOWING THE EXISTING STRUCTURE ARE BASED UPON THE 1980'S DRAWINGS CONTAINED WITHIN MANCHESTER CENTRALS ARCHIVES AND ORIGINAL 1970'S DRAWINGS FOR THE CAST-IRON BRIDGE OVER GREAT BRIDGEWATER STREET. THE ARCHIVE DRAWINGS ARE INCOMPLETE OR OF POOR QUALITY. THE INFORMATION SHOWN ON THESE DRAWINGS SHOULD THEREFORE BE CONSIDERED AS INDICATIVE AND PROVIDED TO GIVE AN UNDERSTANDING OF THE LIKELY CONSTRUCTION AND DETAILS THAT MAY BE ENCOUNTERED. WHERE EXISTING DETAILS ARE CRITICAL TO THE DEMOLITION WORKS OR DETAILING OF NEW INTERFACES THESE SHOULD BE VERIFIED ON SITE PRIOR TO COMMENCEMENT OF DEMOLITION AND CONSTRUCTION WORKS SO THAT ANY ANOMALIES BETWEEN THE ARCHIVE DRAWINGS AND AS-BUILT STRUCTURE OR SUBSEQUENT ALTERATIONS OR ADDITIONS CAN BE ADDRESSED.

HEALTH & SAFETY NOTES:

IN ADDITION TO THE NORMAL RISKS, A COMPETENT CONTRACTOR EXPERIENCED IN THIS TYPE OF WORK WOULD BE EXPECTED TO BE AWARE OF, THE FOLLOWING ABNORMAL AND RESIDUAL RISKS FROM THE DESIGN SHOULD BE NOTED AND MANAGED BY THE CONTRACTOR.

- THE LOAD CAPACITY OF EXISTING CAST-IRON BRIDGE IS UNKNOWN AND ANECDOTAL EVIDENCE INDICATES IT HAS FRACTURES, WHICH WILL LIMIT ITS LOAD CAPACITY. ALL WORKS UNDERTAKEN TO OR OVER THE EXISTING BRIDGE NEED TO TAKE CONSIDERATION OF THIS (I.E. PLANT LIMITED TO LIGHTWEIGHT MACHINERY, NO STOCKPILING OF MATERIALS ETC.). ARCHIVE DRAWINGS INDICATE A MAXIMUM IMPOSED LOAD ALLOWANCE OF 2.5kN/m².
- THE EXISTING BRIDGE IS OF CAST-IRON CONSTRUCTION WHICH IS BRITTLE. THE USE OF PERCUSSIVE TECHNIQUES ON OR IN CLOSE PROXIMITY TO THE CAST-IRON ARCHES SHOULD BE USED WITH EXTREME CAUTION AND SUBJECT TO ASSESSMENT BY THE CONTRACTORS TEMPORARY WORKS ENGINEER.
- THE EXISTING BRIDGE IS AN ARCH AND RELIES ON BALANCED LOADING FOR ITS STABILITY. ALL CONSTRUCTION AND DEMOLITION WORKS NEED TO BE PHASED TO MINIMISE OUT OF BALANCE LOADING AND AN ASSESSMENT UNDERTAKEN BY THE CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER.
- THE EXISTING BRIDGE PARAPET RC EDGE AND STEEL BARRIER CONDITION IS UNKNOWN. PRIOR TO DEMOLITION OF THE CAST IRON BRIDGE BELOW THE CONTRACTOR IS TO UNDERTAKE A DETAILED CONDITION SURVEY OF THE BRIDGE EDGE & EXISTING PARAPET SAFETY BARRIER, DESIGN AND PROCURE ANY NEW BARRIERS AND FIXINGS REQUIRED, AND INSTALL. REMOVAL OF THE EXISTING CAST-IRON BRIDGE PRIOR TO INSTALLATION/REPAIR OF A SUITABLE SAFETY BARRIER TO THE BRIDGE EDGE IS NOT PERMITTED WITHOUT TEMPORARY MEASURES TO PREVENT THE RISK OF VEHICLES DRIVING OFF THE EDGE OF THE VIADUCT.

DEMOLITION WORKS

THE DEMOLITION CONTRACTOR SHOULD READ THESE DRAWINGS IN CONJUNCTION WITH THE FOLLOWING ARCHIVE INFORMATION:

- CAST IRON RIB & BUCKLE PLATE DRAWINGS (CIRCA 1875)
- RC OVERSLAB DETAILS & RC DETAIL DRAWINGS (CIRCA 1984)
- CONSTRUCTION PHOTOGRAPHS (CIRCA 1985-1986)
- INFILL FLOOR (CCS 2013)
- DRAWINGS TOPGRAPHICAL (SURVEY SYSTEMS 2016)

THE INFORMATION PROVIDED ABOVE AND ON THESE DRAWINGS IS INCOMPLETE, BASED ON LIMITED RECORD INFORMATION AND COMES WITH NO RELIANCE. THE DEMOLITION CONTRACTOR IS THEREFORE TO UNDERTAKE THEIR OWN DETAILED SURVEYS TO CONFIRM THE EXISTING CONSTRUCTION, EXISTING DETAILS AND TEMPORARY LOADING CONSTRAINTS TO ALLOW THEM TO DEVELOP THEIR DEMOLITION STRATEGY, DETAILED RISK ASSESSMENTS AND METHOD STATEMENTS.

DETAILS - SURVEYS

THE INFORMATION ON THIS DRAWINGS IS INDICATIVE ONLY TO ALLOW FOR STAGE 3 COSTING AND TO CONVEY KNOWN INFORMATION TO THE DEMOLITION CONTRACTOR. FOR THE REMEDIAL WORKS THE DETAILS SHOWN ARE INDICATIVE AND ARE TO BE FINALISED AT RIBA STAGE 4/5 FOLLOWING RECEIPT OF DETAILED SURVEY INFORMATION FROM THE CONTRACTOR FOR THE AREAS IDENTIFIED ON THESE DRAWINGS.

LOWER BRIDGE DECK DRAINAGE

EXISTING RAINWATER OUTLETS TO LOWER BRIDGE LEVEL TO BE CONFIRMED BY CONTRACTOR FOLLOWING REMOVAL OF GRILL. ALLOW FOR DRAINAGE SURVEY AND POTENTIAL ALTERATIONS TO EXISTING DRAINAGE

RIBA STAGE 3

ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

Rev:	Description:	Date:	By:	Chkd:
P01	STAGE 3	09.11.21	GR	KG



VIADUX PHASE II, MANCHESTER

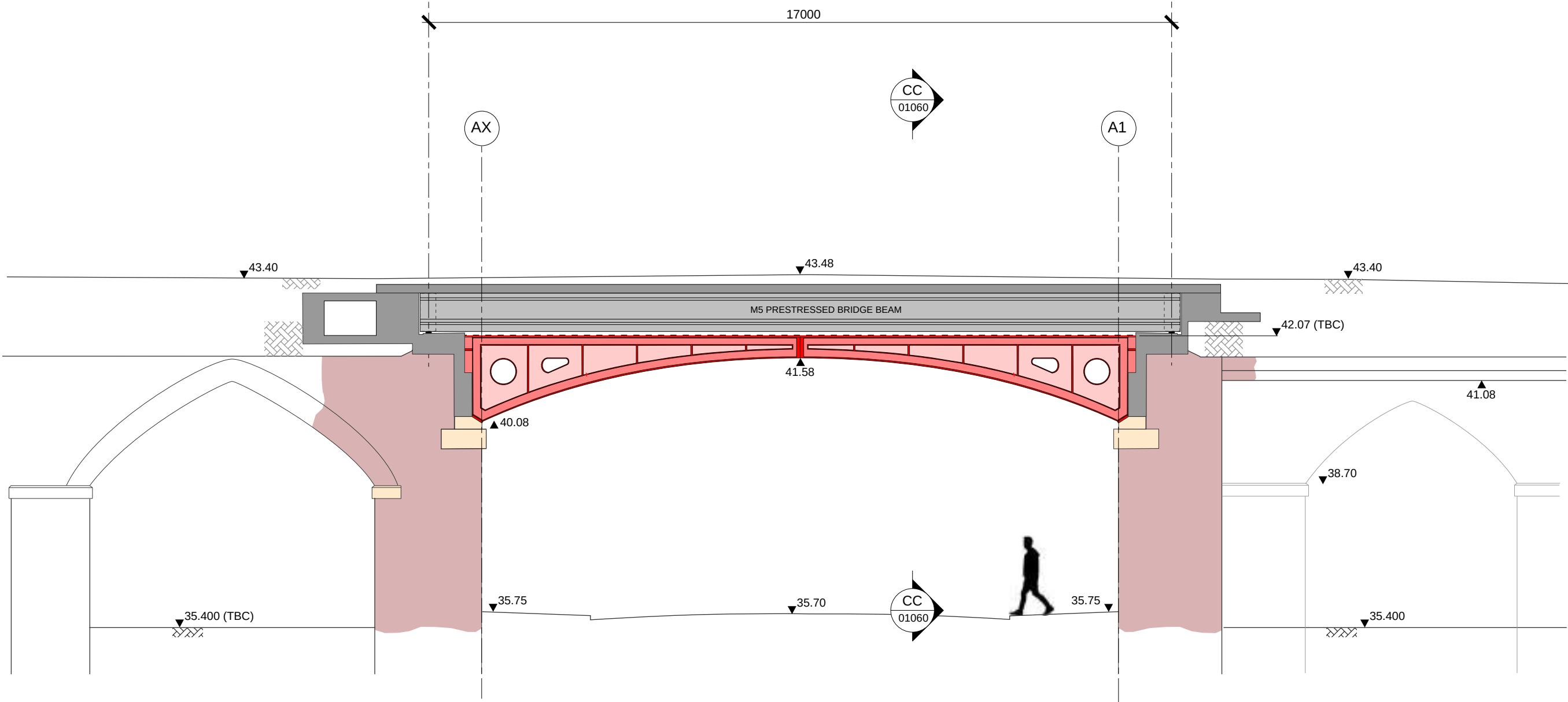
GBS BRIDGE EXISTING PLANS

Status: RIBA STAGE 3

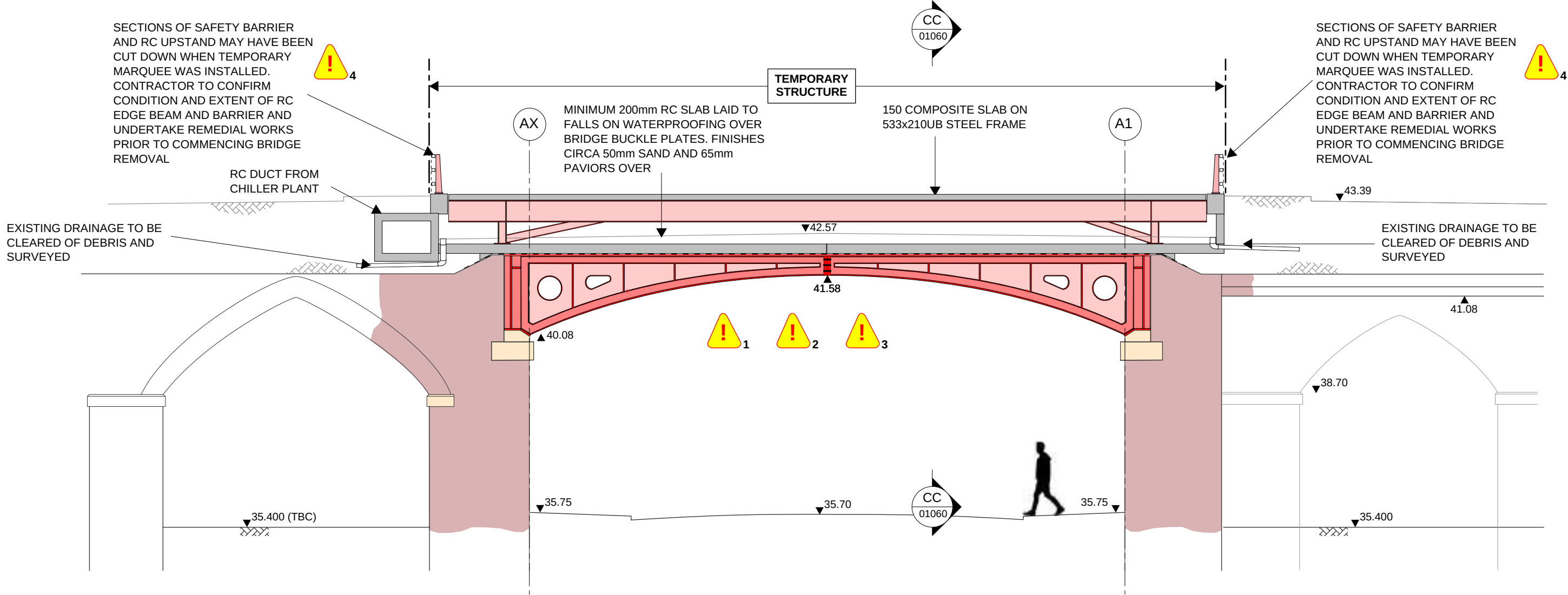
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A1	09.11.21	GR	GR	KG

Scale:	Project:	Originator:	Volume:	Level:	Type:	Rate:	Category/Number:	Rev:
1:200	2102-09							

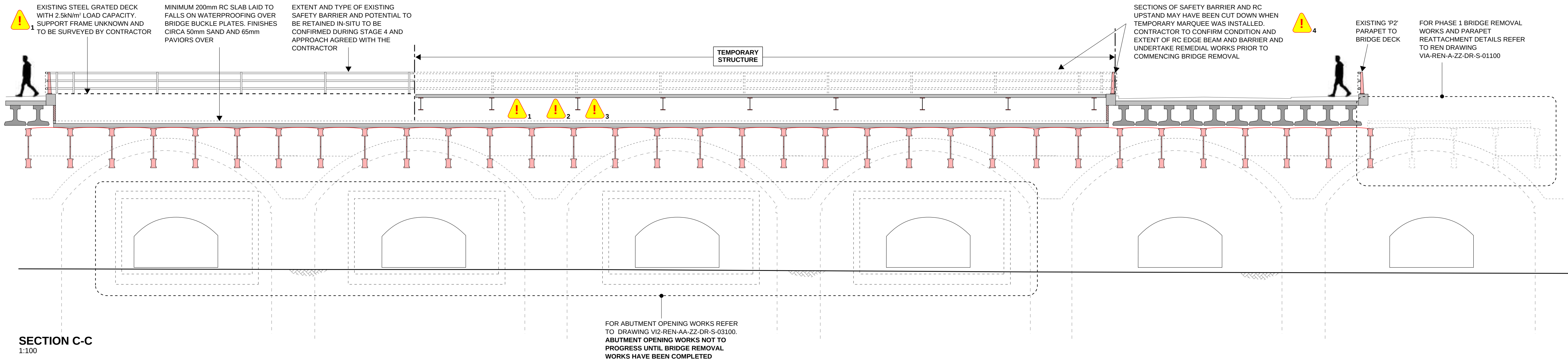
VI2-REN-AA-ZZ-DR-S-01050-P01



SECTION A-A
1:100



SECTION B-B
1:100



SECTION C-C
1:100



PHOTOGRAPH SHOWING BRIDGE 1 PRECAST CONCRETE INSTALLATION AND WATERPROOFING OF BUCKLE PLATES OVER CAST-IRON ARCHES
CIRCA 1985



PHOTOGRAPH SHOWING COMPLETED BRIDGE 1, CONCRETE SLAB TO CAST-IRON ARCHES AND RC VENT DUCTS
CIRCA 1985

NOTES:

1. REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
2. FOR ADDITIONAL NOTES REFER TO DRAWING V12-REN-AA-ZZ-DR-S-01050.

HEALTH & SAFETY NOTES:

IN ADDITION TO THE NORMAL RISKS, A COMPETENT CONTRACTOR EXPERIENCED IN THIS TYPE OF WORK WOULD BE EXPECTED TO BE AWARE OF. THE FOLLOWING ABNORMAL AND RESIDUAL RISKS FROM THE DESIGN SHOULD BE NOTED AND MANAGED BY THE CONTRACTOR.



THE LOAD CAPACITY OF EXISTING CAST-IRON BRIDGE IS UNKNOWN AND ANECDOTAL EVIDENCE INDICATES IT HAS FRACTURES, WHICH WILL LIMIT ITS LOAD CAPACITY. ALL WORKS UNDERTAKEN TO OR OVER THE EXISTING BRIDGE NEED TO TAKE CONSIDERATION OF THIS (I.E. PLANT LIMITED TO LIGHTWEIGHT MACHINERY, NO STOCKPILING OF MATERIALS ETC.). ARCHIVE DRAWINGS INDICATE A MAXIMUM IMPOSED LOAD ALLOWANCE OF 2.5kN/m².



THE EXISTING BRIDGE IS OF CAST-IRON CONSTRUCTION WHICH IS BRITTLE. THE USE OF PERCUSSIVE TECHNIQUES ON OR IN CLOSE PROXIMITY TO THE CAST-IRON ARCHES SHOULD BE USED WITH EXTREME CAUTION AND SUBJECT TO ASSESSMENT BY THE CONTRACTORS TEMPORARY WORKS ENGINEER.

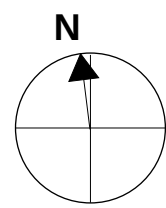


THE EXISTING BRIDGE IS AN ARCH AND RELIES ON BALANCED LOADING FOR ITS STABILITY. ALL CONSTRUCTION AND DEMOLITION WORKS NEED TO BE PHASED TO MINIMISE OUT OF BALANCE LOADINGS AND AN ASSESSMENT UNDERTAKEN BY THE CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER.



THE EXISTING BRIDGE PARAPET RC EDGE AND STEEL BARRIER CONDITION IS UNKNOWN. PRIOR TO DEMOLITION OF THE CAST IRON BRIDGE BELOW THE CONTRACTOR IS TO UNDERTAKE A DETAILED CONDITION SURVEY OF THE BRIDGE EDGE & EXISTING PARAPET SAFETY BARRIER. DESIGN AND PROCURE ANY NEW BARRIERS AND FIXINGS REQUIRED, AND INSTALL. REMOVAL OF THE EXISTING CAST-IRON BRIDGE PRIOR TO INSTALLATION/REPAIR OF A SUITABLE SAFETY BARRIER TO THE BRIDGE EDGE IS NOT PERMITTED.

P01	STAGE 3	09.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:
 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project: VIADUX PHASE II, MANCHESTER				
Drawing Title: GBS BRIDGE EXISTING SECTIONS				
Status: RIBA STAGE 3				
Size: A1	Date: 09.11.21	Drawn by: GR	Designed by: GR	Checked by: KG
Scale: 1:100	Project No: 2102-09			
Project:	Originator:	Volume:	Level:	Type: Role: Category/Number: Rev:
V12-REN-AA-ZZ-DR-S-01060-P01				



FOR PHASE 1 BRIDGE REMOVAL WORKS AND PARAPET REATTACHMENT DETAILS REFER TO REN DRAWING VIA-REN-A-ZZ-DR-S-01100

EXTENT OF EXISTING SAFETY BARRIER TBC BY CONTRACTOR. CONTRACTOR TO CONFIRM CONDITION AND EXTENT OF RC EDGE BEAM AND BARRIER AND UNDERTAKE REMEDIAL/INSTALLATION OF NEW BARRIER PRIOR TO COMMENCING BRIDGE REMOVAL

NEW FOOTPATH ON MOT TYPE 1 FILL WELL COMPACTED IN MAXIMUM 150mm LAYERS AND LAID TO FALL TO DISCHARGE SURFACE WATER TO ADJACENT FOOTPATH AND GULLIES

INDICATES NEW RC WALL TO EDGE OF EXISTING ABUTMENT.ALLOW FOR CASTING IN MAXIMUM 8.5m LENGTHS WITH DOWELLED 20mm MOVEMENT JOINTS

MANCHESTER CENTRAL CONFERENCE CENTER ASSUMED TO CONTINUE TO MANAGE GRATED AREA TO ENSURE NO VEHICLE ACCESS

MANCHESTER CENTRAL

ALLOW FOR HIGH CONTAINMENT KERB AND NEW 'H2-W2' CONTAINMENT PARAPET (TBC AT STAGE 4) TO EDGE OF EXISTING BRIDGE. EXISTING PARAPET CONNECTIONS TO BE INSPECTED BY BARRIER SUPPLIER TO ASSESS SUITABILITY FOR REUSE

INDICATES MASONRY ARCHES AND PIER LOCATIONS BELOW

BUILDING B RESIDENTIAL

BUILDING D PODIUM

BUILDING C OFFICE

INDICATES LINE OF HIGH CONTAINMENT KERB AND NEW 'H2-W4' CONTAINMENT PARAPET (TBC AT STAGE 4) TO PROVIDE VEHICLE PROTECTION TO EDGE OF BRIDGE/VIA DUCT AND TO BE INSTALLED PRIOR TO REMOVAL OF EXISTING P3 BARRIER

PROPOSED BRIDGE UPPER LEVEL PLAN

1:200

FOR PHASE 1 BRIDGE REMOVAL WORKS AND PARAPET REATTACHMENT DETAILS REFER TO REN DRAWING VIA-REN-A-ZZ-DR-S-01100

COOLING TOWER SLAB, PLANT & ENCLOSURE

INDICATES NEW RC WALL TO EDGE OF EXISTING ABUTMENT IN MAXIMUM 8.5m LENGTHS WITH DOWELLED 20mm MOVEMENT JOINTS BETWEEN

NEW RC SLAB AND UPSTAND CAST ONTO EXISTING BRIDGE DECK AND TIED INTO EXISTING OVERSLAB. UPSTAND SUPPORTS NEW STEEL FRAME

MASS CONCRETE RC STAIRS CAREFULLY CUT BACK TO ALLOW FOR CONSTRUCTION OF NEW EDGE SLAB AND 200 THICK RC WALL CONSTRUCTED

EXISTING DRAINAGE CHANNEL TO BE CLEANED AND SURVEYED BY CONTRACTOR. ALLOW FOR INSTALLATION OF NEW GULLIES AND CONNECTION TO EXISTING SURFACE WATER NETWORK

MANCHESTER CENTRAL

GREAT BRIDGEWATER STREET

INDICATES EXTENT OF BRIDGE TO BE REMOVED BETWEEN BRICKWORK ABUTMENTS.

GREAT BRIDGEWATER STREET

INDICATES MASONRY ARCHES AND PIER LOCATIONS BELOW

NEW LIGHTWEIGHT STEEL FRAME FIXED TO EXISTING PRECAST CONCRETE BRIDGE TO SUPPORT CLADDING TO ARCHITECT'S DETAILS

INDICATES NEW RC WALL AND RC FOOTING ABOVE TO EDGE OF EXISTING ABUTMENT IN MAXIMUM 8.5m LENGTHS WITH DOWELLED 20mm MOVEMENT JOINTS BETWEEN

NEW LIGHTWEIGHT STEEL FRAME FIXED TO NEW STEEL FRAME. CLADDING TO ARCHITECT'S DETAILS

INDICATES NEW RC BASE BUILT OFF EXISTING RC OVERSLAB

EXISTING DRAINAGE CHANNEL TO BE CLEANED AND SURVEYED BY CONTRACTOR. ALLOW FOR INSTALLATION OF NEW GULLIES AND CONNECTION TO EXISTING SURFACE WATER NETWORK

PROPOSED BRIDGE LOWER LEVEL PLAN

1:200

HEALTH & SAFETY NOTES:

IN ADDITION TO THE NORMAL RISKS, A COMPETENT CONTRACTOR EXPERIENCED IN THIS TYPE OF WORK WOULD BE EXPECTED TO BE AWARE OF, THE FOLLOWING ABNORMAL AND RESIDUAL RISKS FROM THE DESIGN SHOULD BE NOTED AND MANAGED BY THE CONTRACTOR.



1 THE LOAD CAPACITY OF EXISTING CAST-IRON BRIDGE IS UNKNOWN AND ANECDOTAL EVIDENCE INDICATES IT HAS FRACTURES, WHICH WILL LIMIT ITS LOAD CAPACITY. ALL WORKS UNDERTAKEN TO OR OVER THE EXISTING BRIDGE NEED TO TAKE CONSIDERATION OF THIS (I.E. PLANT LIMITED TO LIGHTWEIGHT MACHINERY, NO STOCKPILING OF MATERIALS ETC.). ARCHIVE DRAWINGS INDICATE A MAXIMUM IMPOSED LOAD ALLOWANCE OF 2.5kN/m².



2 THE EXISTING BRIDGE IS OF CAST-IRON CONSTRUCTION WHICH IS BRITTLE. THE USE OF PERCUSSIVE TECHNIQUES ON OR IN CLOSE PROXIMITY TO THE CAST-IRON ARCHES SHOULD BE USED WITH EXTREME CAUTION AND SUBJECT TO ASSESSMENT BY THE CONTRACTORS TEMPORARY WORKS ENGINEER.



3 THE EXISTING BRIDGE IS AN ARCH AND RELIES ON BALANCED LOADING FOR ITS STABILITY. ALL CONSTRUCTION AND DEMOLITION WORKS NEED TO BE PHASED TO MINIMISE OUT OF BALANCE LOADING AND AN ASSESSMENT UNDERTAKEN BY THE CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER.



4 THE EXISTING BRIDGE PARAPET RC EDGE AND STEEL BARRIER CONDITION IS UNKNOWN. PRIOR TO DEMOLITION OF THE CAST IRON BRIDGE BELOW THE CONTRACTOR IS TO UNDERTAKE A DETAILED CONDITION SURVEY OF THE BRIDGE EDGE & EXISTING PARAPET SAFETY BARRIER. DESIGN AND PROCURE ANY NEW BARRIERS AND FIXINGS REQUIRED, AND INSTALL. REMOVAL OF THE EXISTING CAST-IRON BRIDGE PRIOR TO INSTALLATION/REPAIR OF A SUITABLE SAFETY BARRIER TO THE BRIDGE EDGE IS NOT PERMITTED.

KEY

* INDICATES DIMENSIONS AND LEVEL TO BE CONFIRMED ON SITE AND AGREE WITH THE ARCHITECT AND ENGINEER PRIOR TO FABRICATION AND EXECUTION OF THE WORKS

GENERAL NOTES:

- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
- ALL CONCRETE WORKS TO BE EXECUTED IN ACCORDANCE WITH THE LATEST EDITION OF THE 'NATIONAL STRUCTURAL CONCRETE SPECIFICATION' AND RENAISSANCE PROJECT CONCRETE SPECIFICATION.
- ALL STEELWORK TO BE FABRICATED IN ACCORDANCE WITH THE LATEST EDITION OF THE 'NATIONAL STRUCTURAL STEELWORK SPECIFICATION AND RENAISSANCE PROJECT STEELWORK SPECIFICATION.
- ALL STEELWORK TO BE S355 J2 U.N.O. FINAL SUBGRADE IS TO BE CONFIRMED DURING TECHNICAL DESIGN WITH INPUT FROM THE STEELWORK FABRICATOR ONCE THE CONNECTION DETAILS ARE KNOWN.
- CONCRETE TO GENERALLY BE RC35/45 AIR ENTRAINED.
- WHERE FEASIBLE EXISTING GOOD QUALITY MASONRY UNITS ARE TO BE SALVAGED AND CLEANED FOR REUSE WITHIN THE WORKS. THE GLAZED BRICKS TO GREAT BRIDGEWATER STREET ARE TO ALSO BE SALVAGED AND REUSED FOR REINSTATEMENT OF BRICKWORK AROUND THE NEW OPENINGS.
- WHERE NEW BRICKS ARE REQUIRED THAT ARE NOT EXPOSED IN THE FINISHED WORKS THESE ARE TO BE SOLID CLASS B CLAY ENGINEERING BRICKS. ALL EXPOSED MASONRY TO BE SUITABLY SOURCED TO MATCH EXISTING.
- NO CEMENT BASED MORTAR IS PERMITTED FOR USE WITHIN REINSTATEMENT WORKS OF MASONRY. ALLOW FOR NEW AND REPAIR WORKS UNDERTAKEN TO BE WITH A LIME MORTAR:
HLM 3.5 - GENERAL MASONRY WORKS 150mm ABOVE GROUND
HLM 5.0 - WORKS BELOW GROUND
FINAL MORTAR SPECIFICATION TO BE IN ACCORDANCE WITH THE HERITAGE ARCHITECTS SPECIFICATION AND SUBJECT TO AGREEMENT WITH THE ENGINEER.

RIBA STAGE 3

ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

MANCHESTER CENTRAL ARCHES - SURVEYS

SURVEY AND OPENING UP WORKS TO BE UNDERTAKEN TO VERIFY EXISTING CONSTRUCTION. THIS INFORMATION IS REQUIRED TO VERIFY IF THE EXISTING BRIDGE PROVIDES PROPPING TO THE ARCHES.
AT THIS STAGE IT HAS BEEN ASSUMED THAT THE ABUTMENTS ARE ADEQUATE TO RESIST THE ARCH THRUSTS. HOWEVER, A RISK ALLOWANCE SHOULD BE MADE FOR INTRODUCING PERMANENT PROPS BETWEEN BRIDGE ABUTMENTS IF THE ARCHES ARE FOUND TO REQUIRE ADDITIONAL SUPPORT.

GREAT BRIDGEWATER STREET BRIDGE - SURVEYS

SURVEY AND OPENING UP WORKS ARE REQUIRED TO BE UNDERTAKEN TO VERIFY EXISTING CONSTRUCTION DETAILS. THIS INFORMATION IS REQUIRED TO ALLOW THE NEW INTERVENTION WORK DETAILS TO BE DEVELOPED AND TO ASSIST THE CONTRACTOR IN DEVELOPING THEIR DETAILED CONSTRUCTION SEQUENCING AND TO CALCULATE MEMBER WEIGHT FOR DEMOLITION ETC.

WATERPROOFING

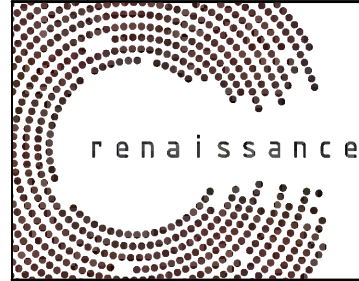
THE NEW RC STRUCTURES ARE TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING WATERPROOFING SYSTEMS TO MAINTAIN CONTINUITY AND PREVENT WATER INGRESS TROUGH THE VIADUCT STRUCTURE AND BRIDGES. ALL WATERPROOFING, INCLUDING LAPPING TO THE EXISTING WATERPROOFING SYSTEMS IS TO BE THE SPECIALIST WATERPROOFING SUPPLIERS DESIGN AND DETAIL. THE CONTRACTOR IS TO APPOINTED A WATERPROOFING SPECIALIST TO CO-ORDINATE AND DETAIL ALL WATERPROOFING WORKS. ALL WATERPROOFING INDICATED ON THESE DRAWINGS IS INDICATIVE ONLY AND THE FINAL LOCATION AND DETAILS ARE TO BE TO THE ARCHITECTS INTENT AND WATERPROOFING SPECIALIST DESIGN.

EXPOSED STEELWORK CORROSION PROTECTION

ALL STRUCTURAL STEELWORK, BRACKETRY AND FIXINGS ASSOCIATED WITH THE ALTERATIONS TO THE EXISTING BRIDGE EDGES AND CLADDING SUPPORT ARE TO HAVE AN IN PROTECTIVE TREATMENT IN ACCORDANCE WITH RT/CE/S/039. SPECIFICATION RT38 - PROTECTIVE TREATMENTS FOR RAILTRACK INFRASTRUCTURE AND RT/CE/C/002: APPLICATION AND REAPPLICATION OF PROTECTIVE TREATMENT TO RAILTRACK INFRASTRUCTURE.

THE STEELWORK FABRICATOR IS TO CONFIRM THE SUPPLIER AND PROVIDE FULL DETAILS OF THE COMPLIANT PAINT PROTECTION SYSTEM FOR THE ENGINEERS REVIEW AND TGM APPROVAL

P01	STAGE 3	09.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:



Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project:

VIADUX PHASE II, MANCHESTER

Drawing Title:

PROPOSED GBS BRIDGE PLANS

Status:

RIBA STAGE 3

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	09.11.21	GR	GR	KG

Scale: 1:200			Project No: 2102-09				
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:

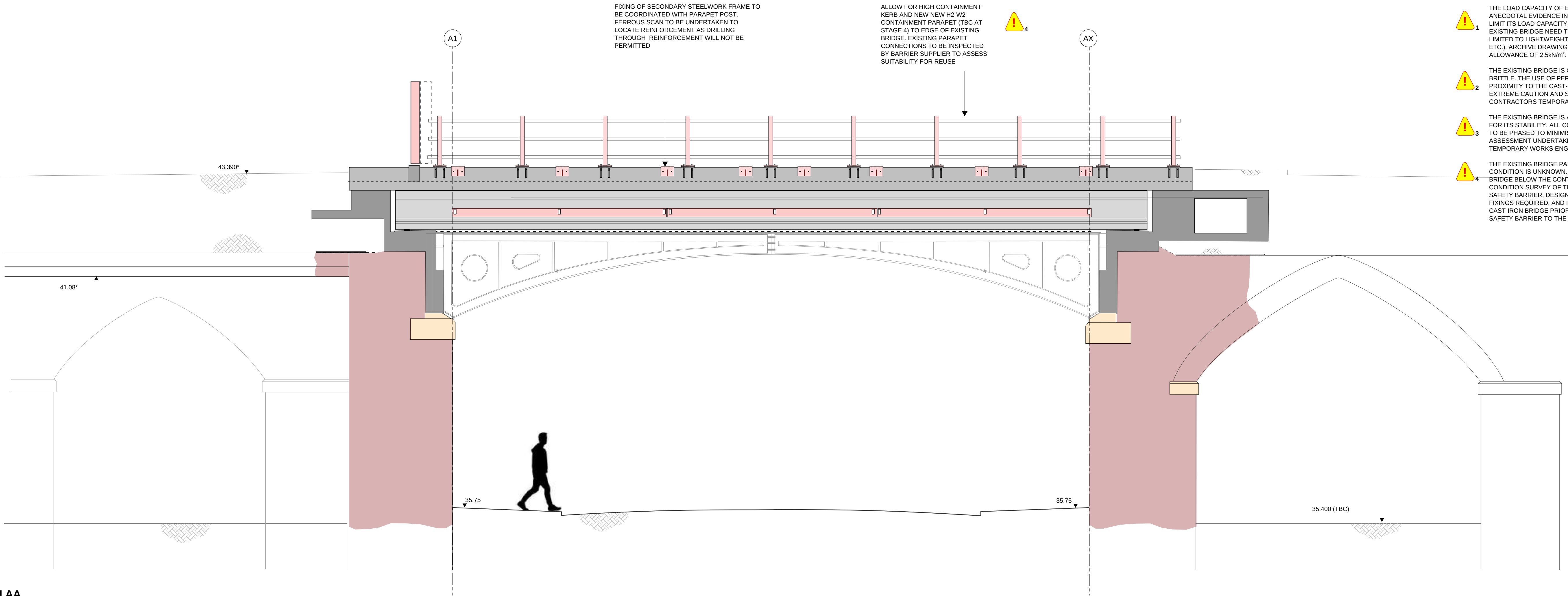
VI2-REN-AA-ZZ-DR-S-01100-P01

- GENERAL NOTES:**
- REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING V12-REN-AA-ZZ-DR-S-01100.

HEALTH & SAFETY NOTES:

IN ADDITION TO THE NORMAL RISKS, A COMPETENT CONTRACTOR EXPERIENCED IN THIS TYPE OF WORK WOULD BE EXPECTED TO BE AWARE OF. THE FOLLOWING ABNORMAL AND RESIDUAL RISKS FROM THE DESIGN SHOULD BE NOTED AND MANAGED BY THE CONTRACTOR.

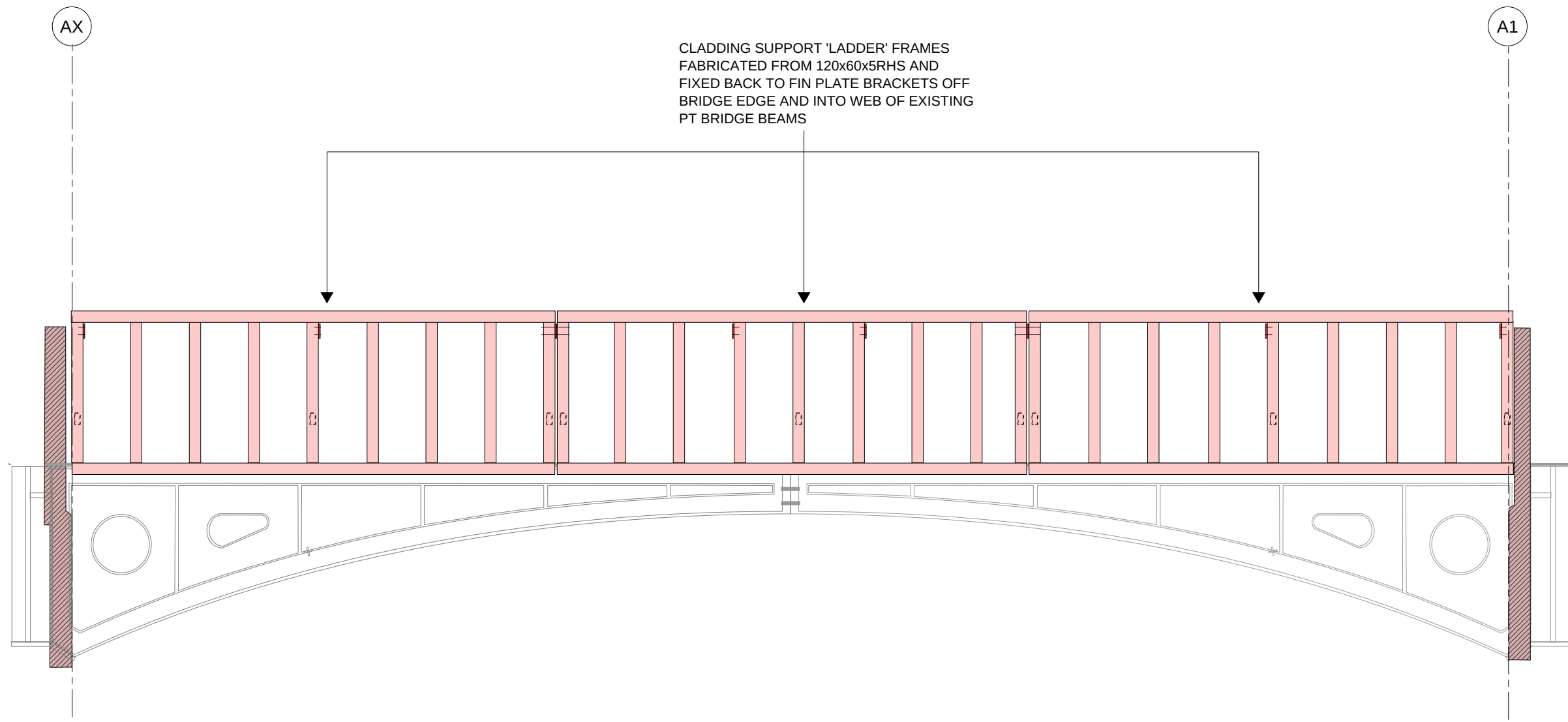
- **1**
- **2**
- **3**
- **4**
- THE LOAD CAPACITY OF EXISTING CAST-IRON BRIDGE IS UNKNOWN AND ANECDOTAL EVIDENCE INDICATES IT HAS FRACTURES, WHICH WILL LIMIT ITS LOAD CAPACITY. ALL WORKS UNDERTAKEN TO OR OVER THE EXISTING BRIDGE NEED TO TAKE CONSIDERATION OF THIS (I.E. PLANT LIMITED TO LIGHTWEIGHT MACHINERY, NO STOCKPILING OF MATERIALS ETC.). ARCHIVE DRAWINGS INDICATE A MAXIMUM IMPOSED LOAD ALLOWANCE OF 2.5kN/m².
- THE EXISTING BRIDGE IS OF CAST-IRON CONSTRUCTION WHICH IS BRITTLE. THE USE OF PERCUSSIVE TECHNIQUES ON OR IN CLOSE PROXIMITY TO THE CAST-IRON ARCHES SHOULD BE USED WITH EXTREME CAUTION AND SUBJECT TO ASSESSMENT BY THE CONTRACTORS TEMPORARY WORKS ENGINEER.
- THE EXISTING BRIDGE IS AN ARCH AND RELIES ON BALANCED LOADING FOR ITS STABILITY. ALL CONSTRUCTION AND DEMOLITION WORKS NEED TO BE PHASED TO MINIMISE OUT OF BALANCE LOADINGS AND AN ASSESSMENT UNDERTAKEN BY THE CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER.
- THE EXISTING BRIDGE PARAPET RC EDGE AND STEEL BARRIER CONDITION IS UNKNOWN. PRIOR TO DEMOLITION OF THE CAST IRON BRIDGE BELOW THE CONTRACTOR IS TO UNDERTAKE A DETAILED CONDITION SURVEY OF THE BRIDGE EDGE & EXISTING PARAPET SAFETY BARRIER. DESIGN AND PROCURE ANY NEW BARRIERS AND FIXINGS REQUIRED, AND INSTALL. REMOVAL OF THE EXISTING CAST-IRON BRIDGE PRIOR TO INSTALLATION/REPAIR OF A SUITABLE SAFETY BARRIER TO THE BRIDGE EDGE IS NOT PERMITTED.



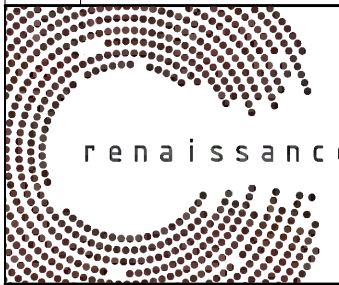
SECTION AA
1:50

RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.



CLADDING SUPPORT FRAME ELEVATIONS
1:50

P01		STAGE 3		09.11.21	GR	KG	
Rev:	Description:			Date:	By:	Chkd:	
 renaissance				Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG			
Project:							
VIADUX PHASE II, MANCHESTER							
Drawing Title:							
PROPOSED GBS BRIDGE SECTIONS AA							
Status:							
RIBA STAGE 3							
Size:	A1	Date:	09.11.21	Drawn by:	GR	Checked by:	KG
Scale:	1:50			Project No:	2102-09		
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:
V12-REN-AA-ZZ-DR-S-01250-P01							

GENERAL NOTES:

- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
- FOR ADDITIONAL NOTES REFER TO DRAWING VI2-REN-AA-ZZ-DR-S-01100.

HEALTH & SAFETY NOTES:

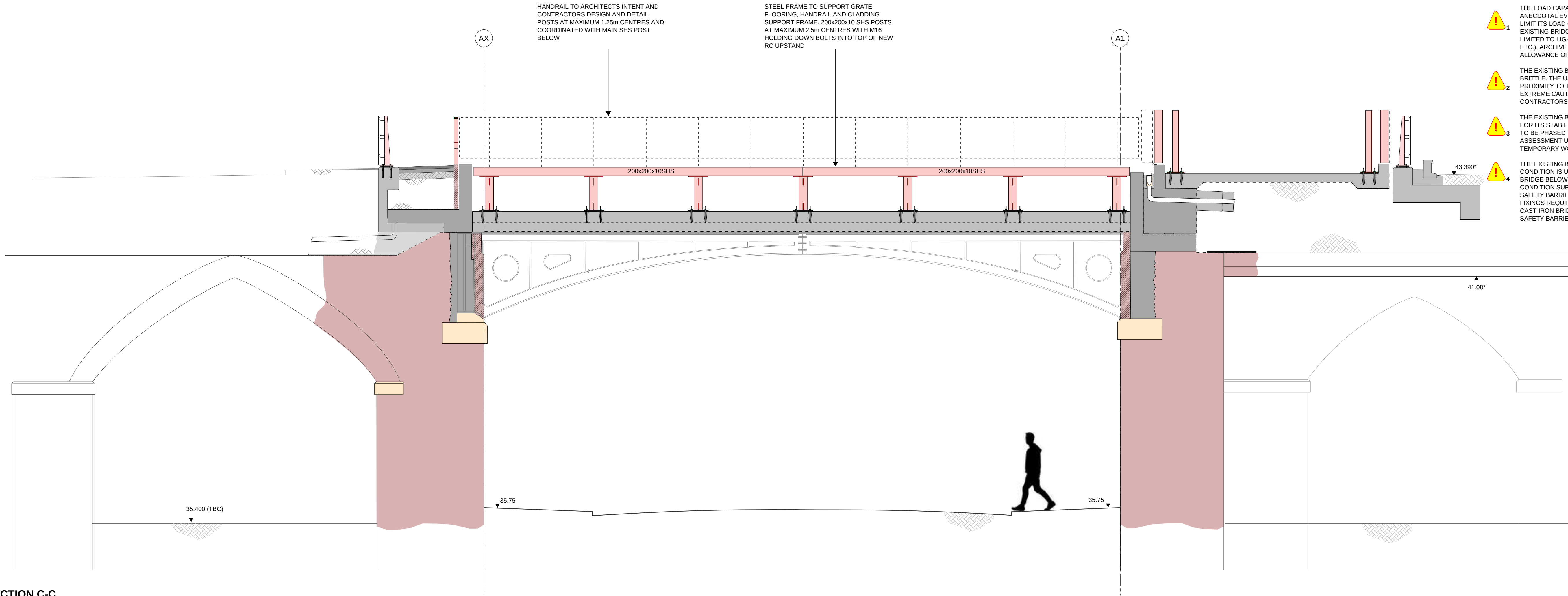
IN ADDITION TO THE NORMAL RISKS, A COMPETENT CONTRACTOR EXPERIENCED IN THIS TYPE OF WORK WOULD BE EXPECTED TO BE AWARE OF. THE FOLLOWING ABNORMAL AND RESIDUAL RISKS FROM THE DESIGN SHOULD BE NOTED AND MANAGED BY THE CONTRACTOR.

- **1**
- **2**
- **3**
- **4**
- THE LOAD CAPACITY OF EXISTING CAST-IRON BRIDGE IS UNKNOWN AND ANECDOTAL EVIDENCE INDICATES IT HAS FRACTURES, WHICH WILL LIMIT ITS LOAD CAPACITY. ALL WORKS UNDERTAKEN TO OR OVER THE EXISTING BRIDGE NEED TO TAKE CONSIDERATION OF THIS (I.E. PLANT LIMITED TO LIGHTWEIGHT MACHINERY, NO STOCKPILING OF MATERIALS ETC.). ARCHIVE DRAWINGS INDICATE A MAXIMUM IMPOSED LOAD ALLOWANCE OF 2.5kN/m².

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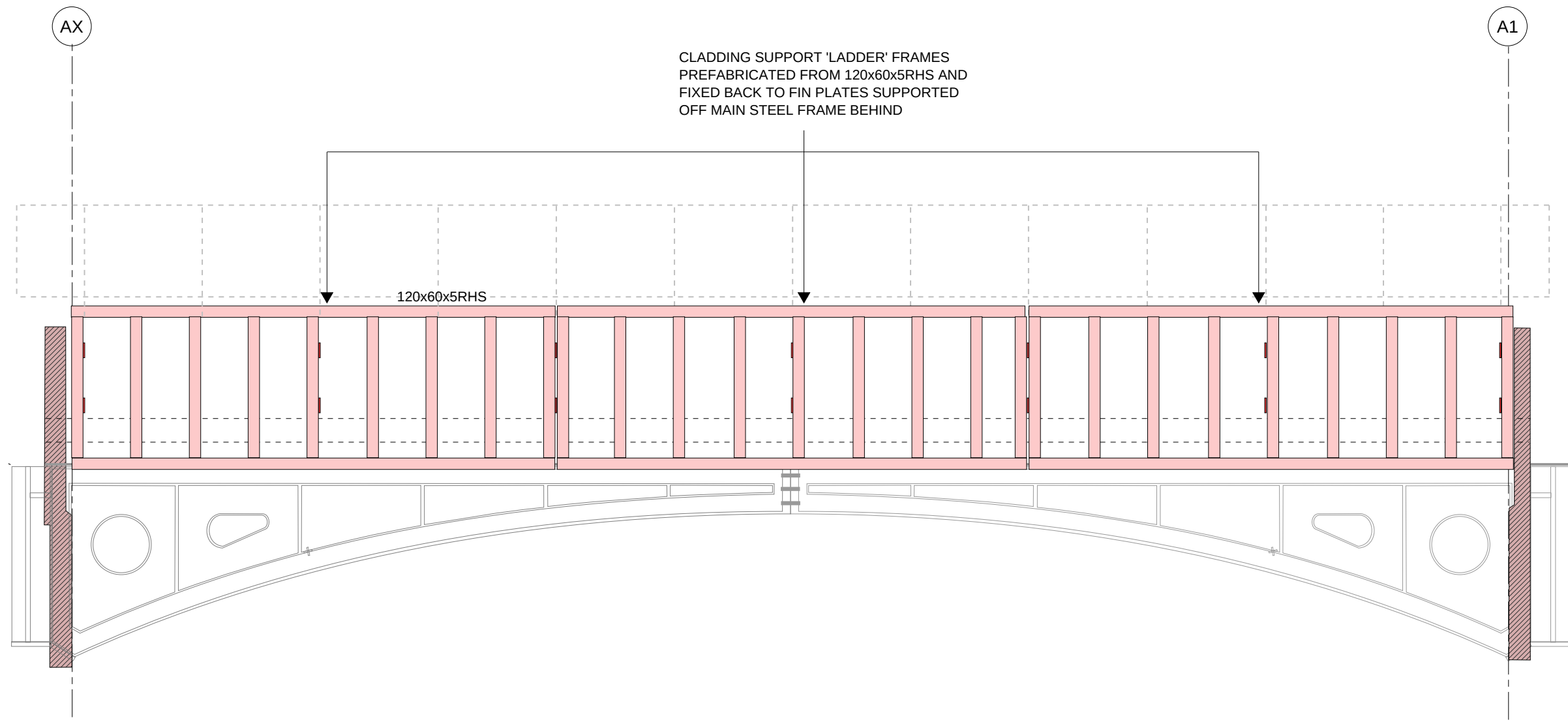
THE EXISTING BRIDGE PARAPET RC EDGE AND STEEL BARRIER CONDITION IS UNKNOWN. PRIOR TO DEMOLITION OF THE CAST IRON BRIDGE BELOW THE CONTRACTOR IS TO UNDERTAKE A DETAILED CONDITION SURVEY OF THE BRIDGE EDGE & EXISTING PARAPET SAFETY BARRIER. DESIGN AND PROCURE ANY NEW BARRIERS AND FIXINGS REQUIRED, AND INSTALL. REMOVAL OF THE EXISTING CAST-IRON BRIDGE PRIOR TO INSTALLATION/REPAIR OF A SUITABLE SAFETY BARRIER TO THE BRIDGE EDGE IS NOT PERMITTED.



SECTION C-C
1:50

RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.



CLADDING SUPPORT FRAME ELEVATIONS
1:50

P01	STAGE 3	09.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:



Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project:

**VIADUX PHASE II,
MANCHESTER**

Drawing Title:

**PROPOSED GBS BRIDGE
SECTIONS BB**

Status:

RIBA STAGE 3

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	09.11.21	GR	GR	KG

Scale: 1:50 Project No: 2102-09

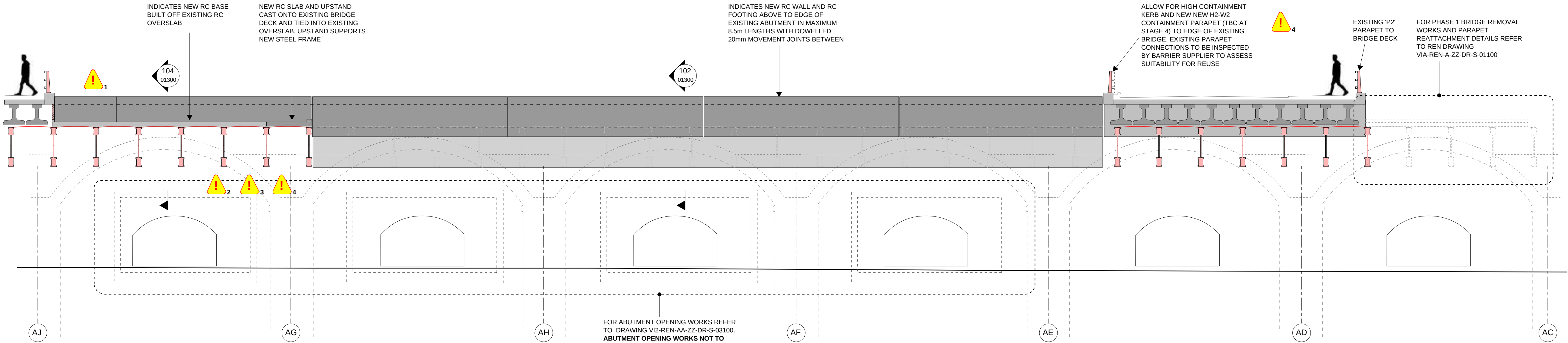
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:
VI2-REN-AA-ZZ-DR-S-01251-P01							

- GENERAL NOTES:**
- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING VI2-REN-AA-ZZ-DR-S-01100.

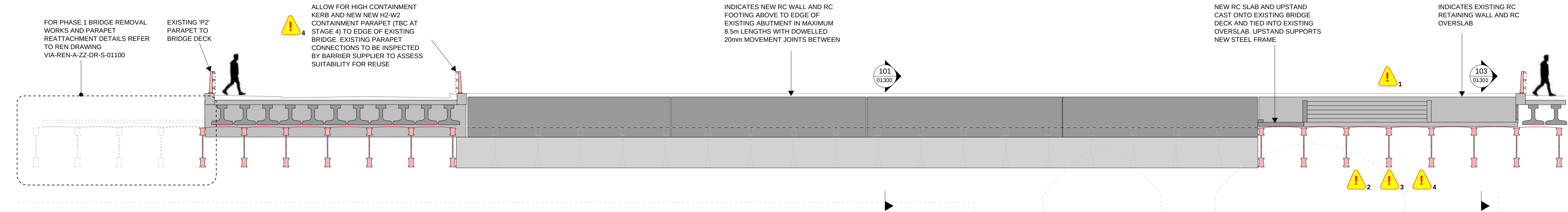
HEALTH & SAFETY NOTES:

IN ADDITION TO THE NORMAL RISKS, A COMPETENT CONTRACTOR EXPERIENCED IN THIS TYPE OF WORK WOULD BE EXPECTED TO BE AWARE OF. THE FOLLOWING ABNORMAL AND RESIDUAL RISKS FROM THE DESIGN SHOULD BE NOTED AND MANAGED BY THE CONTRACTOR.

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SECTION C-C
1:100



SECTION D-D
1:100

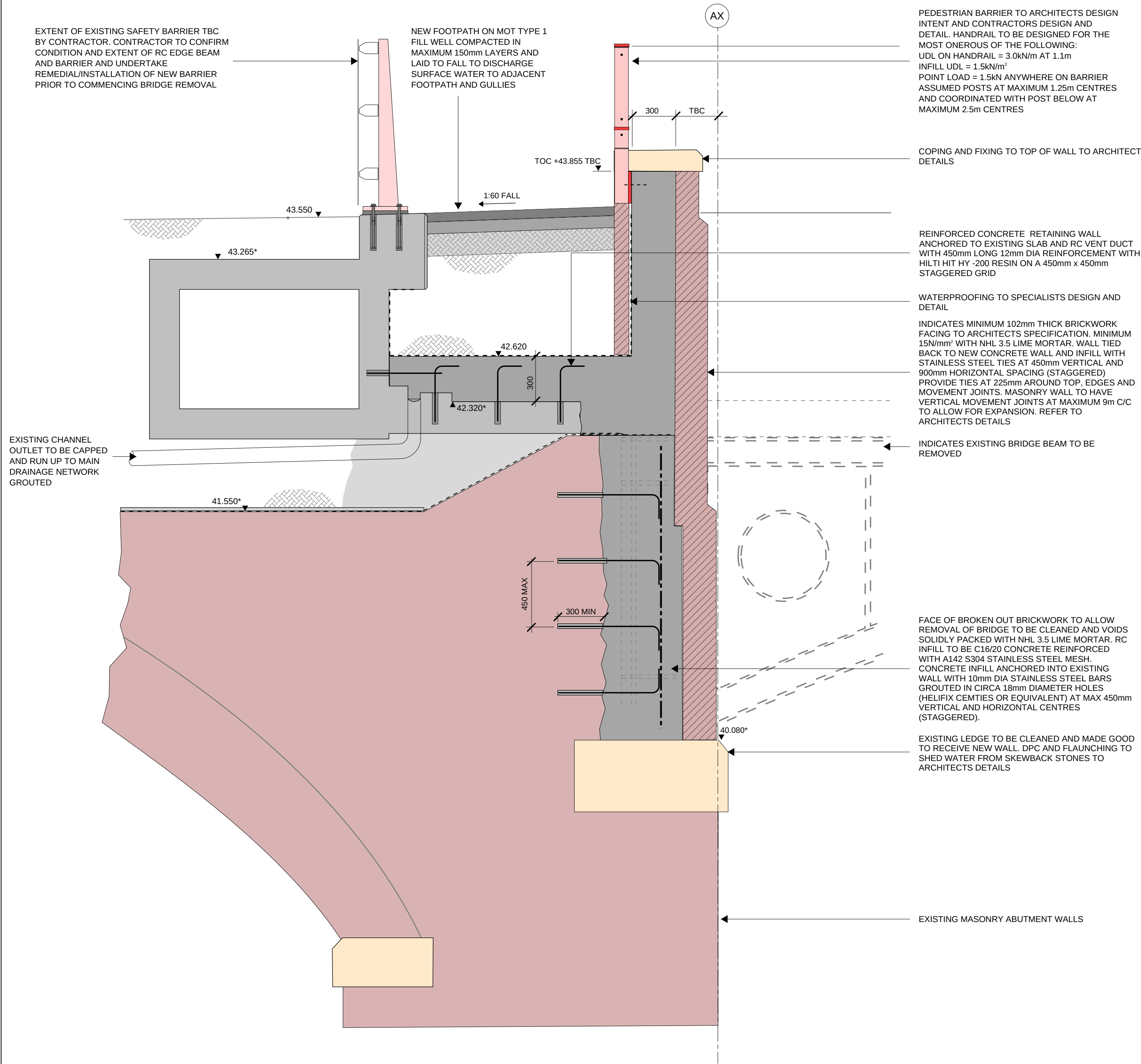
RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

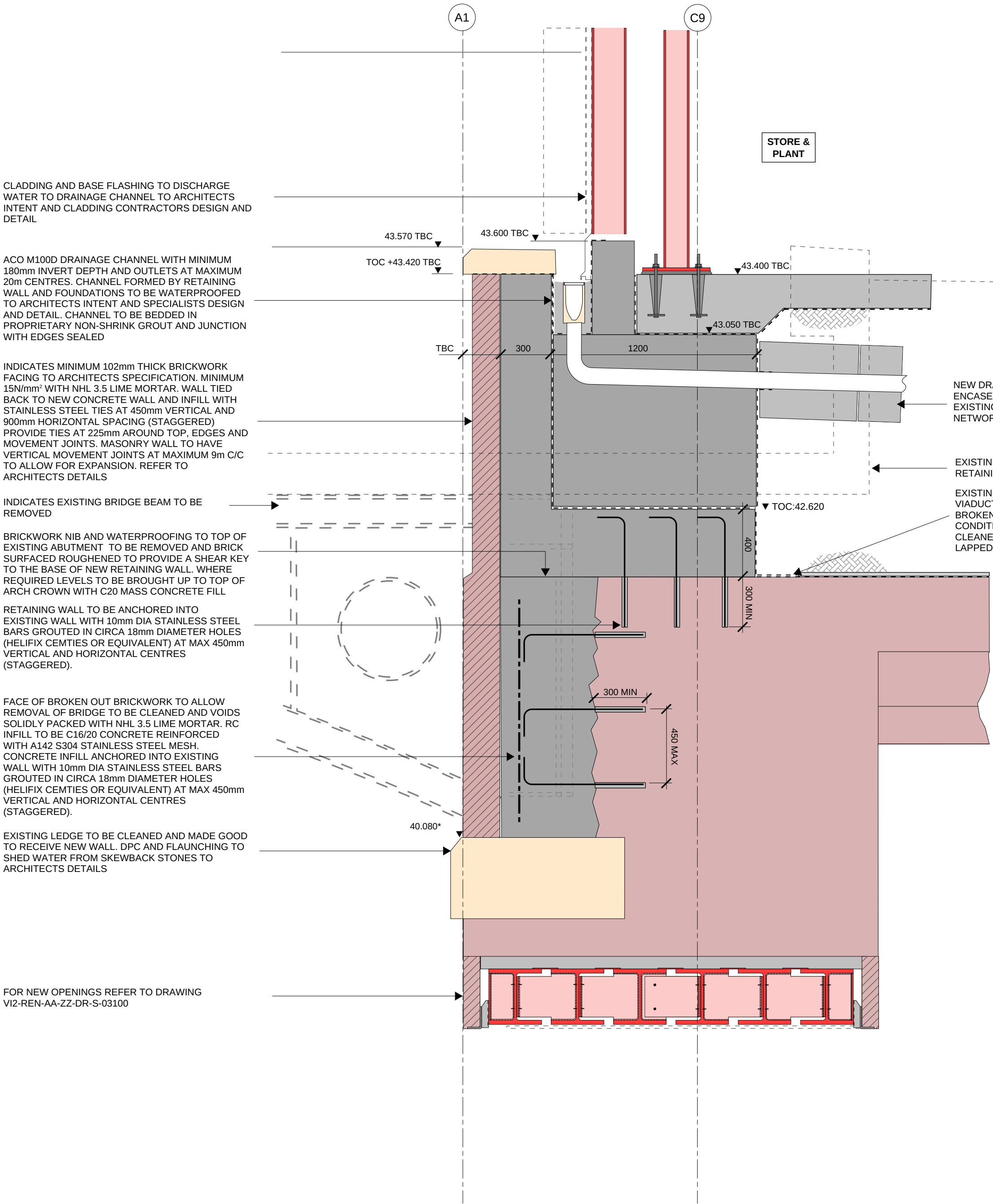
P01	STAGE 3	09.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:
renaissance Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project: VIADUX PHASE II, MANCHESTER				
Drawing Title: PROPOSED GBS BRIDGE SECTIONS CC & DD				
Status: RIBA STAGE 3				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	09.11.21	GR	GR	KG
Scale:	1:100	Project No:	2102-09	
Project:	Originator:	Volume:	Level:	Type:
Rule: Category/Number: Rev:				
VI2-REN-AA-ZZ-DR-S-01252-P01				

- GENERAL NOTES:
- REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING V12-REN-AA-ZZ-DR-S-01100.

RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.
A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.



DETAIL 101
1:20



DETAIL 102
1:20

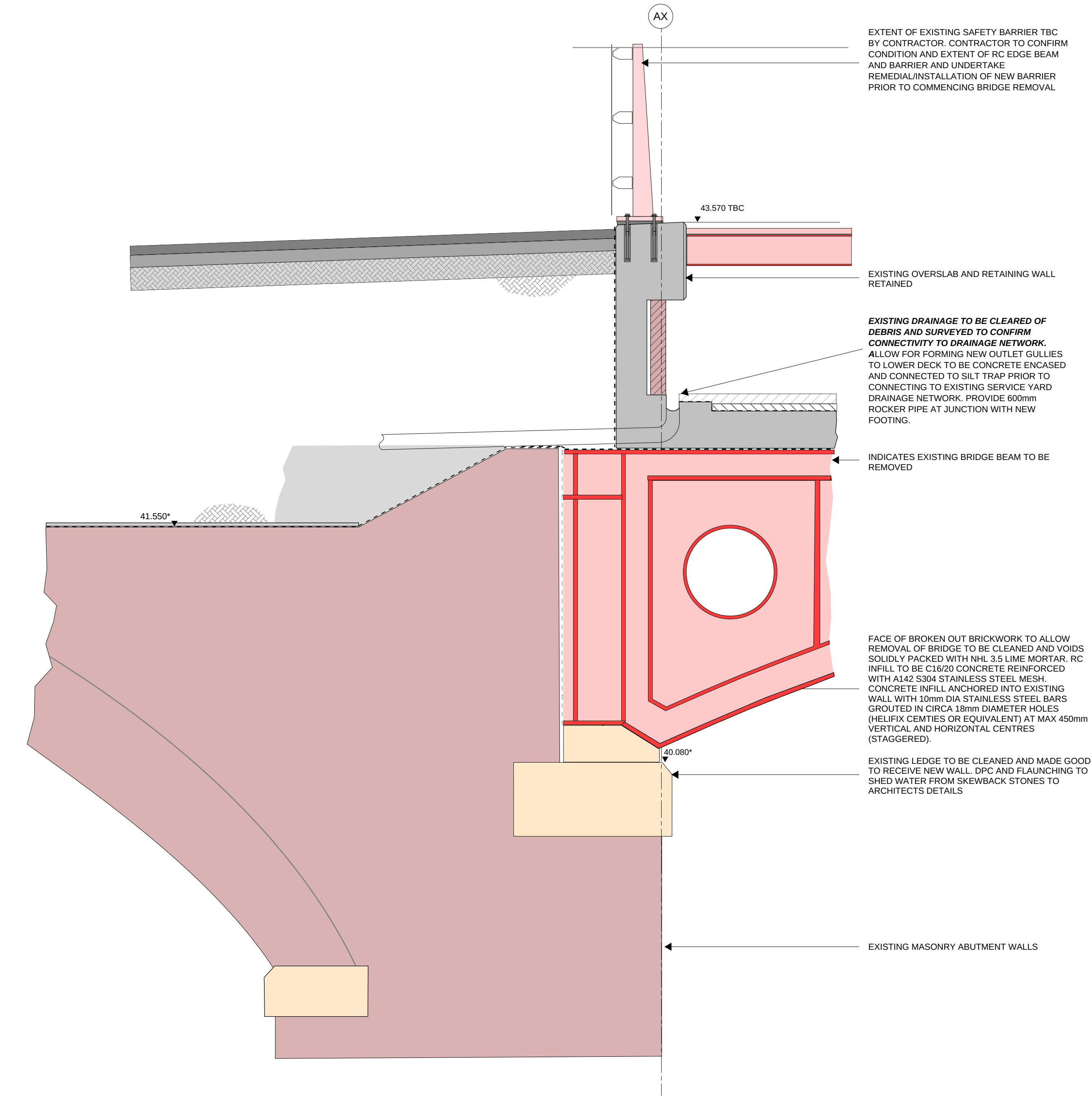
P01	STAGE 3	09.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:
renaissance Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project: VIADUX PHASE II, MANCHESTER				
Drawing Title: PROPOSED GBS BRIDGE DETAILS - SHEET 1				
Status: RIBA STAGE 3				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	09.11.21	GR	GR	KG
Scale:	1:20	Project No:	2102-09	
Project:	Originator:	Volume:	Level:	Type: Rate: Category/Number: Rev:
V12-REN-AA-ZZ-DR-S-01300-P01				

- GENERAL NOTES:**
- REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING V12-REN-AA-ZZ-DR-S-01100.

RIBA STAGE 3

ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.



DETAIL 103
1:20

CLADDING AND BASE FLASHING TO DISCHARGE WATER TO DRAINAGE CHANNEL TO ARCHITECTS INTENT AND CLADDING CONTRACTORS DESIGN AND DETAIL

EXISTING GALVANISED METAL GRATE FLOOR AND SUPPORT STEELWORK SHOWN INDICATIVELY. CONTRACTOR TO SURVEY EXISTING STRUCTURE. ALLOW FOR ADAPTING EXISTING STEELWORK AND FIXING TO EDGE OF NEW RC FOOTING. ALLOW FOR HOT-DIP GALVANISING PANELS AND STEELWORK FOLLOWING ALTERATIONS. BRUSH APPLIED PROTECTION (I.E. GALVAFRROID) IS NOT AN ACCEPTABLE PROTECTION

ACO M100D DRAINAGE CHANNEL WITH MINIMUM 180mm INVERT DEPTH AND OUTLETS AT MAXIMUM 20m CENTRES. CHANNEL FORMED BY RETAINING WALL AND FOUNDATIONS TO BE WATERPROOFED TO ARCHITECTS INTENT AND SPECIALISTS DESIGN AND DETAIL. CHANNEL TO BE BEDDED IN PROPRIETARY NON-SHRINK GROUT AND JUNCTION WITH EDGES SEALED

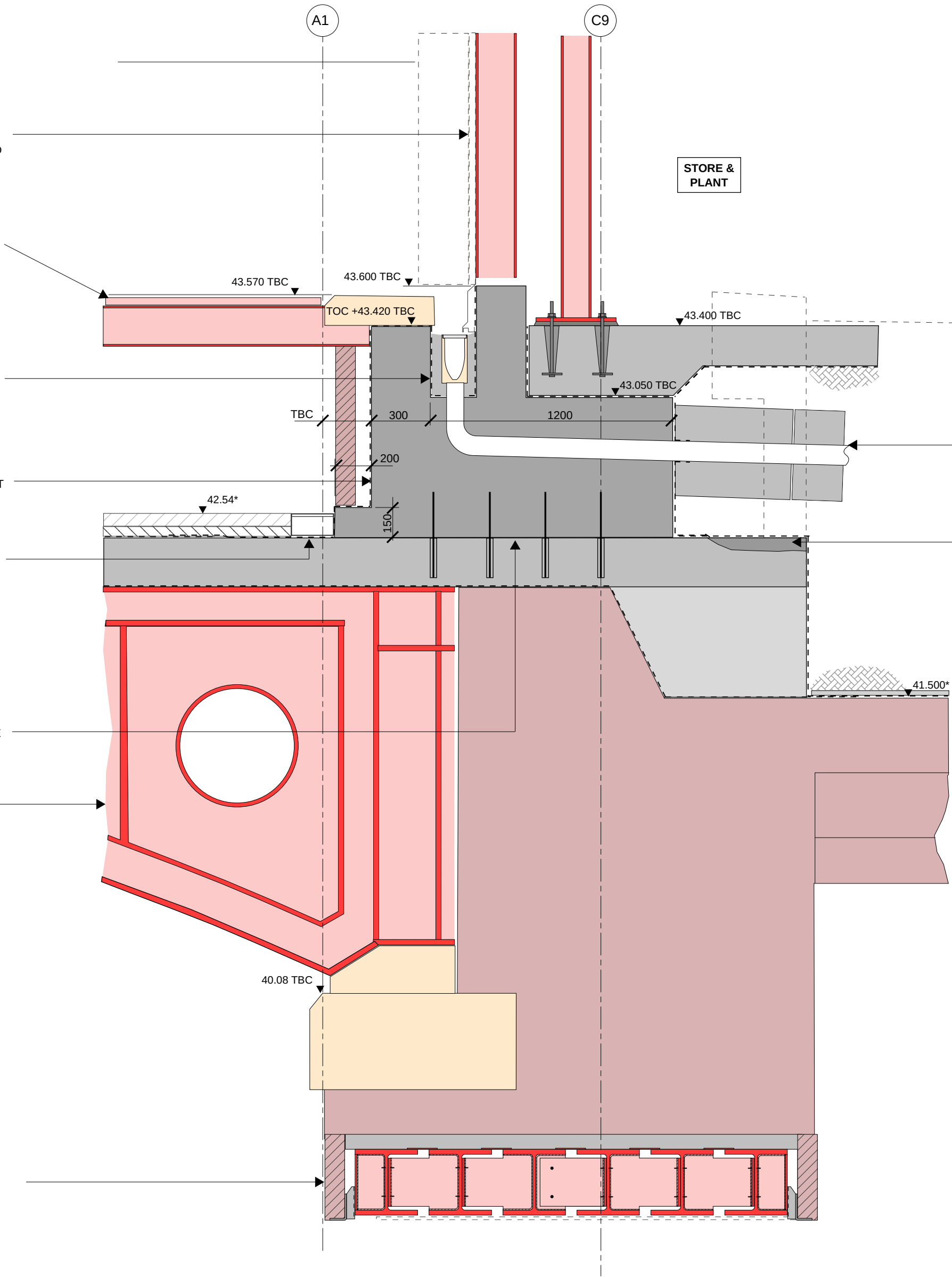
RC CONTINUOUS FOOTING WITH UPSTANDS. BASE CAST ON EXISTING BRIDGEDECK AND KEYED IN WITH WITH 450mm LONG 12mm DIA REINFORCEMENT WITH HILTI HIT HY -200 RESIN ON A 450mm x 450mm STAGGERED GRID

EXISTING PAVING AND BEDDING TO BE LOCALLY REMOVED TO ALLOW FOR LAPPING OF NEW WATERPROOFING. FORMATION OF NEW CHANNEL AND DRAINAGE OUTLET ALL TO ARCHITECTS INTENT AND SPECIALIST DESIGN. EXISTING WATERPROOFING TO BE LAPPED INTO EXISTING AND AROUND CONCRETE ENCASEMENT TO SPECIALIST WATERPROOFING SUPPLIERS DETAILS. PAVING TO BE REINSTATED FOLLOWING DRAINAGE INSTALLATION. REFER TO DETAIL A FOR DRAINAGE OUTLET DETAIL

WATERPROOFING TO TOP OF EXISTING RC OVERSLAB TO BE REMOVED AND SURFACE SCABBLD TO PROVIDE A SHEAR KEY TO THE BASE OF NEW RETAINING WALL

INDICATES EXISTING BRIDGE BEAM AND DECK TO BE RETAINED

FOR NEW OPENINGS REFER TO DRAWING V12-REN-AA-ZZ-DR-S-03100

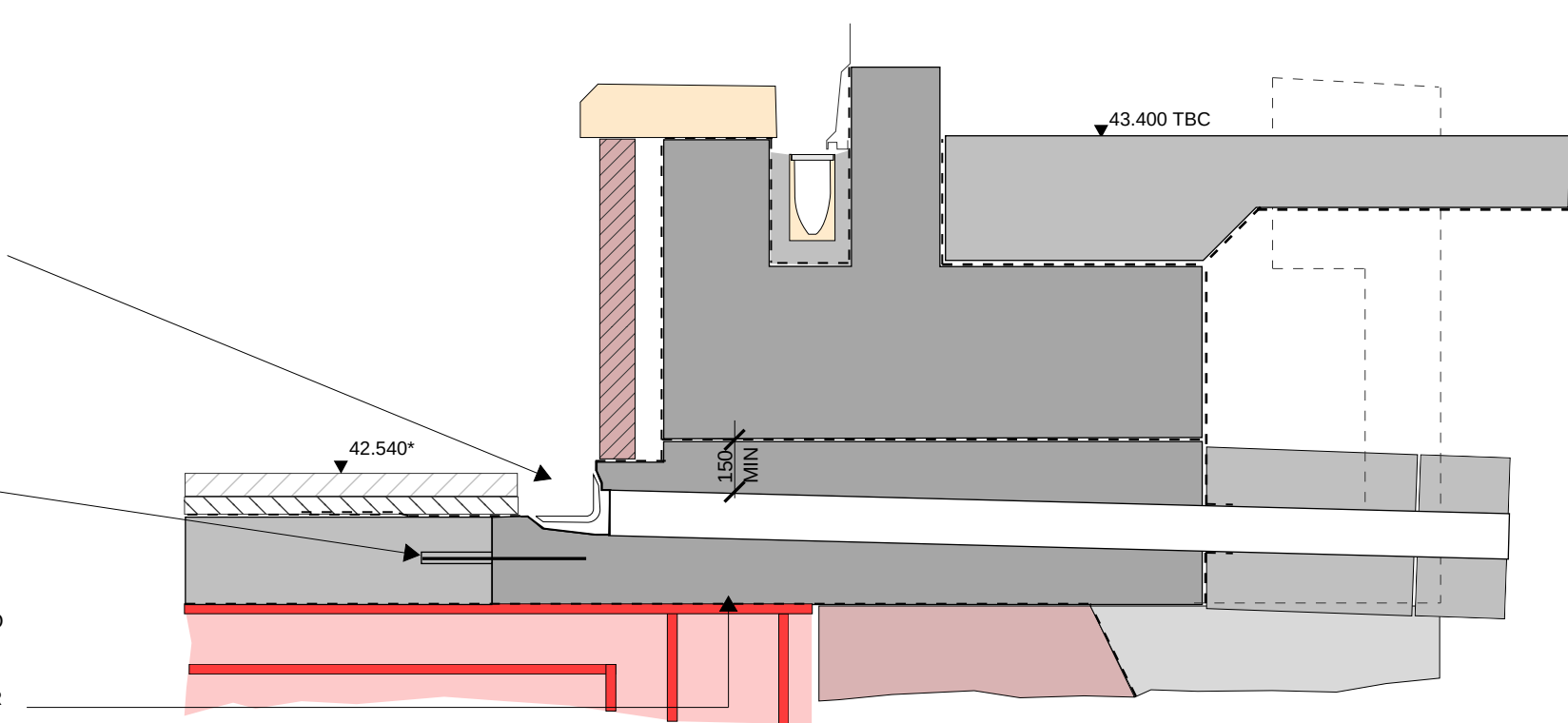


DETAIL 104
1:20

EXISTING RC OVERSLAB CAREFULLY CUT BACK, WATERPROOFING MADE GOOD AND DRAINAGE OUTLET INSTALLED TO ARCHITECTS INTENT AND SPECIALIST DESIGN. FOLLOWING CONCRETE ENCASEMENT NEW WATERPROOFING TO BE LAPPED INTO EXISTING AND AROUND CONCRETE ENCASEMENT TO SPECIALIST WATERPROOFING SUPPLIERS DETAILS

NEW ENCASEMENT SECTION FIXED TO EXISTING OVERSLAB WITH 2No M16 400 LONG REINFORCEMENT BARS FIXED WITH HILTI HIT HY -200 RESIN

NEW DRAINAGE TO LOWER DECK TO BE CONCRETE ENCASED AND CONNECTED TO SILT TRAP PRIOR TO CONNECTING TO EXISTING SERVICE YARD DRAINAGE NETWORK. PROVIDE 600mm ROCKER PIPE AT JUNCTION WITH NEW FOOTING. ALLOW FOR LOCALLY CUTTING OUT EXISTING SLAB AND PROVIDING A MINIMUM 150mm CONCRETE ENCASEMENT TO PIPE. JUNCTION BETWEEN CUT EXISTING SLAB AND CONCRETE ENCASEMENT TO BE CLEANED AND PRE-WETTED PRIOR TO CONCRETING

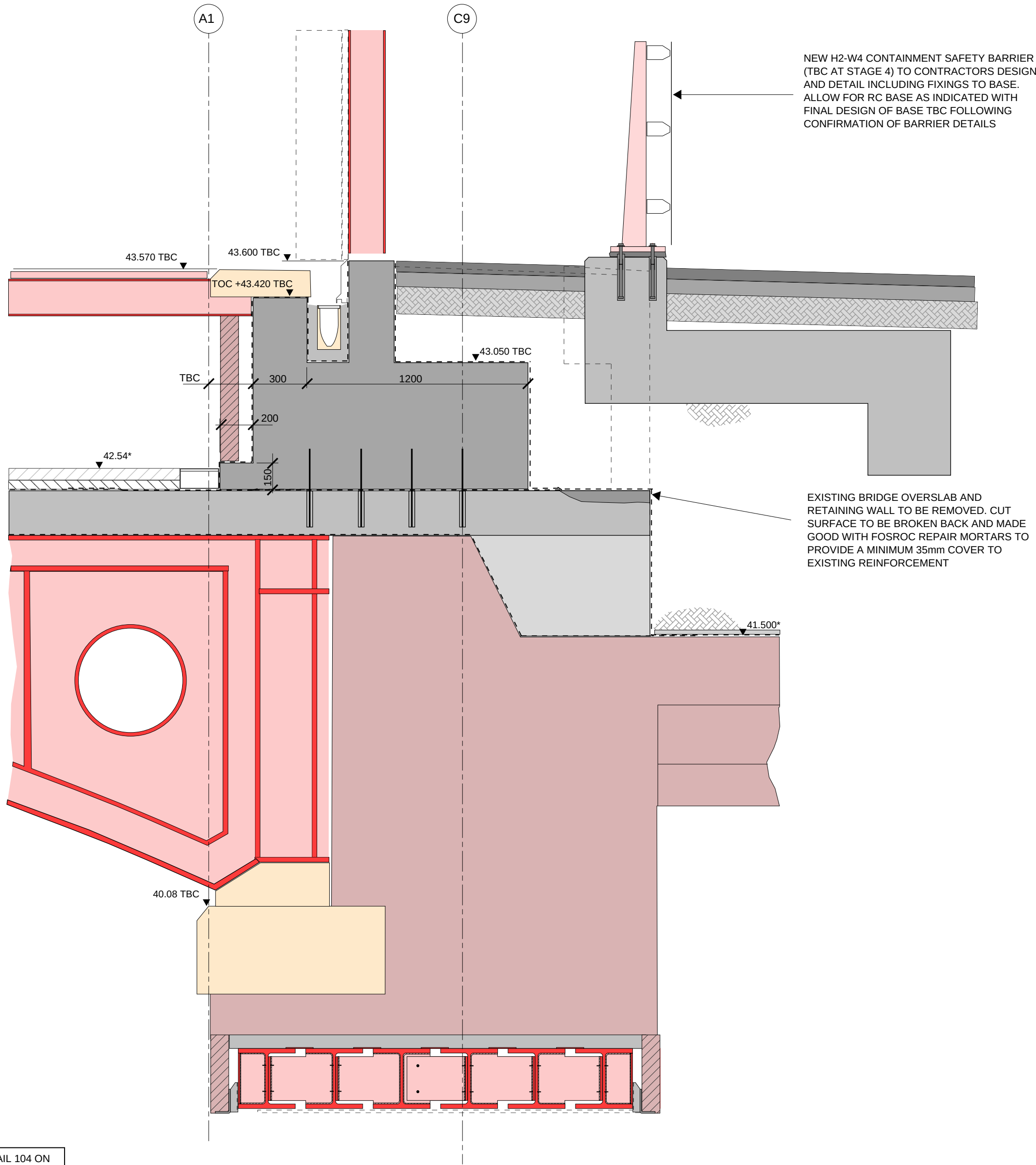


DETAIL A - NEW LOWER DECK DRAINAGE OUTLET
1:20

P01	STAGE 3	09.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:
renaissance Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG Project:				
VIADUX PHASE II, MANCHESTER Drawing Title: PROPOSED GBS BRIDGE DETAILS - SHEET 2 Status: RIBA STAGE 3				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	09.11.21	GR	GR	KG
Scale:	1:20	Project No:	2102-09	
Project:	Originator:	Volume:	Level:	Type:
				Rate:
				Category/Number:
				Rev:
V12-REN-AA-ZZ-DR-S-01301-P01				

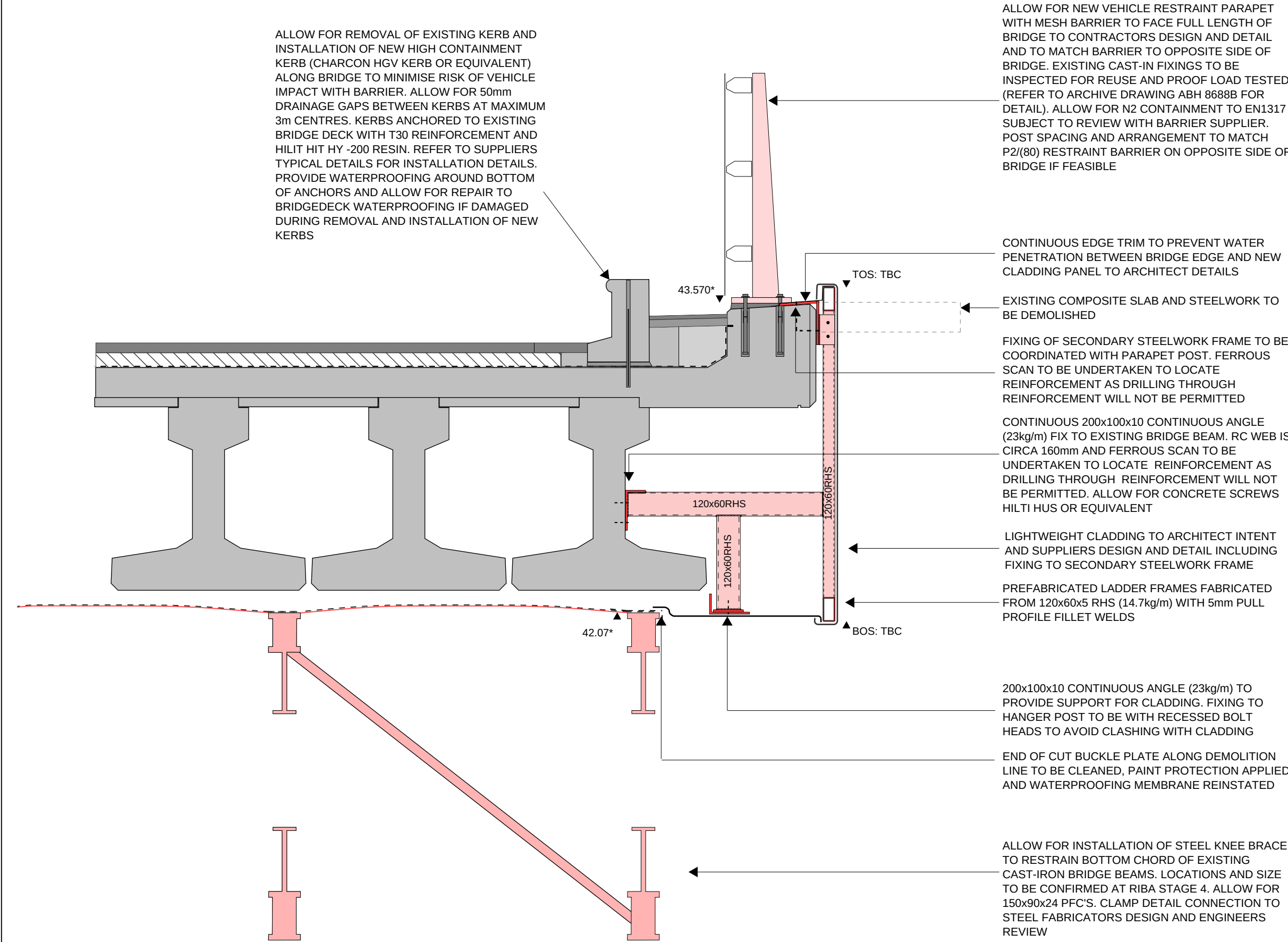
- GENERAL NOTES:
- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING VI2-REN-AA-ZZ-DR-S-01100.

RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.
A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

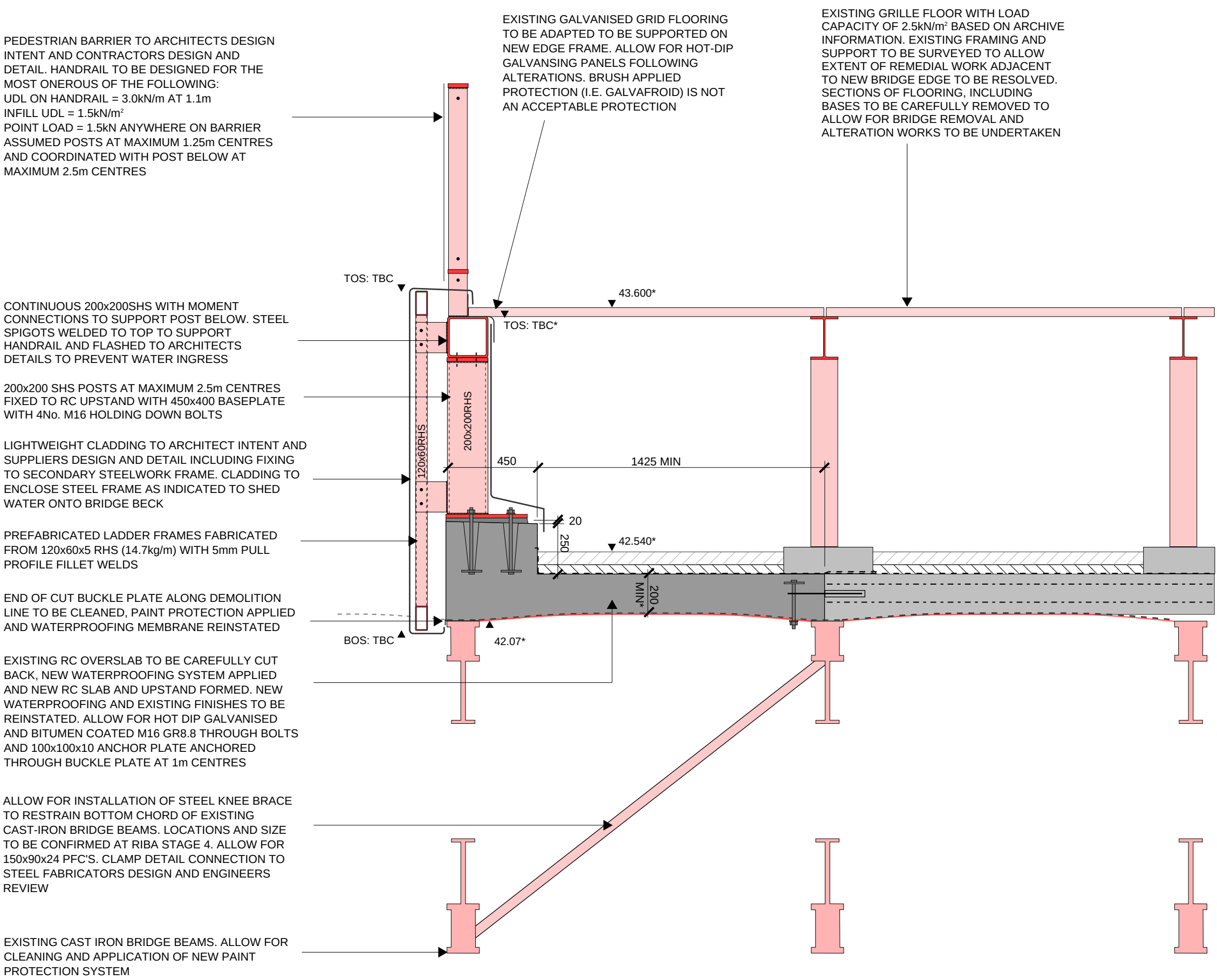


DETAIL 105
1:20

P01	STAGE 3	09.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:
renaissance Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG Project: VIADUX PHASE II, MANCHESTER Drawing Title: PROPOSED GBS BRIDGE DETAILS - SHEET 3 Status: RIBA STAGE 3 Size: A1 Date: 09.11.21 Drawn by: GR Designed by: GR Checked by: KG Scale: 1:20 Project No: 2102-09 Project: Originator: Volume: Level: Type: Rate: Category/Number: Rev: VI2-REN-AA-ZZ-DR-S-01302-P01				



DETAIL 110
1:20

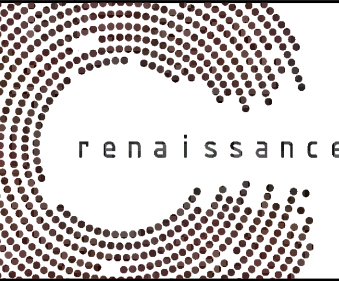


DETAIL 111
1:20

- GENERAL NOTES:**
- REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING V12-REN-AA-ZZ-DR-S-01100.

RIBA STAGE 3
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P01	STAGE 3	09.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:



Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project:
**VIADUX PHASE II,
MANCHESTER**

Drawing Title:
**PROPOSED GBS BRIDGE
DETAILS - SHEET 4**

Status:
RIBA STAGE 3

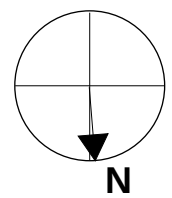
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	09.11.21	GR	GR	KG

Scale:	1:20	Project No:	2102-09				
Project:	Originator:	Volume:	Level:	Type:	Rate:	Category/Number:	Rev:

V12-REN-AA-ZZ-DR-S-01303-P01

APPENDIX B

GREAT BRIDGEWATER STREET ABUTMENT
OPENINGS DRAWINGS



HEALTH & SAFETY NOTES:

-  BRIDGE REMOVAL IS TO BE COMPLETE PRIOR TO FORMING OF NEW OPENINGS WITHIN EXISTING BRIDGE ABUTMENT. SIGNIFICANT TEMPORARY WORKS AND PHASING REQUIRED TO SAFELY FORM NEW OPENINGS AND IS TO BE DEVELOPED BY THE CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER
-  ABUTMENT OPENING BELOW EXISTING BRIDGE WILL REQUIRE SIGNIFICANT TEMPORARY WORKS AND PHASING TO SAFELY FORM NEW OPENINGS AND IS TO BE DEVELOPED BY THE CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER
-  VIBRATION AND MOVEMENT MONITORING IS REQUIRED DURING THE WORKS WITHIN THE ARCHES
-  EXISTING SHALLOW SERVICES WITHIN THE PAVEMENT. CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER TO CONFIRM LOCATION ON SITE AND DESIGN WORKS TO MINIMISE THE RISK OF DAMAGE. DUE TO THE HIGH PROPPING LOADS IT MAY BE NECESSARY TO SPLIT DUCT AND CAST SERVICES WITHIN A SPREADER SLAB.

GENERAL NOTES:

- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
- ALL STEELWORK TO BE FABRICATED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL STRUCTURAL STEELWORK SPECIFICATION AND RENAISSANCE PROJECT STEELWORK SPECIFICATION.
- ALL STEELWORK TO BE S355 J2 U.N.O. FINAL SUBGRADE IS TO BE CONFIRMED DURING TECHNICAL DESIGN WITH INPUT FROM THE STEELWORK FABRICATOR ONCE THE CONNECTION DETAILS ARE KNOWN.
- CONCRETE TO FOUNDATIONS AND ENCASEMENT TO STEELWORK TO BE RC35/45.
- WHERE FEASIBLE EXISTING GOOD QUALITY MASONRY UNITS ARE TO BE SALVAGED AND CLEANED FOR REUSE WITHIN THE WORKS. THE GLAZED BRICKS TO GREAT BRIDGEWATER STREET ARE TO ALSO BE SALVAGED AND REUSED FOR REINSTATEMENT OF BRICKWORK AROUND THE NEW OPENINGS.
- WHERE NEW BRICKS ARE REQUIRED THAT ARE NOT EXPOSED IN THE FINISHED WORKS THESE ARE TO BE SOLID CLASS B CLAY ENGINEERING BRICKS. ALL EXPOSED MASONRY TO BE SUITABLY SOURCED TO MATCH EXISTING.
- NO CEMENT BASED MORTAR IS PERMITTED FOR USE WITHIN REINSTATEMENT WORKS OF MASONRY. ALLOW FOR NEW AND REPAIR WORKS UNDERTAKEN TO BE WITH A LIME MORTAR.
HLM 3.5 - GENERAL MASONRY WORKS 150mm ABOVE GROUND LEVEL
HLM 5.0 - WORKS BELOW GROUND
FINAL MORTAR SPECIFICATION TO BE IN ACCORDANCE WITH THE HERITAGE ARCHITECTS SPECIFICATION AND SUBJECT TO AGREEMENT WITH THE ENGINEER.
- PACKING WORKS BETWEEN STEELWORK AND EXISTING MASONRY TO BE UNDERTAKEN WITH NON-SHRINK PROPRIETARY GROUT INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.

STEELWORK PROTECTION SYSTEM

ALL STEELWORK TO RECEIVE THE FOLLOWING CORROSION PROTECTION SYSTEM:

- MINIMUM 85 µm HOT-DIP GALVANISING TO BS EN ISO 1461.
- IN ADDITION ALL NON-VISIBLE STEELWORK AND STEELWORK IN CONTACT WITH GROUT AND THE EXISTING MASONRY ARCHES IS TO BE PROTECTED WITH:
- TWO COATS HEAVY DUTY BITUMENT, 200 µm TOTAL

ALL BOLTED CONNECTIONS TO BE HOT-DIP GALVANISED.
FINAL DESIGN AND TECHNICAL REQUIREMENTS TO BE DEVELOPED DURING RIBA STAGE 4.
COMPATIBILITY OF PAINT PROTECTION SYSTEMS TO GALVANISED STEELWORK TO BE CONFIRMED OR ALTERNATIVE PROPOSED BY STEEL FABRICATORS PAINT SUPPLIER.
ALL NON-ACCESSIBLE STEELWORK IS TO HAVE A MINIMUM CORROSION PROTECTION LIFE OF 60 YEARS WITH NO MAINTENANCE.

DETAILS - SURVEYS

ALL DETAILS ARE INDICATIVE ONLY TO ALLOW FOR STAGE 3 COSTING. THE DETAILS ARE DEPENDANT ON THE FINDINGS FROM THE SURVEY WORKS. THE DETAIL WILL THEREFORE BE CONFIRMED DURING RIBA STAGE 4.

FAÇADE WORKS TO GRADE II LISTED BUILDING

FOR CLEANING, LOCALISED REPAIR AND REPOINTING WORKS TO THE GRADE II LISTED VIADUCT STRUCTURE REFER TO ARCHITECTS AND HERITAGE ARCHITECTS DRAWINGS, DETAILS AND SPECIFICATION.

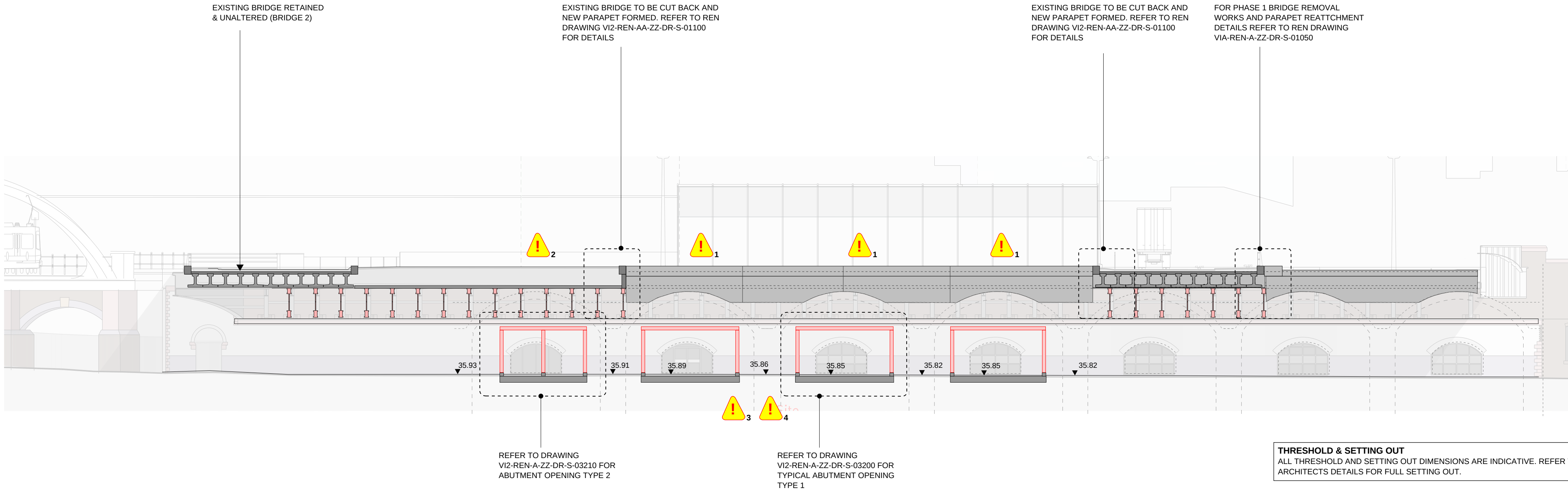
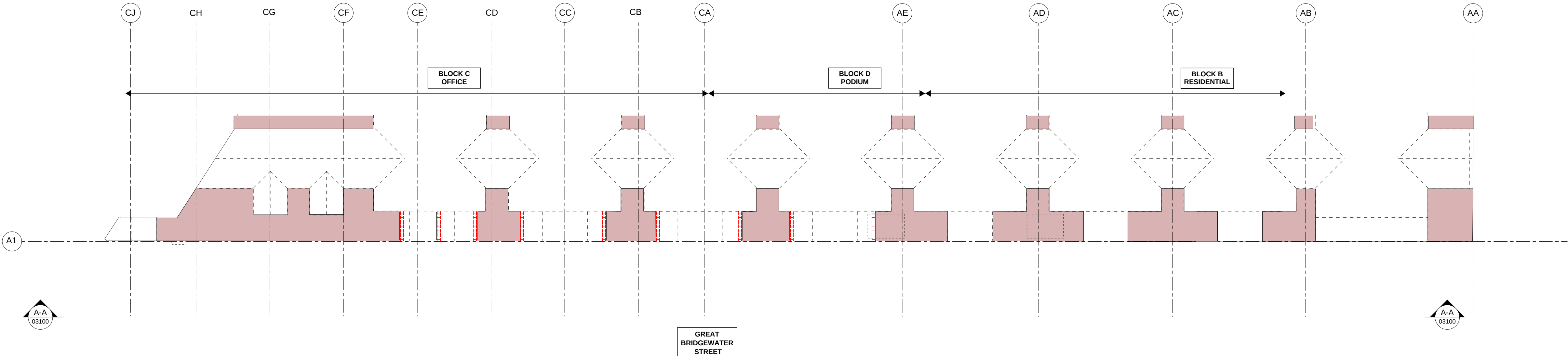
RIBA STAGE 3

ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

PARTIAL GROUND FLOOR PLAN

1:200



PARTIAL GROUND FLOOR ELEVATION

1:200

P01	STAGE 3	03.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:



VIADUX PHASE II, MANCHESTER

ABUTMENT OPENING PLAN & ELEVATION

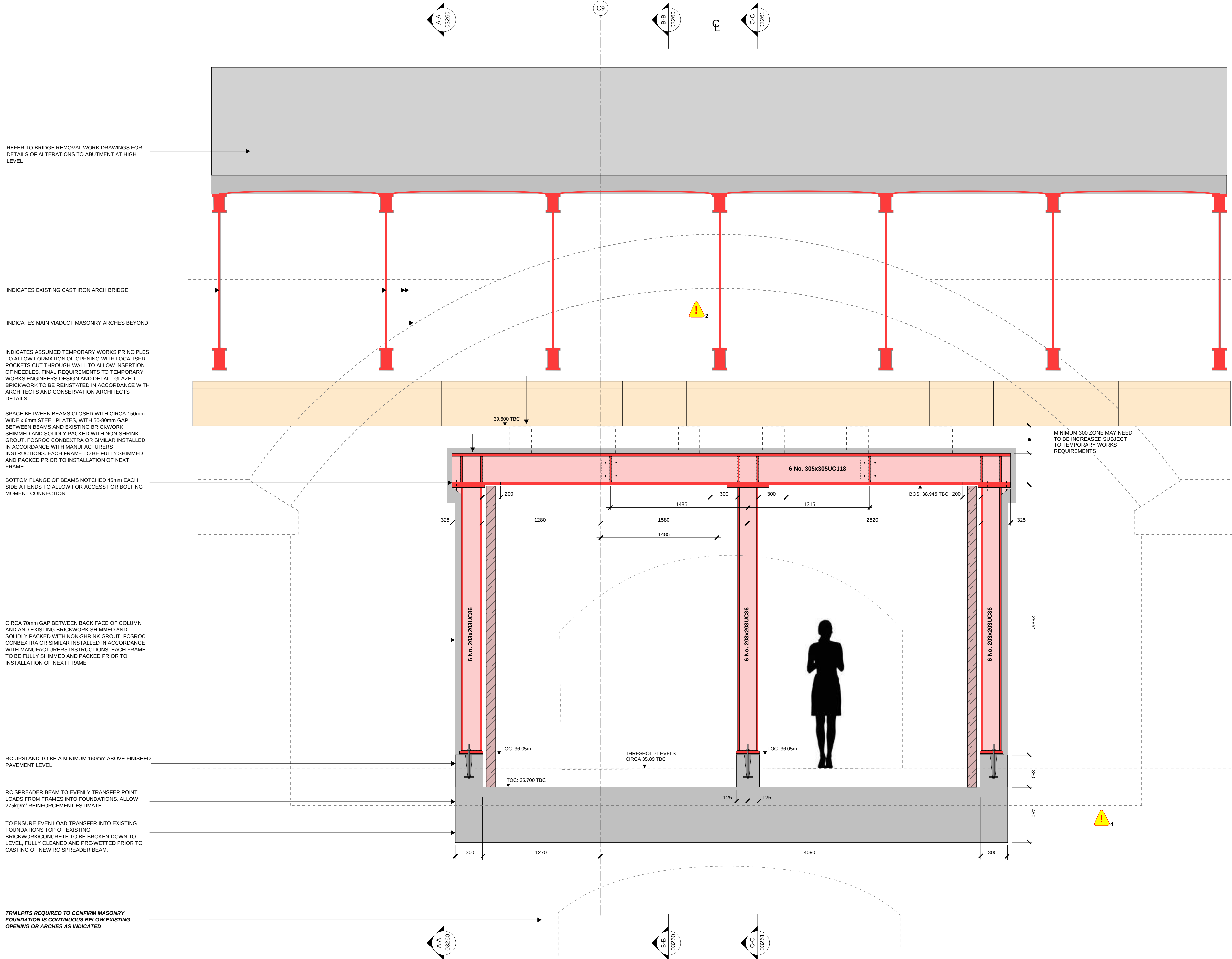
RIBA STAGE 3

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	03.11.21	GR	GR	KG

Scale:	1:200	Project No:	2102-09
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Project:	Originator:	Volume:	Level:	Type:	Rate:	Category/Number:	Rev:
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VI2-REN-AA-ZZ-DR-S-03100-P01



- GENERAL NOTES:**
- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING VI2-REN-AA-ZZ-DR-S-03100.

- HEALTH & SAFETY NOTES:**
- 2 ABUTMENT OPENING BELOW EXISTING BRIDGE WILL REQUIRE SIGNIFICANT TEMPORARY WORKS AND PHASING TO SAFELY FORM NEW OPENINGS AND IS TO BE DEVELOPED BY THE CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER
- 4 EXISTING SHALLOW SERVICES WITHIN THE PAVEMENT. CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER TO CONFIRM LOCATION ON SITE AND DESIGN WORKS TO MINIMISE THE RISK OF DAMAGE. DUE TO THE HIGH PROPPING LOADS IT MAY BE NECESSARY TO SPLIT DUCT AND CAST SERVICES WITHIN A SPREADER SLAB.

KEY

* INDICATES DIMENSIONS AND LEVEL TO BE CONFIRMED ON SITE AND AGREE WITH THE ARCHITECT AND ENGINEER PRIOR TO FABRICATION AND EXECUTION OF THE WORKS

RIBA STAGE 3

ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

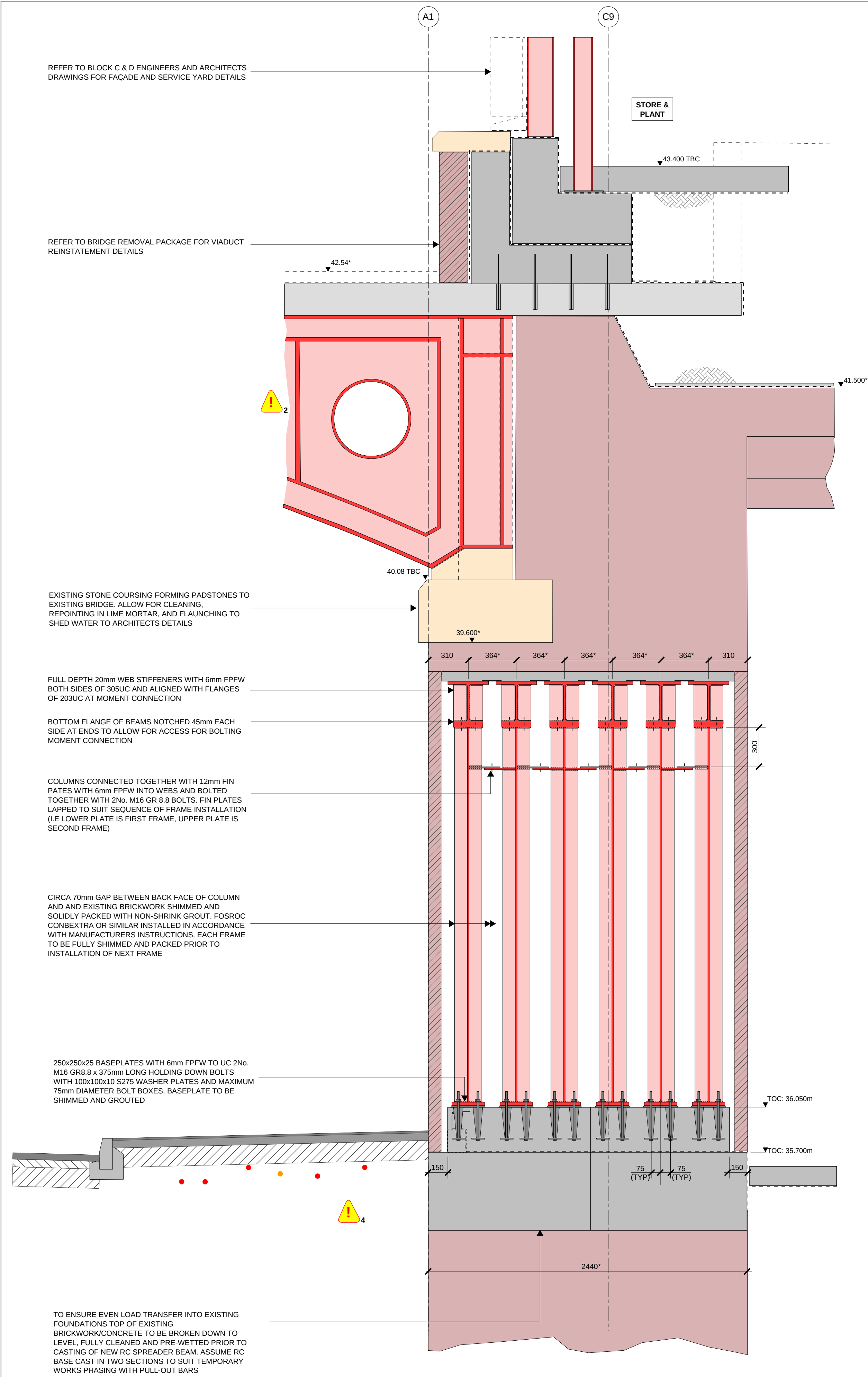
A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

P01	STAGE 3	03.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:
 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project: VIADUX PHASE II, MANCHESTER				
Drawing Title: ABUTMENT OPENING TYPE 2 - ELEVATION				
Status: RIBA STAGE 3				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	03.11.21	GR	GR	KG
Scale:	1:20	Project No:	2102-09	
Project:	Originator:	Volume:	Level:	Type:
Role:	Category/Number:	Rev:		
VI2-REN-AA-ZZ-DR-S-03210-P01				

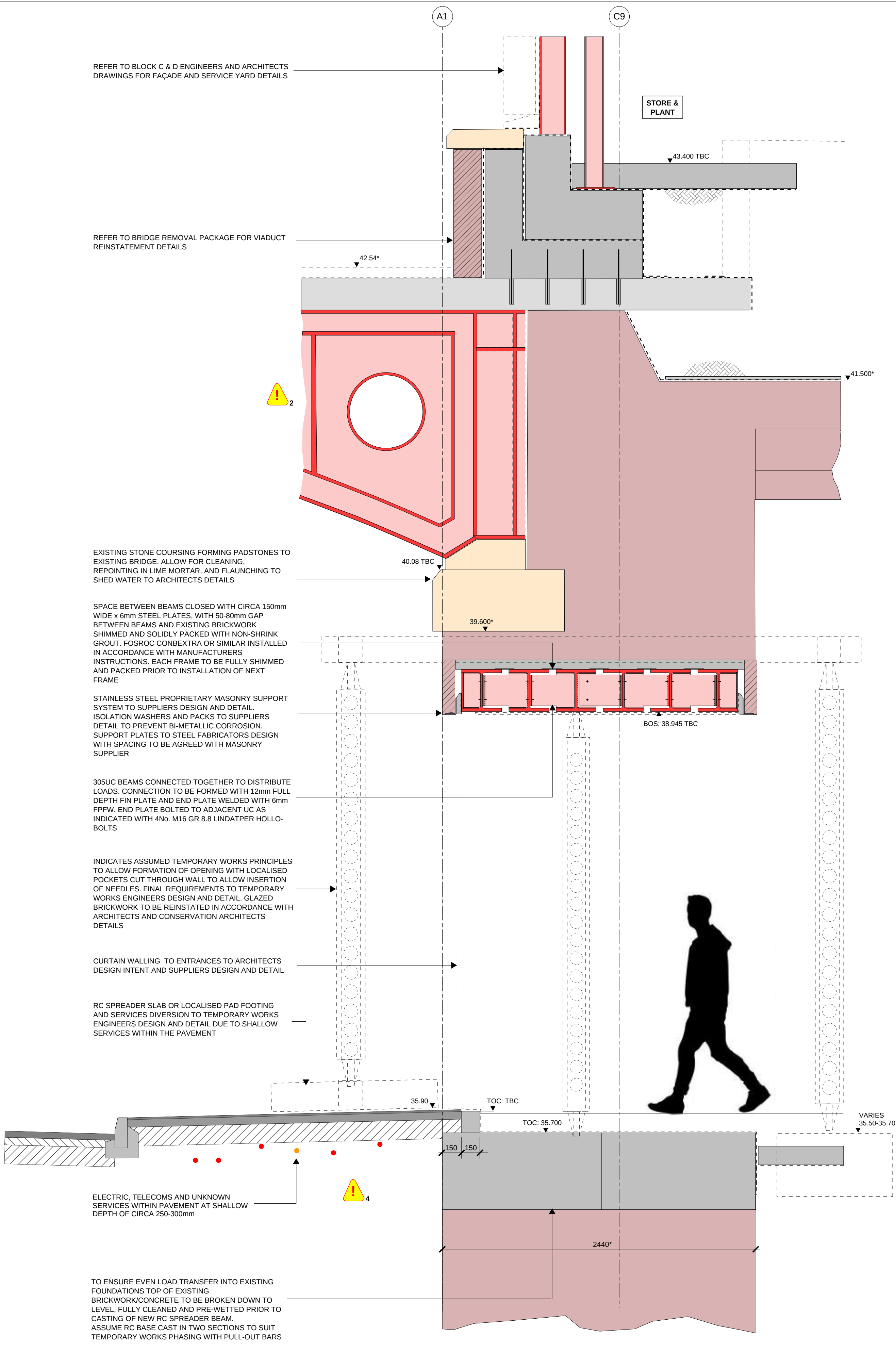
DETAIL 102
TYPE 2 - ABUTMENT WALL OPENING ELEVATION
1:20



VI2-REN-AA-ZZ-DR-S-03250-P01



SECTION A-A
1:20



SECTION B-B
1:20

- GENERAL NOTES:**
- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING VI2-REN-AA-ZZ-DR-S-03100.

- HEALTH & SAFETY NOTES:**
- ! 2 ABUTMENT OPENING BELOW EXISTING BRIDGE WILL REQUIRE SIGNIFICANT TEMPORARY WORKS AND PHASING TO SAFELY FORM NEW OPENINGS AND IS TO BE DEVELOPED BY THE CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER
- ! 4 EXISTING SHALLOW SERVICES WITHIN THE PAVEMENT. CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER TO CONFIRM LOCATION ON SITE AND DESIGN WORKS TO MINIMISE THE RISK OF DAMAGE. DUE TO THE HIGH PROPPING LOADS IT MAY BE NECESSARY TO SPLIT DUCT AND CAST SERVICES WITHIN A SPREADER SLAB.

KEY

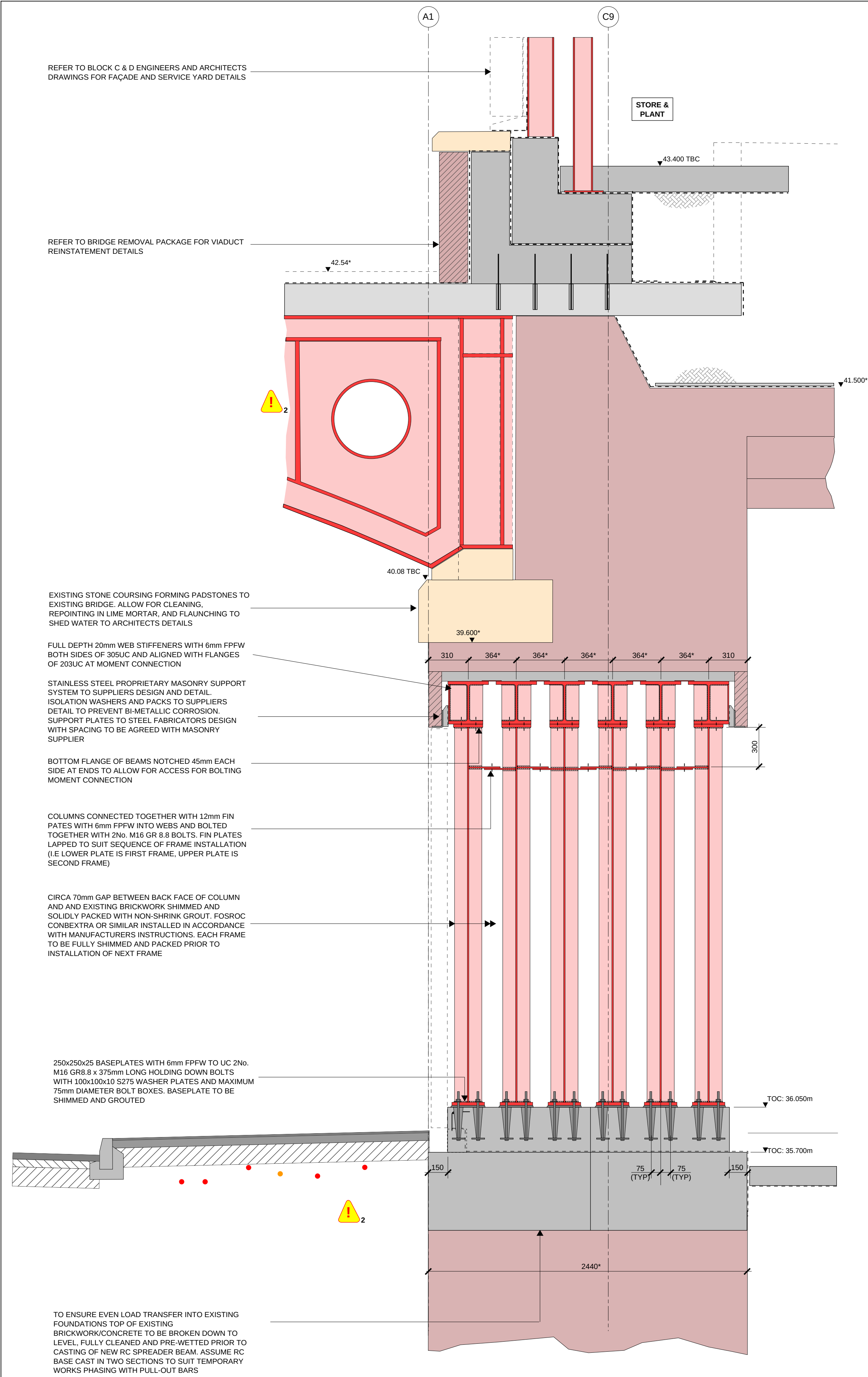
* INDICATES DIMENSIONS AND LEVEL TO BE CONFIRMED ON SITE AND AGREE WITH THE ARCHITECT AND ENGINEER PRIOR TO FABRICATION AND EXECUTION OF THE WORKS

RIBA STAGE 3

ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

P01	STAGE 3	03.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:
 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project:				
VIADUX PHASE II, MANCHESTER				
Drawing Title:				
ABUTMENT OPENING TYPE 2 SECTIONS (SHEET 1)				
Status:				
RIBA STAGE 3				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	03.11.21	GR	GR	KG
Scale:	1:20	Project No:	2102-09	
Project:	Originator:	Volume:	Level:	Type: Rate: Category/Number: Rev:
VI2-REN-AA-ZZ-DR-S-03260-P01				



SECTION C-C
1:20

- GENERAL NOTES:**
- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING VI2-REN-AA-ZZ-DR-S-03100.

- HEALTH & SAFETY NOTES:**
- 2** ABUTMENT OPENING BELOW EXISTING BRIDGE WILL REQUIRE SIGNIFICANT TEMPORARY WORKS AND PHASING TO SAFELY FORM NEW OPENINGS AND IS TO BE DEVELOPED BY THE CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER
- 4** EXISTING SHALLOW SERVICES WITHIN THE PAVEMENT. CONTRACTOR AND THEIR TEMPORARY WORKS ENGINEER TO CONFIRM LOCATION ON SITE AND DESIGN WORKS TO MINIMISE THE RISK OF DAMAGE. DUE TO THE HIGH PROPPING LOADS IT MAY BE NECESSARY TO SPLIT DUCT AND CAST SERVICES WITHIN A SPREADER SLAB.

KEY

* INDICATES DIMENSIONS AND LEVEL TO BE CONFIRMED ON SITE AND AGREE WITH THE ARCHITECT AND ENGINEER PRIOR TO FABRICATION AND EXECUTION OF THE WORKS

RIBA STAGE 3

ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

P01	STAGE 3	03.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:



Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project:

**VIADUX PHASE II,
MANCHESTER**

Drawing Title:

**ABUTMENT OPENING
TYPE 2 SECTIONS (SHEET 2)**

Status:

RIBA STAGE 3

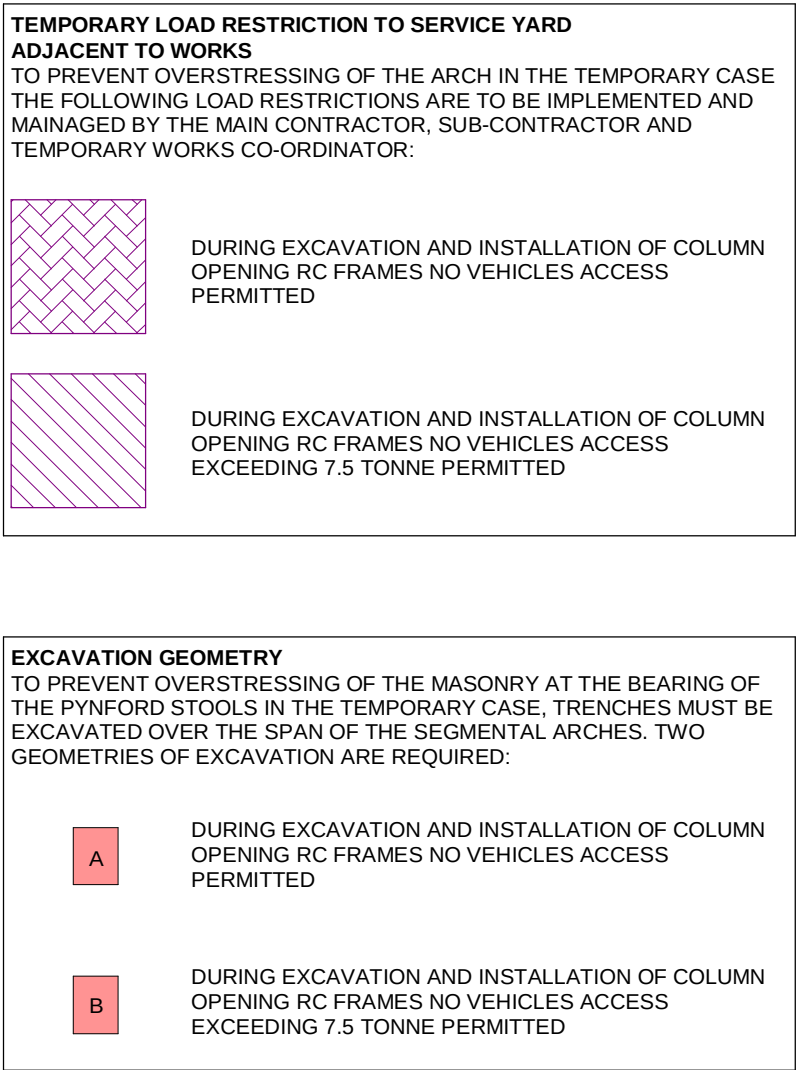
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	03.11.21	GR	GR	KG

Scale:	1:20	Project No:	2102-09				
Project:	Originator:	Volume:	Level:	Type:	Rate:	Category/Number:	Rev:

VI2-REN-AA-ZZ-DR-S-03261-P01

APPENDIX C

ARCH PENETRATION DRAWINGS



- NOTES:**
1. REFER TO DRAWING VIA-REN-A-XX-DR-S-00010 FOR GENERAL NOTES.
 2. REFER TO VIA-REN-00-XX-DR-S-00015 FOR ALL STRUCTURAL ELEMENT SCHEDULES.
 3. ALL CONCRETE WORKS TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL STRUCTURAL CONCRETE SPECIFICATION AND RENAISSANCE CONCRETE SPECIFICATION.
 4. WHERE FEASIBLE EXISTING GOOD QUALITY MASONRY UNITS ARE TO BE SALVAGED AND CLEANED FOR REUSE WITHIN THE WORKS.
 5. WHERE NEW BRICKS ARE REQUIRED THAT ARE NOT EXPOSED IN THE FINISHED WORKS THESE ARE TO BE SOLID CLASS B CLAY ENGINEERING BRICKS. ALL EXPOSED MASONRY TO BE SUITABLY SOURCED TO MATCH EXISTING.
 6. NO CEMENT BASED MORTAR IS PERMITTED FOR USE WITHIN REINSTATEMENT WORKS OF MASONRY. ALL NEW AND REPAIR WORKS UNDERTAKEN ARE TO BE WITH A LIME MORTAR:
HLM 3.5 - GENERAL MASONRY WORKS 150mm ABOVE GROUND LEVEL
HLM 5.0 - WORKS BELOW GROUND
 7. ALL TEMPORARY WORKS TO CONTRACTORS DESIGN AND DETAIL.

GENERAL ARCH MAINTENANCE & REPAIR WORKS

REFER TO RENAISSANCE 'VIADUCT STRUCTURAL REPORT'
(VIA-REN-B-XX-RP-S-00010) FOR EXISTING SURVEY INFORMATION
AND RECOMMENDATIONS FOR REMEDIATION AND REPAIR WORKS

NOTE: BELOW GROUND DRAINAGE HAS BEEN OMITTED FOR CLARITY
REFER TO RENAISSANCE DRAWINGS
CIS-REN-0-01-DR-C-01101 AND
CIS-REN-0-01-DR-C-01102 FOR DETAILS

HEALTH AND SAFETY NOTES:

IN ADDITION TO THE HAZARDS AND RISKS NORMALLY ASSOCIATED WITH WORKS OF THIS NATURE, NOTE THE FOLLOWING ABNORMAL RISKS IDENTIFIED

TEMPORARY PROPPING OF ARCHES

TO MAINTAIN STABILITY OF THE ARCHES DURING THE CONSTRUCTION WORKS TEMPORARY PROPPING IS REQUIRED. REFER TO DRAWING SERIES VIA-REN-0-ZZ-DR-S-9020 FOR OUTLINE CONSTRUCTION METHODOLOGY FOR FORMING COLUMN AND CORE ARCH PENETRATIONS DETAILS OF PROPPING AND FINAL SEQUENCING OF WORKS TO BE TO TEMPORARY WORKS DESIGNERS DESIGN AND DETAILS. MONITORING OF WORKS BY PRINCIPAL CONTRACTORS TEMPORARY WORKS CO-ORDINATOR.

SERVICE YARD LOADING RESTRICTIONS FOR TEMPORARY WORKS

ASSUME THAT LOADING ON THE ARCH IS TO BE LIMITED A MAXIMUM UDL = 10kN/m2 AND THAT GROSS VEHICLE WEIGHTS ARE LIMITED TO 20 TONNE, WITH A MAXIMUM AXLE LOAD OF 8 TONNE AND WHEEL LOAD OF 5 TONNE. THE ALLOWABLE LOADINGS ARE TO BE CONFIRMED BY THE STRUCTURAL WORKS ENGINEER. THIS CASE IS ON A CASE BASIS AND ARE SUBJECT TO DETAILED ANALYSIS TO DEMONSTRATE THAT THE ARCHES WILL NOT BE OVERSTRESSED. ALL EXCAVATED MATERIAL IS TO BE REMOVED FROM THE SERVICE YARD LEVEL IN THE TEMPORARY CASE AND STOCKPILING IS NOT PERMITTED. THE CONTRACTOR IS TO ALLOW FOR UNDERTAKING THE WORKS USING SUITABLE PLANT TO ENSURE THAT THE VIADUCT STRUCTURE IS NOT OVERLOADED.

PROTECTION MEASURES TO GRADE II

LISTED VIADUCT & APPROVALS

THE CONTRACTOR IS TO PROVIDE PROTECTION MEASURES TO THE VIADUCT MASONRY STRUCTURE IN THE TEMPORARY CASE.

ALL TEMPORARY WORKS ARE TO BE DESIGNED TO MINIMISE FIXING TO THE EXISTING LISTED BUILDING, WHERE INTRUSIVE CONNECTIONS OR ALTERATIONS ARE REQUIRED THESE ARE TO BE AGREED IN WRITING BY THE LISTED BUILDING OFFICER. THE PRINCIPAL CONTRACTORS TEMPORARY WORKS CO-ORDINATOR IS TO ALLOW SUFFICIENT TIME WITHIN THEIR PROGRAMME FOR OBTAINING LISTED BUILDING CONSENT IF REQUIRED.

C02	TO INCORPORATE CAT 3 COMMENTS	02.08.21	SS	GR
C01	STAGE 5 ISSUE	06.07.21	RW	GR
Rev:	Description:	Date:	By:	Chkd:



Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HQ

Project:

VIADUCT,
MANCHESTER

Drawing Title:

ZONE A-VIADUCT
PENETRATION PLAN

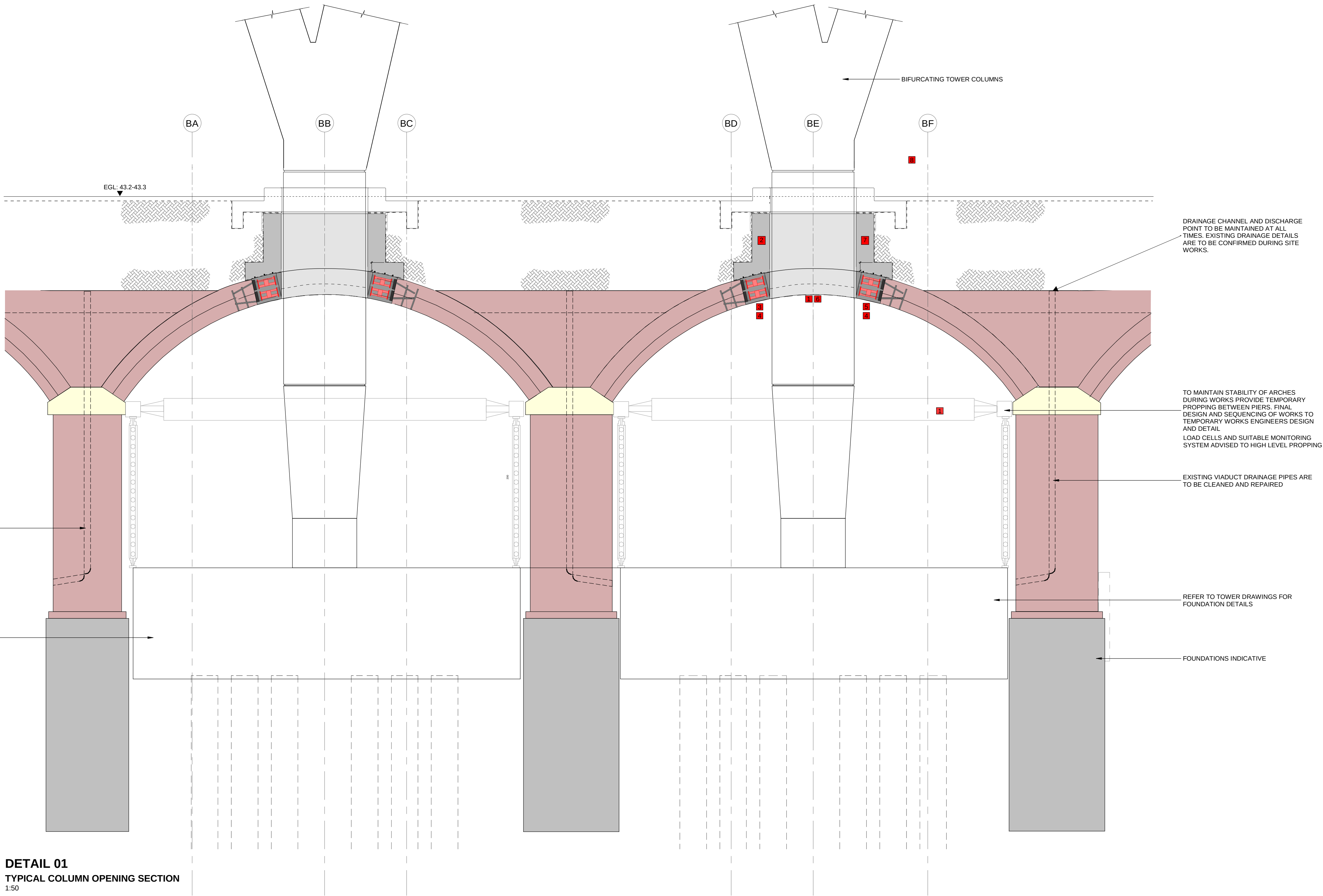
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STAGE 5

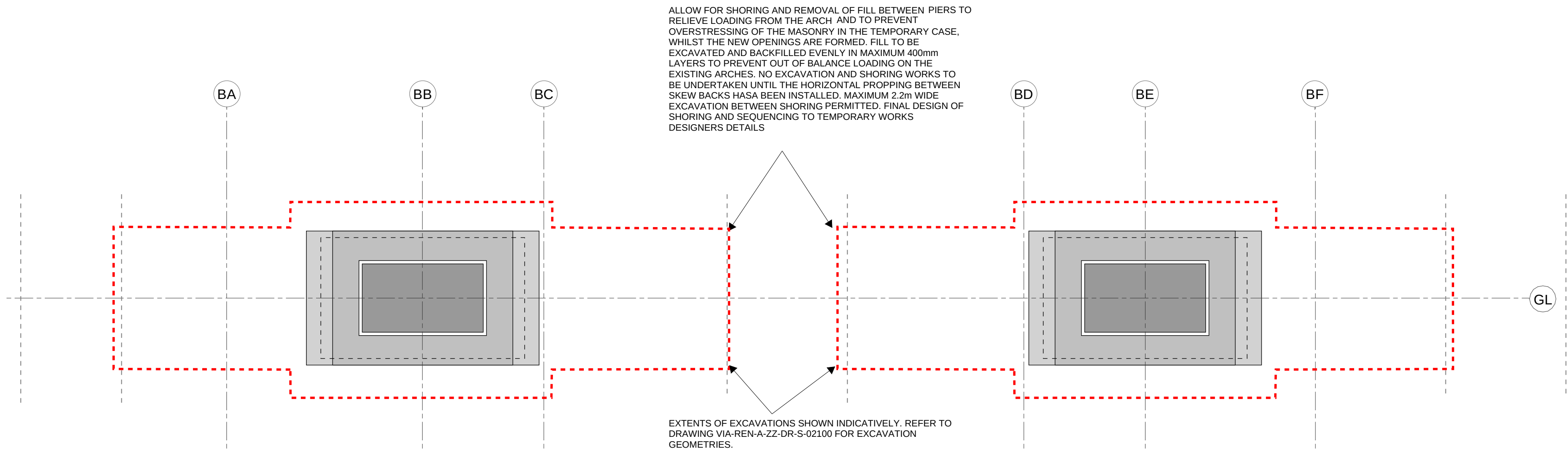
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	JUL'21	MR	RW	GR

Scale: 1 : 100			Project No: 1910-12				
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:

VIA-REN-A-ZZ-DR-S-02100-C02



DETAIL 01
TYPICAL COLUMN OPENING SECTION
1:50



TYPICAL COLUMN OPENING PLAN
1:50

NOTES:

1. REFER TO DRAWINGS VIA-REN-A-XX-DR-S-00010 AND VIA-REN-A-ZZ-DR-S-02100 FOR NOTES.

WATERPROOFING
ALLOW FOR ALL NEW RC STRUCTURAL ELEMENTS TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING TO MAINTAIN CONTINUITY OF THE EXISTING ASPHALT WATERPROOFING OVER THE ARCHES. ALL WATERPROOFING, INCLUDING LAPPING TO EXISTING ASPHALT IS TO BE TO SPECIALIST MANUFACTURERS DESIGN AND DETAILS. IT IS RECOMMENDED THAT A WATERPROOFING SPECIALIST IS APPOINTED TO ALLOW CO-ORDINATION OF THE WATERPROOFING WITH THE PROPOSED STRUCTURAL WORKS.

CORING WORKS TO ARCHES
ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALISTS TO ALLOW THE CORING TECHNIQUES TO BE AGREED AND REQUIREMENTS ON OPENING SIZES TO BE INCORPORATED METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS

- OUTLINE CONSTRUCTION METHODOLOGY**
- STAGE ACTIVITY**
1. INSTALL PROPPING BETWEEN SKEWBACKS AND TO UNDERSIDE OF ARCH BENEATH PROPOSED OPENING LOCATION.
 2. EXCAVATE FILL TO EXPOSE TOP OF ARCHES. ARCH OPENING EXCAVATIONS TO BE FORMED USING TRENCH BOXES TO MINIMISE EXCAVATION AND REMOVAL OF DEAD LOAD FROM ARCHES. EXCAVATION WITHIN TRENCH BOXES TO BE UNDERTAKEN IN 400mm INCREMENTS FOR FULL EXTENT OF TRENCH BOXES.
 3. CAREFULLY CUT OUT POCKETS AND INSTALL FIRST ROW OF STOOLS, GROUT END. DO NOT PROGRESS TO NEXT STAGE UNTIL THE GROUT ACHIEVES A MINIMUM 30N/mm² COMPRESSIVE STRENGTH.
 4. REPEAT THE ABOVE TO INSTALL SECOND ROW OF STOOLS. DO NOT PROGRESS TO NEXT STAGE UNTIL THE GROUT ACHIEVES A MINIMUM 30N/mm² COMPRESSIVE STRENGTH.
 5. CAREFULLY CUT OUT BRICKWORK TO ALLOW FORMATION OF RING BEAM. INSTALL REINFORCEMENT AND PLACE CONCRETE. DO NOT PROGRESS TO NEXT STAGE UNTIL THE REINFORCED CONCRETE RING BEAM ACHIEVES A MINIMUM COMPRESSIVE STRENGTH. TO BE CONFIRMED BY TEMPORARY WORKS ENGINEER
 6. REMOVE REMAINING MASONRY TO NEW OPENING AND INSTALL TEMPORARY WORKING PLATFORM.
 7. INSTALL RC COLLAR BEAMS AND WATERPROOFING.
 8. BACKFILL WHERE REQUIRED. LEVELS TO BE BROUGHT UP IN MAXIMUM 400mm AND COMPACTED WITH A NON-PERCUSSIVE TECHNIQUE. REMOVE TRENCH BOXES AS WORKS PROGRESS.

THE ABOVE METHODOLOGY IS TO BE READ IN CONJUNCTION WITH DRAWING SERIES VIA-REN-0-ZZ-DR-S-90020.

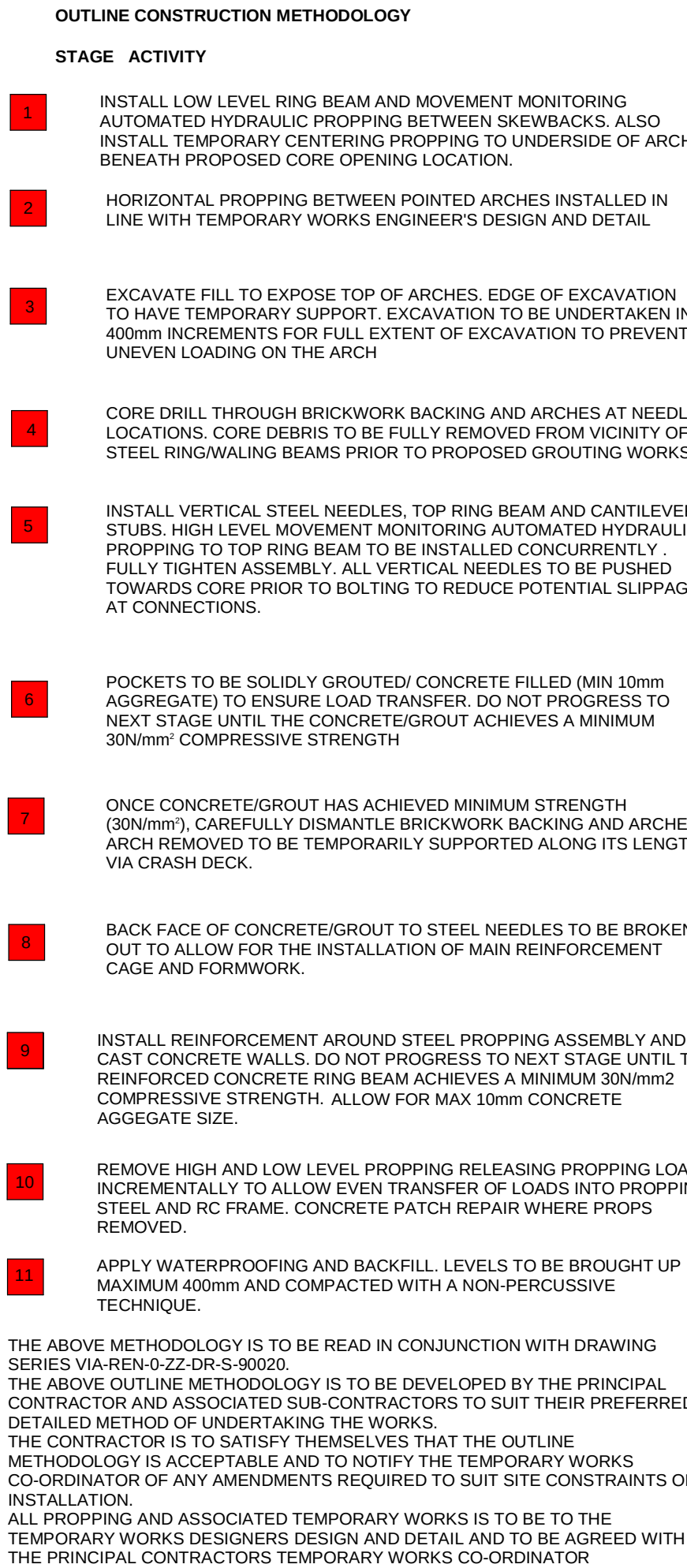
THE ABOVE OUTLINE METHODOLOGY IS TO BE DEVELOPED BY THE PRINCIPAL CONTRACTOR AND ASSOCIATED SUB-CONTRACTORS TO SUIT THEIR PREFERRED DETAILED METHOD OF UNDERTAKING THE WORKS.

THE CONTRACTOR IS TO SATISFY THEMSELVES THAT THE OUTLINE METHODOLOGY IS ACCEPTABLE AND TO NOTIFY THE TEMPORARY WORKS CO-ORDINATOR OF ANY AMENDMENTS REQUIRED TO SUIT SITE CONSTRAINTS OR INSTALLATION.

ALL PROPPING AND ASSOCIATED TEMPORARY WORKS IS TO BE TO THE TEMPORARY WORKS DESIGNERS DESIGN AND DETAIL AND TO BE AGREED WITH THE PRINCIPAL CONTRACTORS TEMPORARY WORKS CO-ORDINATOR.

C01	STAGE 5 ISSUE	06.07.21	RW	GR
Rev:	Description:	Date:	By:	Chkd:
 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project: VIADUCT, MANCHESTER				
Drawing Title: ZONE A-TYPICAL MC1 COLUMN TYPE PENETRATION				
Status: STAGE 5				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	JUL'21	MR	RW	GR
Scale:	As indicated	Project No:	1910-12	
Project:	Originator:	Volume:	Level:	Type:
			Role:	Category/Number:
				Rev:

VIA-REN-A-ZZ-DR-S-02250-C01



C01	STAGE 5 ISSUE	06.07.21		RW	GR
Rev:	Description:	Date:	By:	Chkd:	
		Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG			
Project:					
VIADUCT, MANCHESTER					
Drawing Title:					
VIADUCT CORE AND MC2 COLUMN TYPE PENETRATION SECTION					
Status:					
STAGE 5					
Size:	Date:	Drawn by:	Designed by:	Checked by:	
A1	JUL'21	MR	GR	PC	
Scale:	Project No:		1910-12		
Project:	Originator:	Volume:	Level:	Type:	Category/Number: Rev:

VIA-REN-A-ZZ-DR-S-02251-C01



1. REFER TO DRAWINGS VIA-REN-A-XX-DR-S-00010 AND VIA-REN-A-ZZ-DR-S-02100 FOR NOTES.

SURVEY WORKS ARE REQUIRED TO THE SERVICE YARD TO CONFIRM THE PROFILE TO THE TOP OF THE ARCHES, FORM OF BACKING CONSTRUCTION, AND FILL PROPERTIES. THIS WILL INFORM THE TECHNICAL DESIGN AND FINAL CONSTRUCTION DETAILS. UNTIL THE SURVEY WORKS HAVE BEEN COMPLETED AND REVIEWED THE DRAWINGS SHOULD BE CONSIDERED TO BE INDICATIVE ONLY AND A SUITABLE RISK ALLOWANCE INCLUDED WITHIN THE TENDER.

ALLOW FOR ALL THE NEW RC STRUCTURE TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING TO MAINTAIN CONTINUITY OF THE EXISTING ASPHALT WATERPROOFING OVER THE ARCHES.

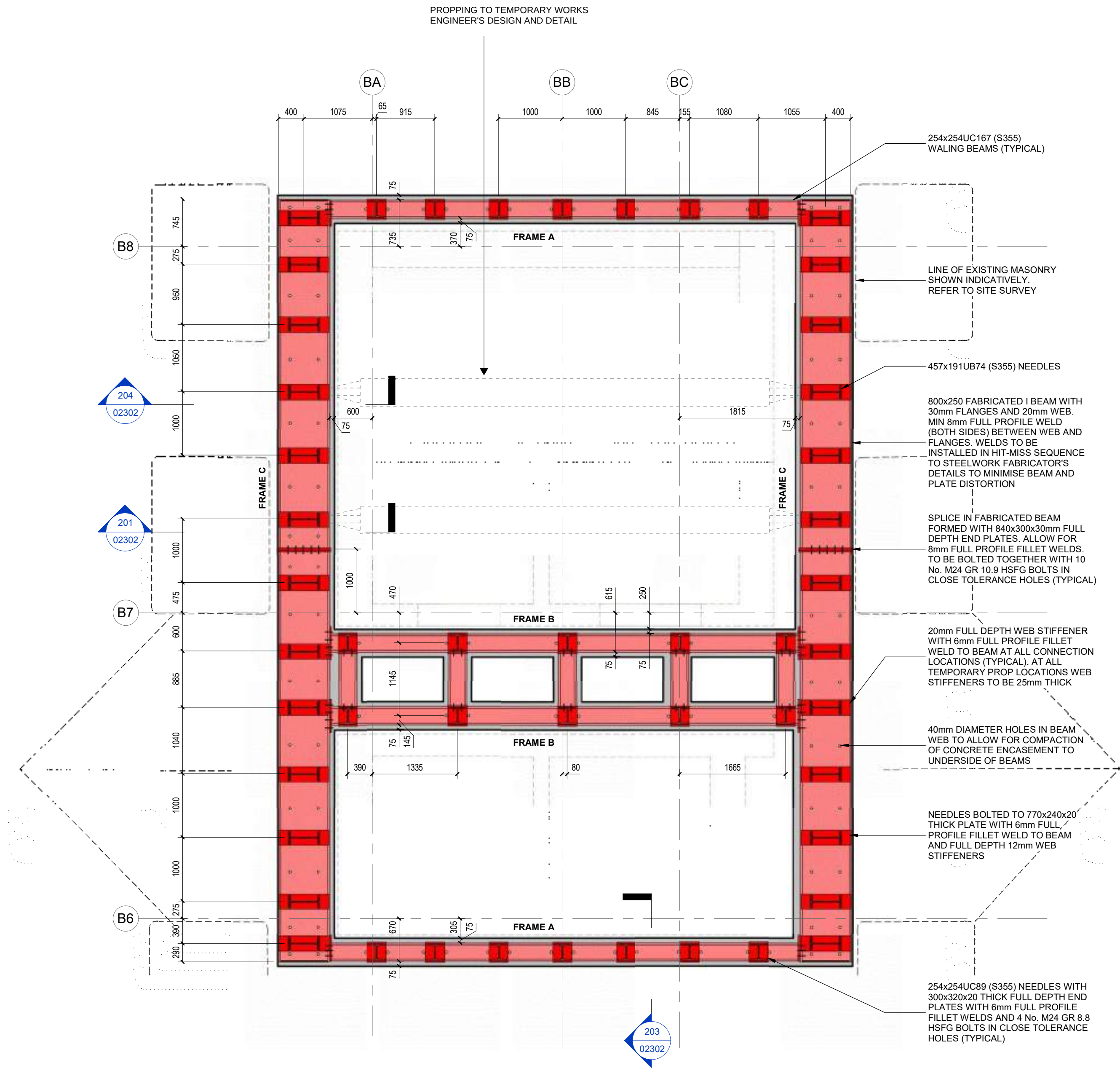
ALL WATERPROOFING, INCLUDING LAPPING TO EXISTING ASPHALT IS TO BE TO SPECIALIST MANUFACTURERS DESIGN AND DETAILS. IT IS RECOMMENDED THAT A WATERPROOFING SPECIALIST IS APPOINTED AT THE BEGINNING OF RIBA STAGE 4 TO ALLOW CO-ORDINATION OF THE WATERPROOFING WITH THE PROPOSED STRUCTURAL WORKS.

ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALISTS TO ALLOW THE CORING TECHNIQUES TO BE AGREED AND REQUIREMENTS ON OPENING SIZES TO BE INCORPORATED INTO THE STAGE 4 TECHNICAL DESIGN. METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS.

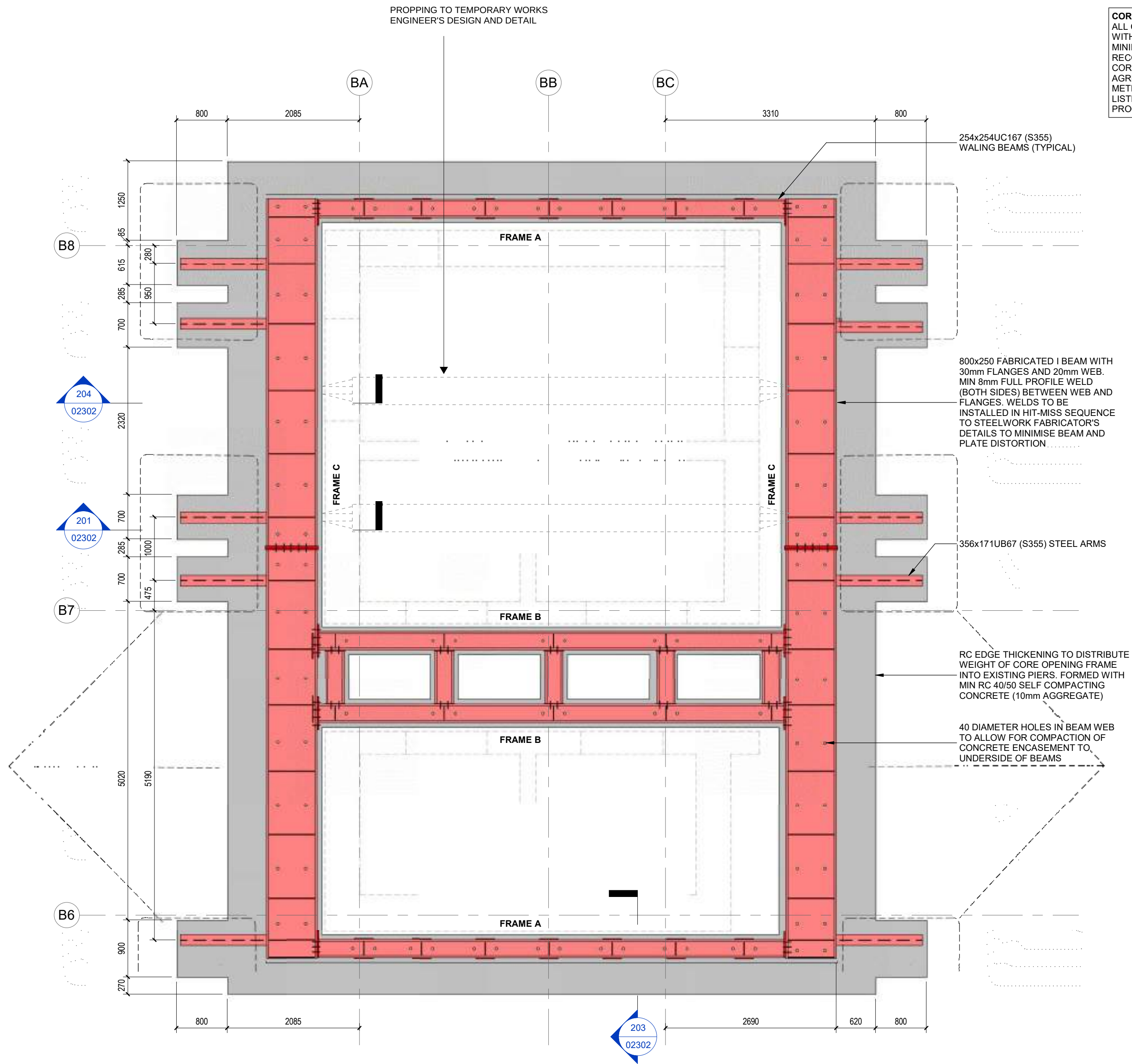


01	STAGE 5 ISSUE	06.07.21	RW	GR			
Rev:	Description:	Date:	By:	Chk:			
		Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG					
Project:							
VIADUX, MANCHESTER							
Drawing Title:							
ZONE A- MC2 PENETRATION DETAIL							
Status:							
RIBA STAGE 5							
Size:	Date:	Drawn by:	Designed by:	Checked by:			
A1	JUL'21	RW	GR	PC			
Scale:	1:20 @ A1 U.N.O.	Project No:	1910-12				
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:
VIA-REN-A-ZZ-DR-S-02305-C01							

- NOTES:**
- REFER TO DRAWINGS VIA-REN-A-XX-DR-S-00010 AND VIA-REN-A-ZZ-DR-S-02100 FOR NOTES.
- WATERPROOFING**
ALLOW FOR ALL THE NEW RC STRUCTURAL ELEMENTS TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING TO MAINTAIN CONTINUITY OF THE ASPHALT WATERPROOFING OVER THE ARCHES. ALL WATERPROOFING, INCLUDING LAPPING TO EXISTING ASPHALT IS TO BE TO SPECIALIST MANUFACTURERS DESIGN AND DETAILS. IT IS RECOMMENDED THAT A WATERPROOFING SPECIALIST IS APPOINTED TO ALLOW CO-ORDINATION OF THE WATERPROOFING WITH THE PROPOSED STRUCTURAL WORKS.
- CORING WORKS TO ARCHES**
ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALISTS TO ALLOW THE CORING TECHNIQUES TO BE AGREED AND REQUIREMENTS ON OPENING SIZES TO BE INCORPORATED. METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS.



LOW LEVEL RING BEAM PLAN
SCALE: 1 : 50



HIGH LEVEL RING BEAM PLAN
SCALE: 1 : 50

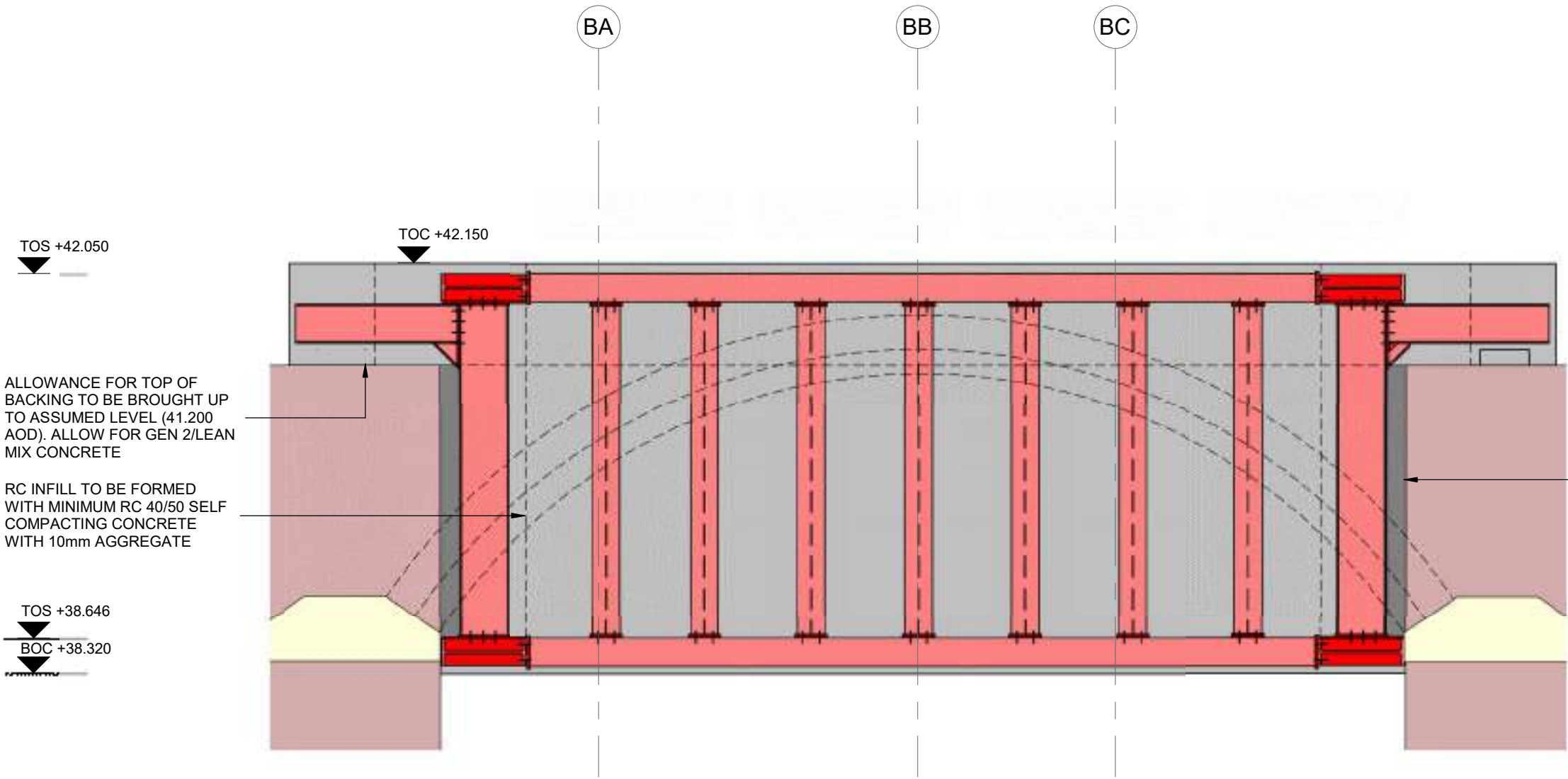
C01	STAGE 5	19.07.21	JM	GR
Rev:	Description:	Date:	By:	Chkd:
 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project: VIADUCT, MANCHESTER				
Drawing Title: VIADUCT CORE PENETRATION DETAILS SHEET 1				
Status: STAGE 5				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	JUL'21	CP	GR	PC
Scale:	AS SHOWN	Project No:	1910-12	
Project:	Originator:	Volume:	Level:	Type: Role: Category/Number: Rev:
VIA-REN-A-ZZ-DR-S-02301-C01				

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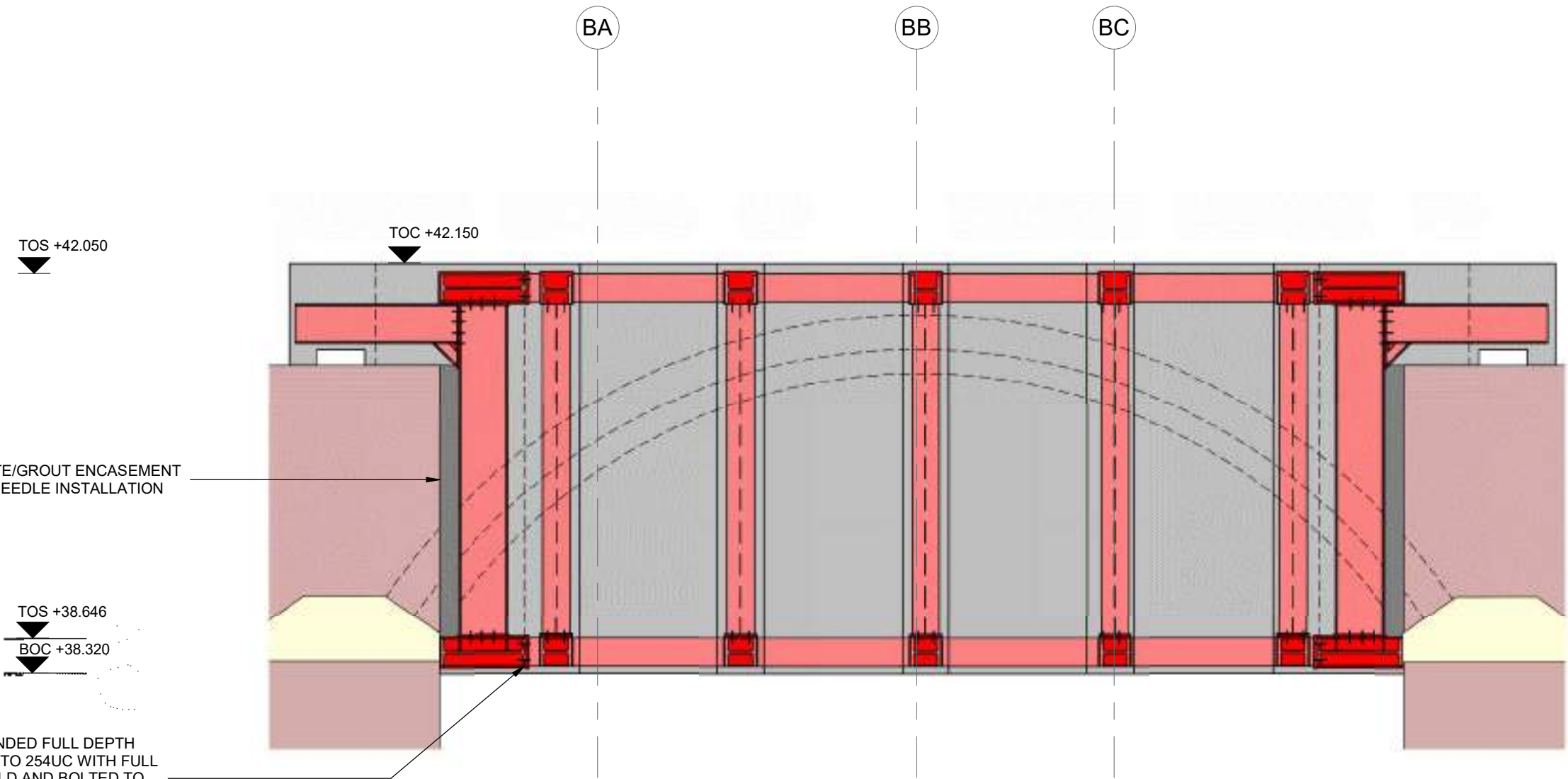
1. REFER TO DRAWINGS VIA-REN-A-XX-DR-S-00010 AND VIA-REN-A-ZZ-DR-S-02100 FOR NOTES.

WATERPROOFING
ALLOW FOR ALL THE NEW RC STRUCTURAL ELEMENTS TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING TO MAINTAIN CONTINUITY OF THE ASPHALT WATERPROOFING OVER THE ARCHES. ALL WATERPROOFING, INCLUDING LAPPING TO EXISTING ASPHALT IS TO BE TO SPECIALIST MANUFACTURERS DESIGN AND DETAILS. IT IS RECOMMENDED THAT A WATERPROOFING SPECIALIST IS APPOINTED TO ALLOW CO-ORDINATION OF THE WATERPROOFING WITH THE PROPOSED STRUCTURAL WORKS.

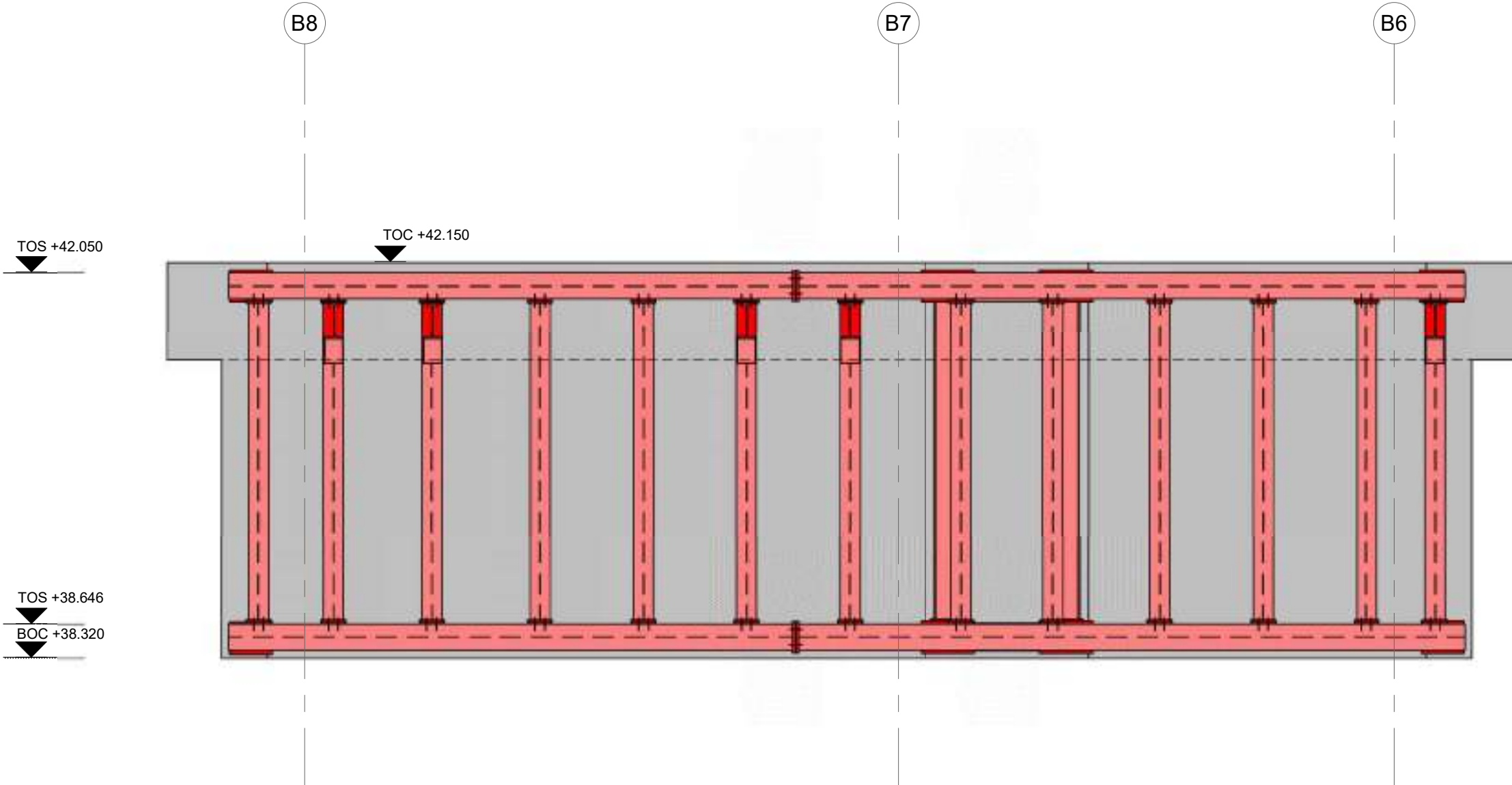
CORING WORKS TO ARCHES
ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALISTS TO ALLOW THE CORING TECHNIQUES TO BE AGREED AND REQUIREMENTS ON OPENING SIZES TO BE INCORPORATED. METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS.



FRAME A ELEVATION
SCALE: 1 : 50



FRAME B ELEVATION
SCALE: 1 : 50

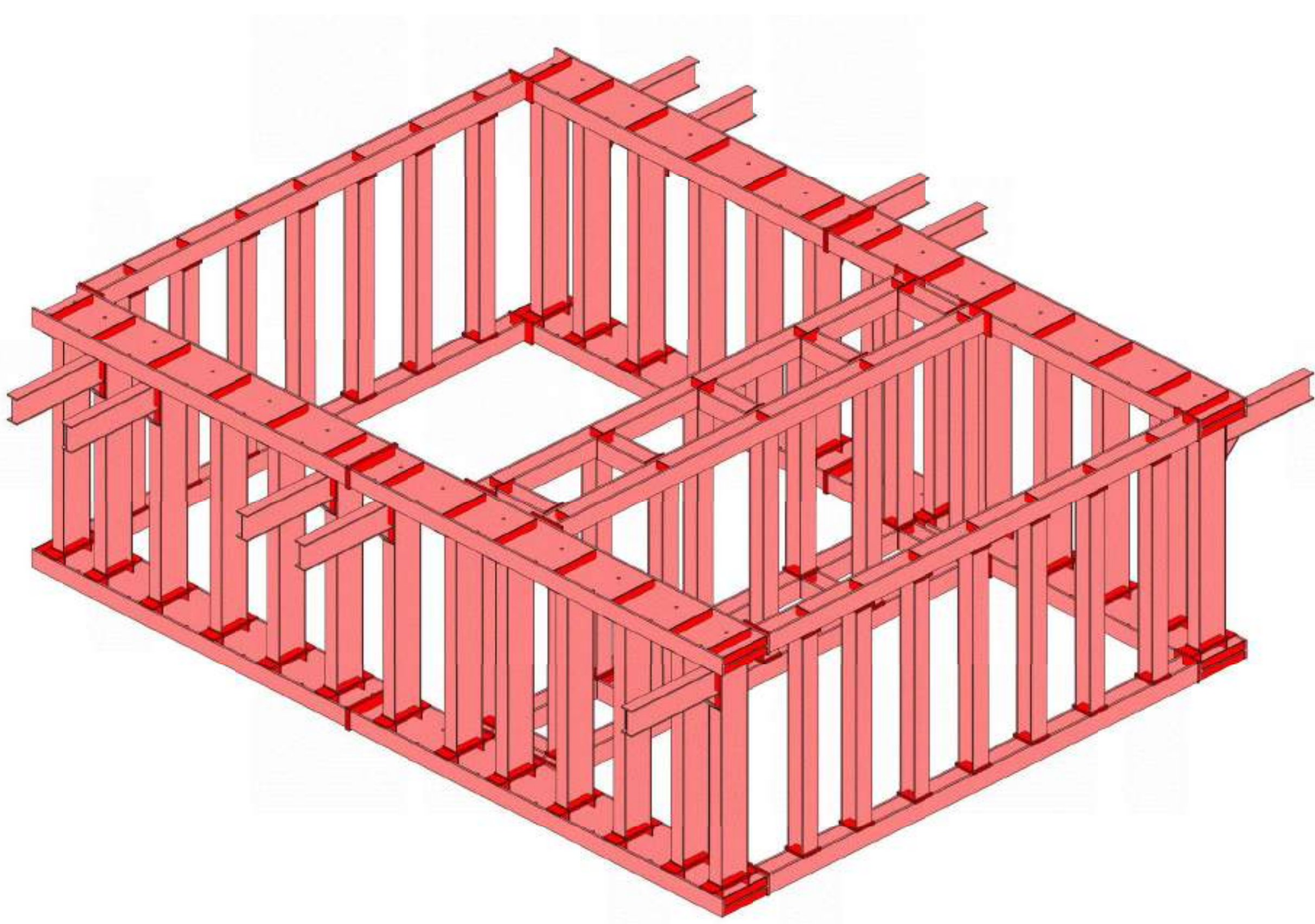


FRAME C ELEVATION
SCALE: 1 : 50

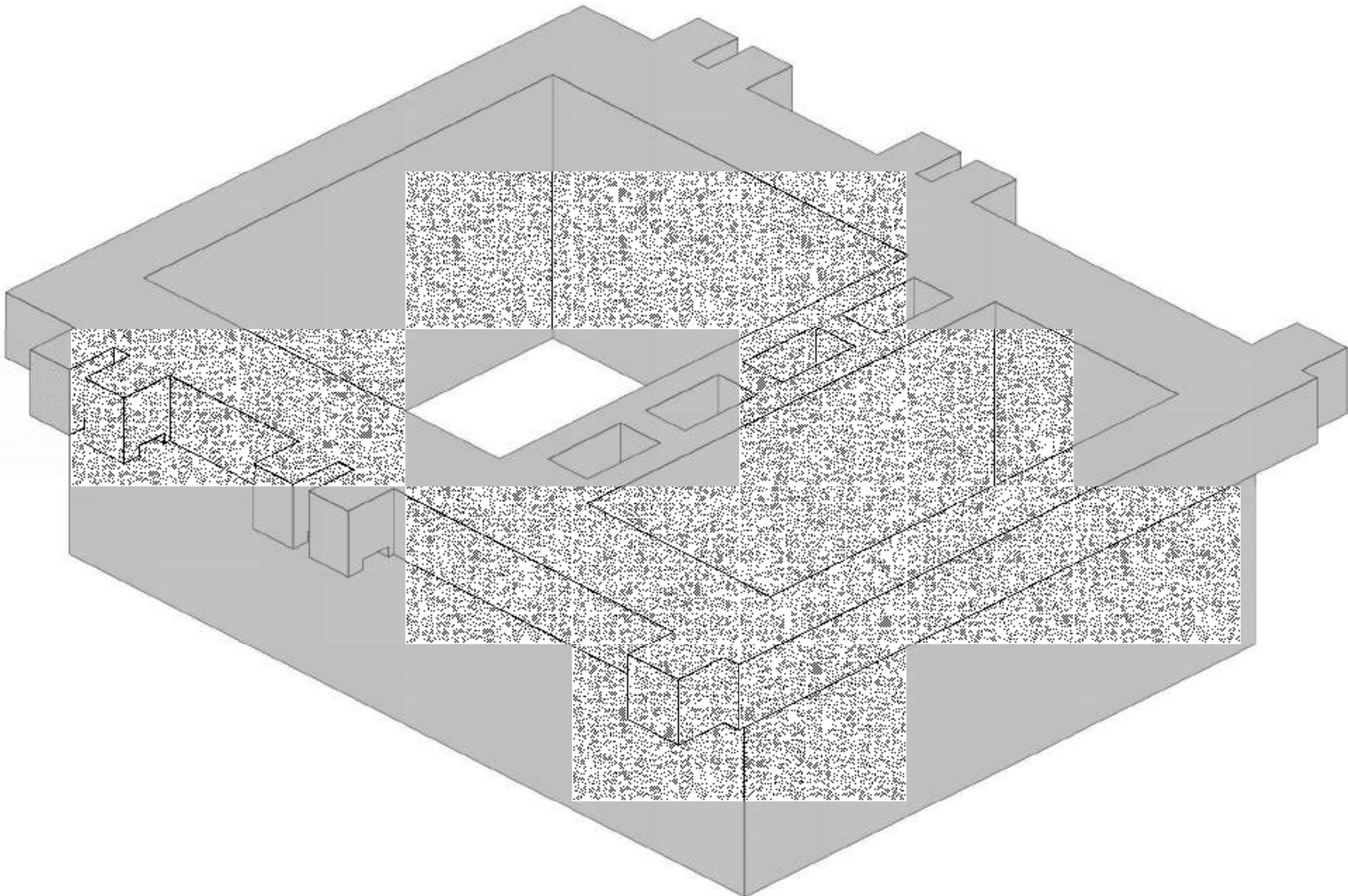
C01	STAGE 5	19.07.21	JM	GR
Rev:	Description:	Date:	By:	Chkd:
renaissance Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project: VIADUCT, MANCHESTER				
Drawing Title: VIADUCT CORE PENETRATION DETAILS SHEET 2				
Status: STAGE 5				
Size: A1	Date: JUL'21	Drawn by: CP	Designed by: GR	Checked by: PC
Scale: AS SHOWN	Project No: 1910-12			
Project:	Originator:	Volume:	Level:	Type: Role: Category/Number: Rev:

VIA-REN-A-ZZ-DR-S-02302-C01

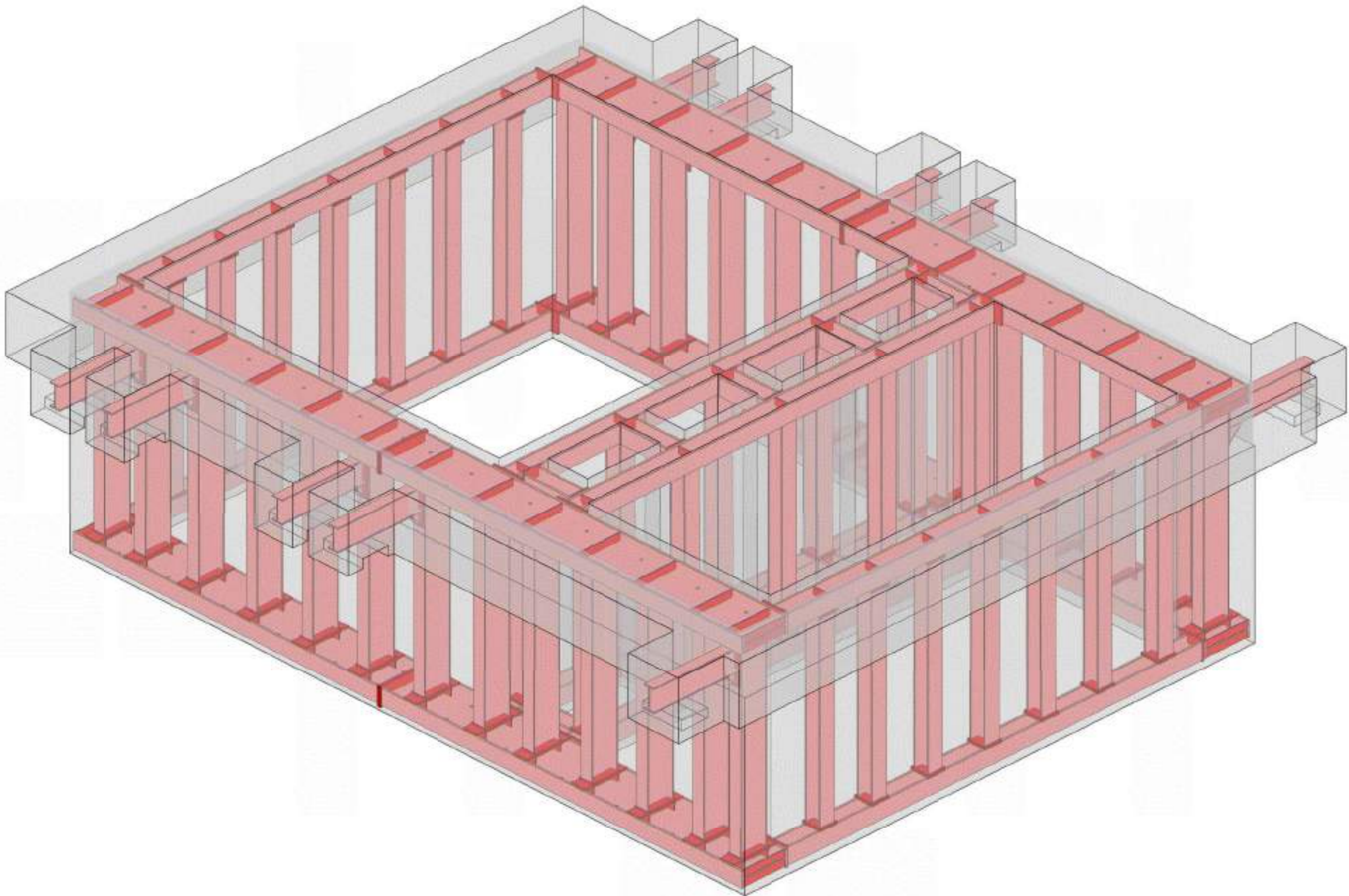
NOTES:
1. REFER TO DRAWINGS VIA-REN-A-XX-DR-S-00010 AND VIA-REN-A-ZZ-DR-S-02100 FOR NOTES.



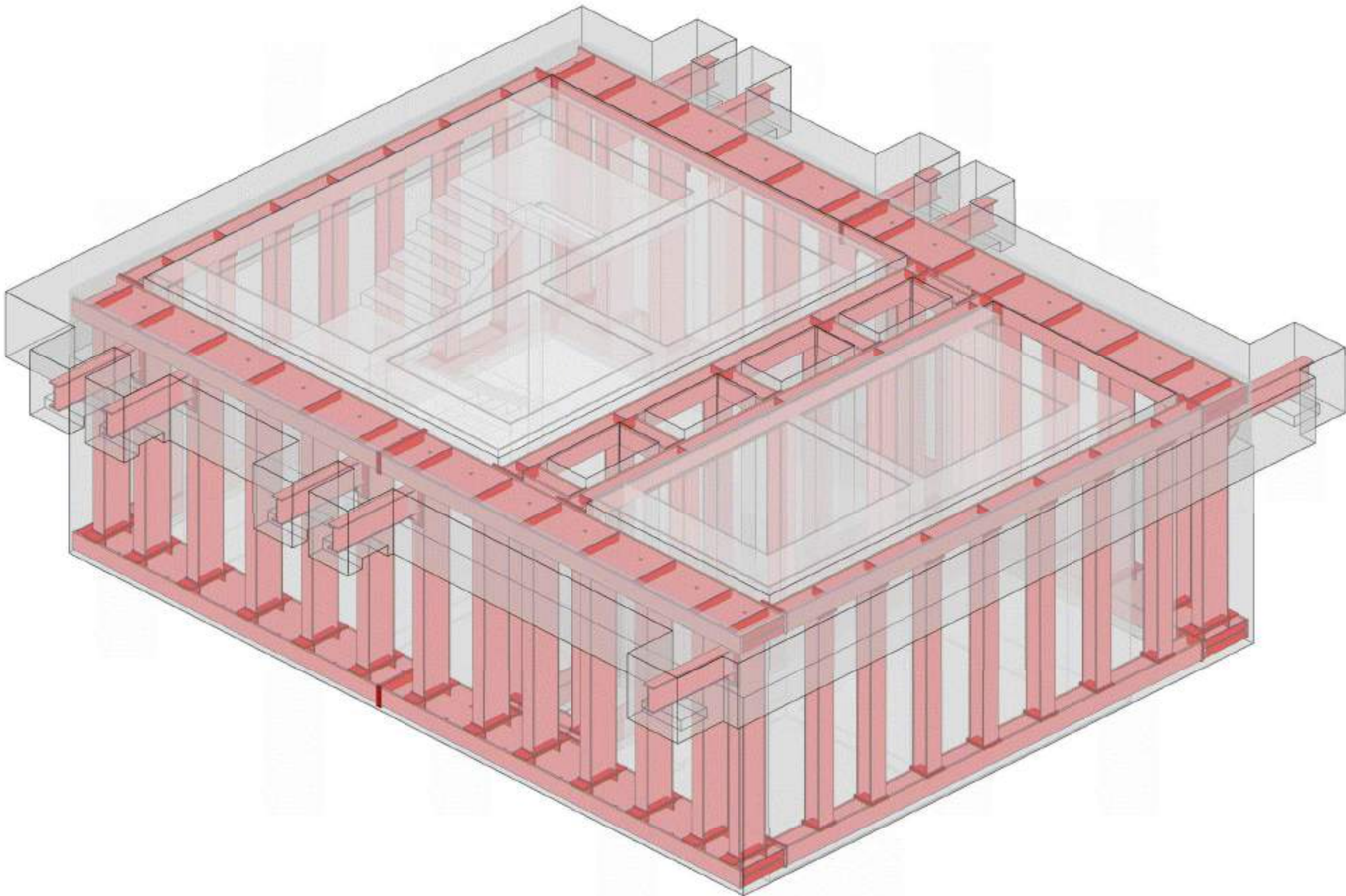
CORE FRAMING 3D VIEW 1
SCALE: NTS



CORE FRAMING 3D VIEW 2
SCALE: NTS



CORE FRAMING 3D VIEW 3
SCALE: NTS



CORE FRAMING OVERLAY 3D VIEW
SCALE: NTS

C01	STAGE 5	19.07.21	JM	GR
Rev:	Description:	Date:	By:	Chkd:



Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project:
**VIADUCT,
MANCHESTER**

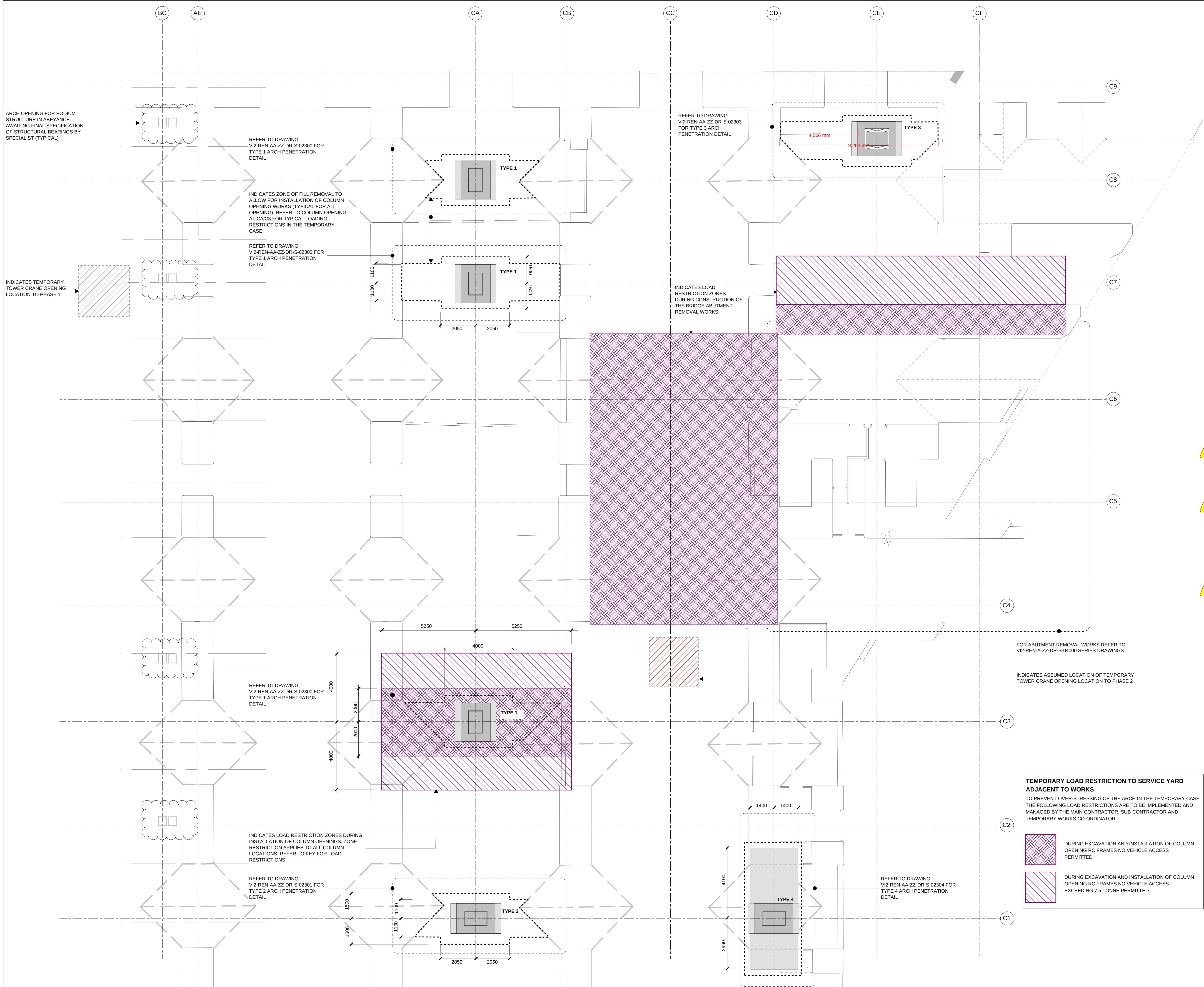
Drawing Title:
**VIADUCT CORE
PENETRATION ISOMETRICS**

Status:
STAGE 5

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	JUL'21	CP	GR	PC

Scale: AS SHOWN			Project No: 1910-12				
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:

VIA-REN-A-ZZ-DR-S-02310-C01



- GENERAL NOTES:**
- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - ALL CONCRETE WORKS TO BE EXECUTED IN ACCORDANCE WITH THE LATEST EDITION OF THE 'NATIONAL STRUCTURAL CONCRETE SPECIFICATION' AND RENAISSANCE PROJECT CONCRETE SPECIFICATION.
 - CONCRETE TO GENERALLY BE RC40/50 AIR ENTRAINED.
 - WHERE FEASIBLE EXISTING GOOD QUALITY MASONRY UNITS ARE TO BE SALVAGED AND CLEANED FOR REUSE WITHIN THE WORKS.
 - WHERE NEW BRICKS ARE REQUIRED THAT ARE NOT EXPOSED IN THE FINISHED WORKS THESE ARE TO BE SOLID CLASS 8 CLAY ENGINEERING BRICKS. ALL EXPOSED MASONRY TO BE SUITABLY SOURCED TO MATCH EXISTING.
 - NO CEMENT BASED MORTAR IS PERMITTED FOR USE WITHIN REINSTATEMENT WORKS OF MASONRY. ALLOW FOR NEW AND REPAIR WORKS UNDERTAKEN TO BE WITH A LIME MORTAR:
HLM 3.5 - GENERAL MASONRY WORKS 150mm ABOVE GROUND LEVEL
HLM 5.0 - WORKS BELOW GROUND
FINAL MORTAR SPECIFICATION TO BE IN ACCORDANCE WITH THE HERITAGE ARCHITECTS SPECIFICATION AND SUBJECT TO AGREEMENT WITH THE ENGINEER.

GENERAL ARCH MAINTENANCE & REPAIR WORKS
REFER TO RENAISSANCE VIADUCT STRUCTURAL REPORT (VIA-REN-B-XX-RP-00010) FOR EXISTING SURVEY INFORMATION AND RECOMMENDATIONS FOR REMEDIAL AND REPAIR WORKS

RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

NOTE: BELOW GROUND DRAINAGE HAS BEEN OMITTED FOR CLARITY. REFER TO RENAISSANCE DRAWINGS

- HEALTH & SAFETY NOTES:**
- IN ADDITION TO THE NORMAL RISKS, A COMPETENT CONTRACTOR EXPERIENCED IN THIS TYPE OF WORK WOULD BE EXPECTED TO BE AWARE OF, THE FOLLOWING ABNORMAL AND RESIDUAL RISKS FROM THE DESIGN SHOULD BE NOTED AND MANAGED BY THE CONTRACTOR.
- 1** **TEMPORARY PROPPING OF ARCHES:** TO MAINTAIN STABILITY OF THE ARCHES DURING THE CONSTRUCTION WORKS TEMPORARY PROPPING IS REQUIRED. REFER TO DRAWING SERIES VI2-REN-AA-ZZ-DR-S-92000 FOR OUTLINE CONSTRUCTION METHODOLOGY FOR FORMING COLUMN ARCH PENETRATIONS. DETAILS OF PROPPING AND FINAL SEQUENCING OF WORKS TO BE TO TEMPORARY WORKS ENGINEERS DESIGN AND DETAILS. MONITORING OF WORKS BY PRINCIPAL CONTRACTORS TEMPORARY WORKS CO-ORDINATOR.
- 2** **SERVICE YARD LOADING RESTRICTIONS FOR TEMPORARY WORKS:** AT THIS STAGE ASSUME THAT THE LOADING ON THE ARCH IS TO BE LIMITED TO A MAXIMUM UDL - 10kN/m² AND THAT GROSS VEHICLE WEIGHTS ARE LIMITED TO 20 TONNES, WITH A MAXIMUM AXLE LOAD OF 8 TONNES AND WHEEL LOAD OF 5 TONNES. THE ALLOWABLE LOADINGS ARE TO BE CONFIRMED BY THE TEMPORARY WORKS DESIGNERS ON A CASE BY CASE BASIS AND ARE SUBJECT TO DETAILED ANALYSIS TO DEMONSTRATE THAT THE ARCHES WILL NOT BE OVERSTRESSED. ALL EXCAVATED MATERIAL IS TO BE REMOVED FROM THE SERVICE YARD LEVEL. IN THE TEMPORARY CASE AND STOCKPILING IS NOT PERMITTED. THE CONTRACTOR IS TO ALLOW FOR UNDERTAKING THE WORKS USING SUITABLE PLANT TO ENSURE THAT THE VIADUCT STRUCTURE IS NOT OVERLOADED.
- 3** **PROTECTION MEASURES TO GRADE II LISTED VIADUCT & APPROVALS:** THE CONTRACTOR IS TO PROVIDE PROTECTION MEASURES TO THE VIADUCT MASONRY STRUCTURE IN THE TEMPORARY CASE. ALL TEMPORARY WORKS ARE TO BE DESIGNED TO MINIMISE FIXING TO THE EXISTING LISTED STRUCTURE. WHERE INTRUSIVE CONNECTIONS OR ALTERATIONS ARE REQUIRED THESE ARE TO BE AGREED IN WRITING BY THE LISTED BUILDING OFFICER. THE PRINCIPAL CONTRACTOR'S TEMPORARY WORKS CO-ORDINATOR IS TO ALLOW SUFFICIENT TIME WITHIN THEIR PROGRAMME FOR OBTAINING LISTED BUILDING CONSENT IF REQUIRED.

TEMPORARY LOAD RESTRICTION TO SERVICE YARD ADJACENT TO WORKS

TO PREVENT OVER-STRESSING OF THE ARCH IN THE TEMPORARY CASE THE FOLLOWING LOAD RESTRICTIONS ARE TO BE IMPLEMENTED AND MANAGED BY THE MAIN CONTRACTOR, SUB-CONTRACTOR AND TEMPORARY WORKS CO-ORDINATOR:

-  DURING EXCAVATION AND INSTALLATION OF COLUMN OPENING RC FRAMES NO VEHICLE ACCESS PERMITTED
-  DURING EXCAVATION AND INSTALLATION OF COLUMN OPENING RC FRAMES NO VEHICLE ACCESS EXCEEDING 7.5 TONNE PERMITTED

P01	STAGE 3	12.11.21	GR	KG
Rev.	Description:	Date:	By:	Chkd:



Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project:

VIADUX PHASE II, MANCHESTER

Drawing Title:

VIADUCT COLUMN PENETRATION PLAN

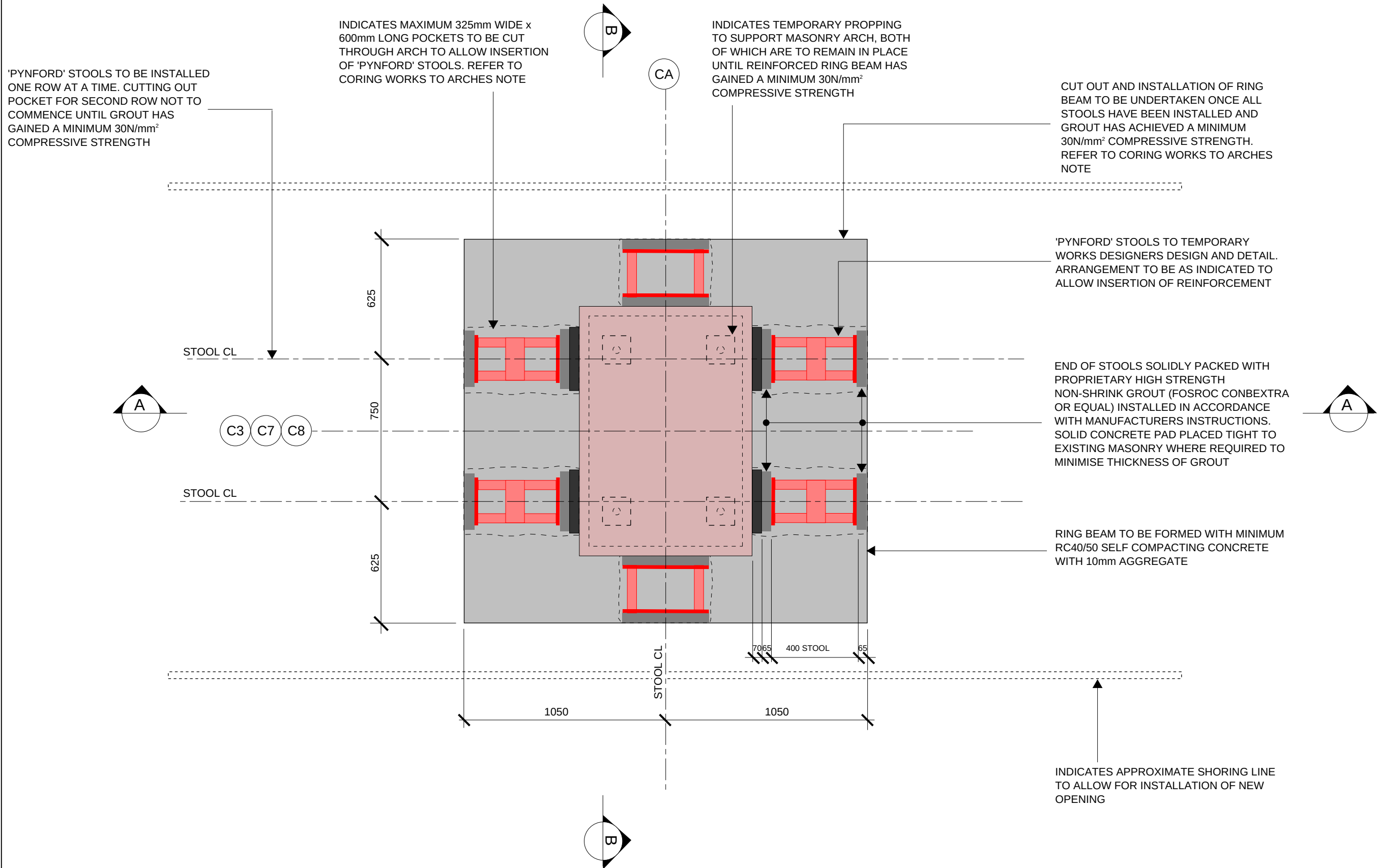
Status:

RIBA STAGE 3

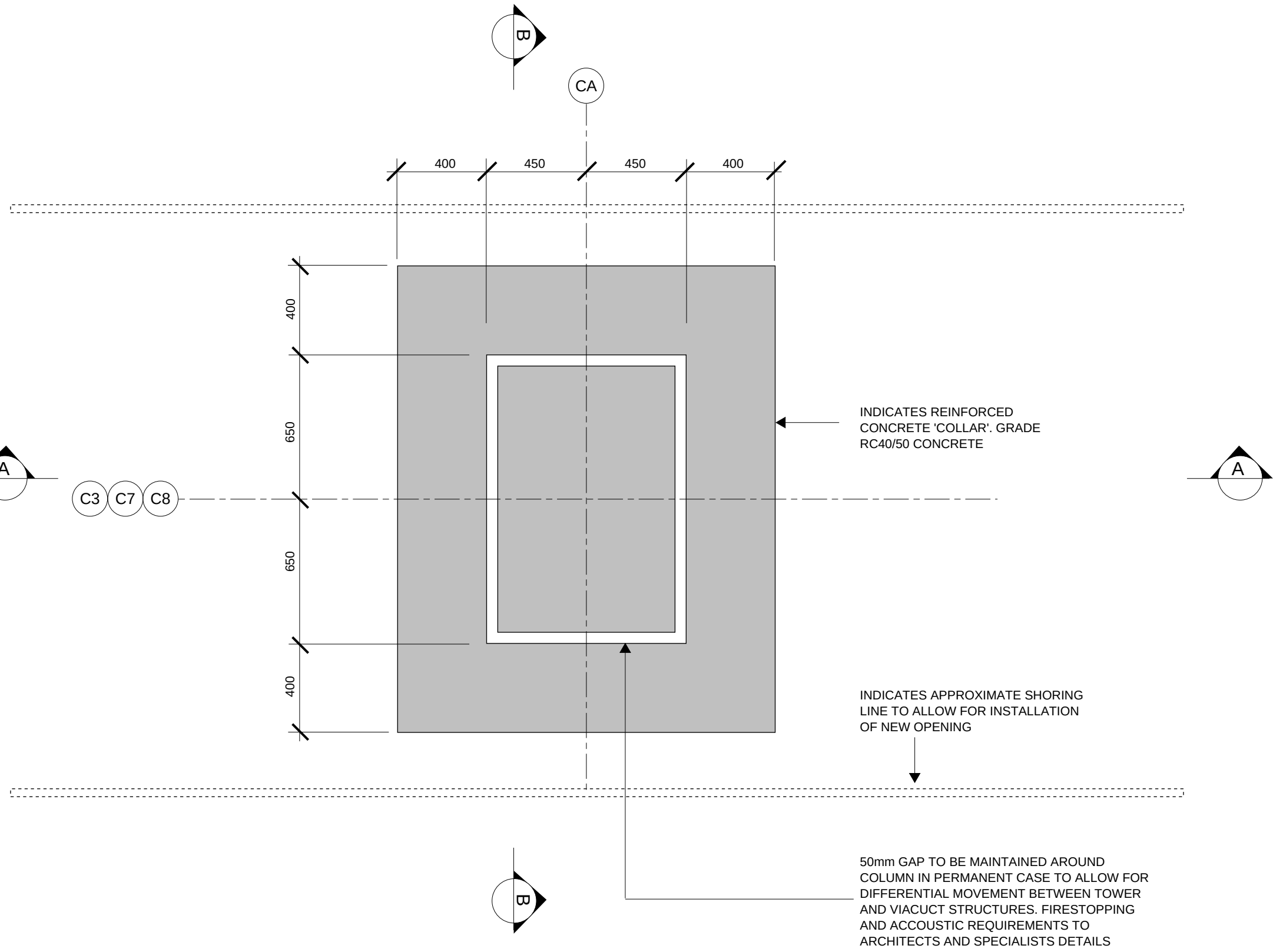
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A1	12.11.21	GR	GR	KG

Scale:	1:200	Project No:	2102-09				
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:

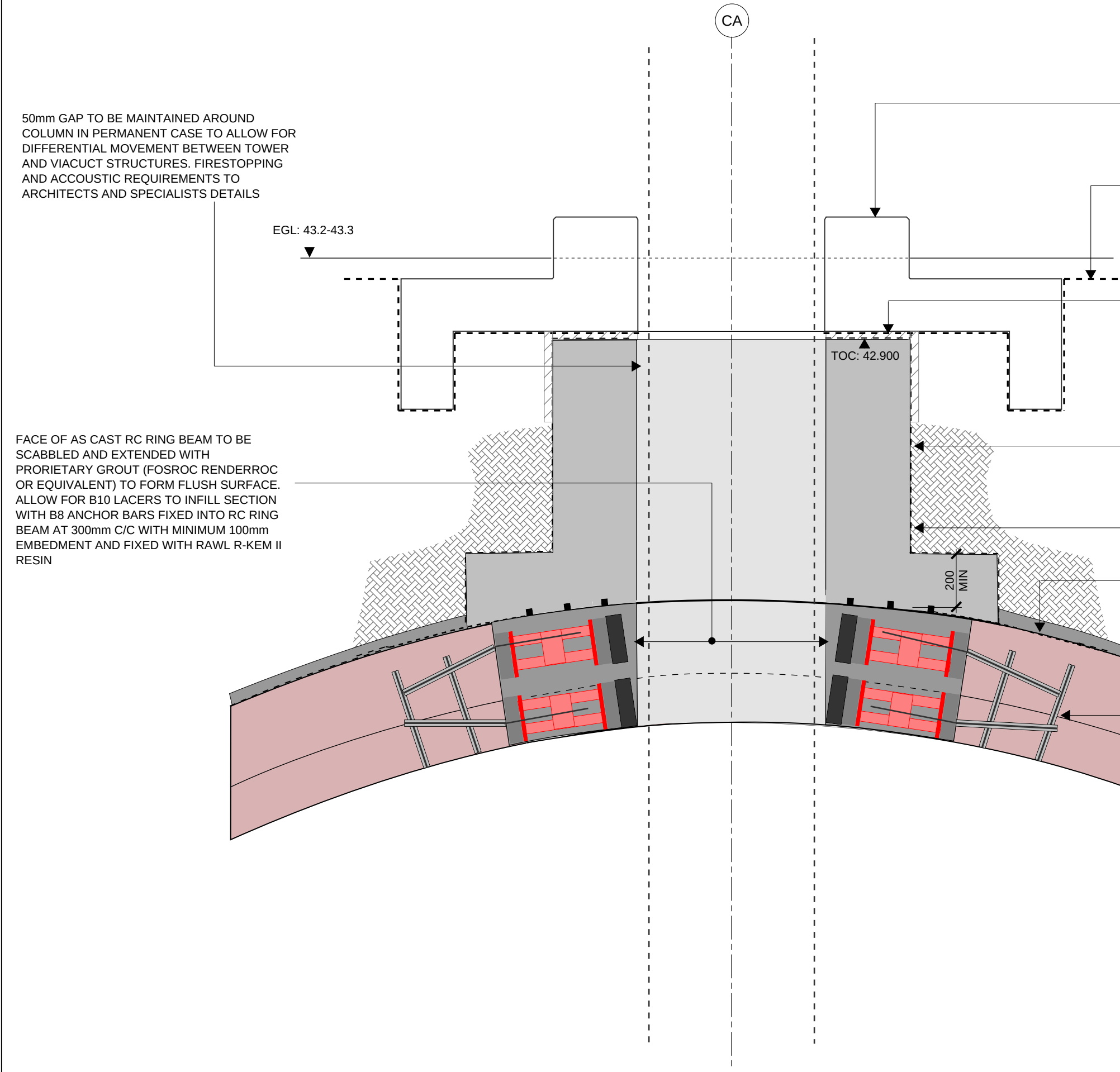
VI2-REN-AA-01-DR-S-02100-P01



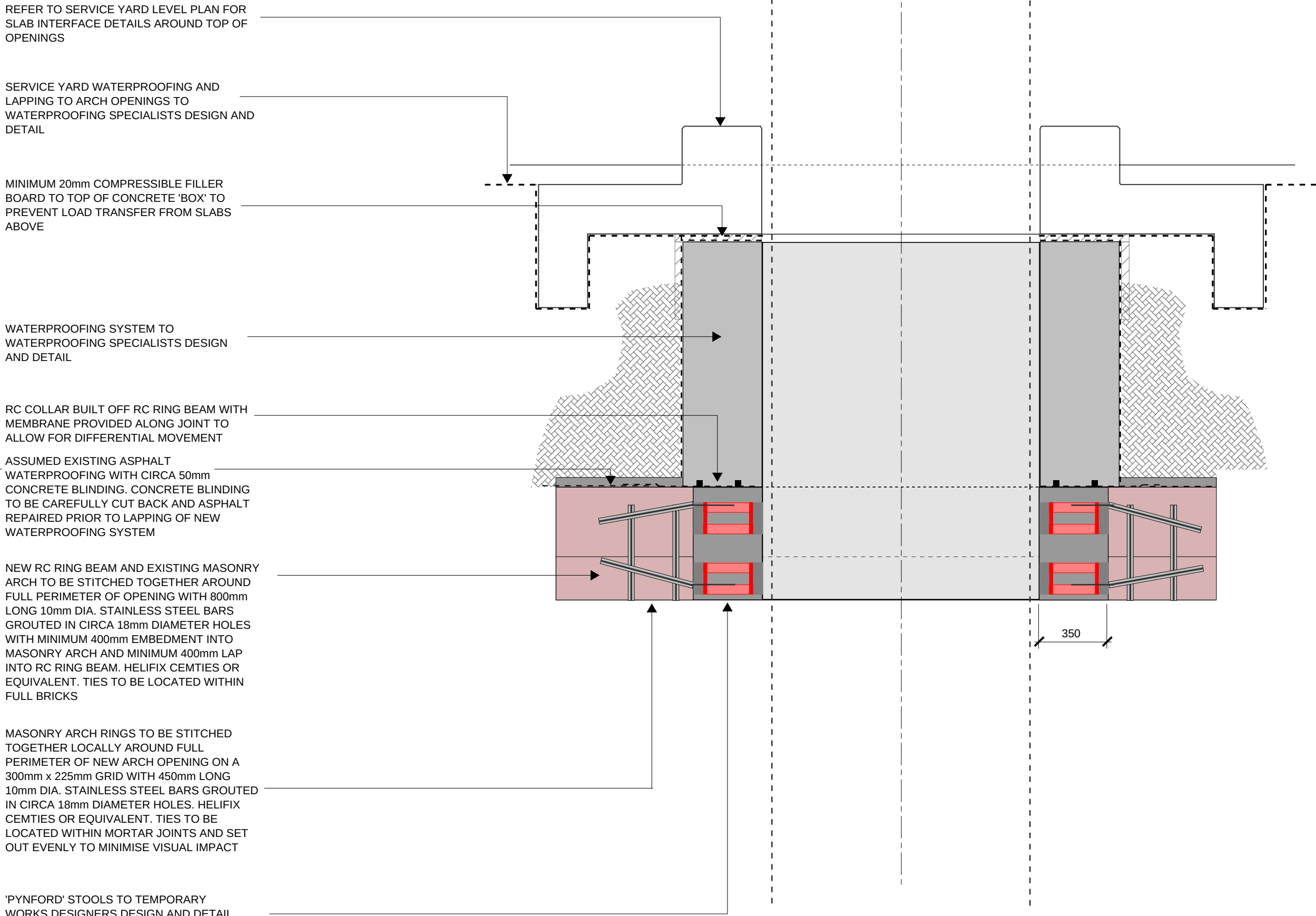
TYPE 1 RC RING BEAM PLAN
1:20



TYPE 1 RC 'COLLAR' PLAN
1:20



SECTION A-A
1:20



SECTION B-B
1:20

- GENERAL NOTES:**
- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING VI2-REN-AA-ZZ-DR-S-02100.

RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

WATERPROOFING
THE NEW RC STRUCTURES ARE TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING WATERPROOFING SYSTEMS TO MAINTAIN CONTINUITY AND PREVENT WATER INGRESS TROUGH THE VIADUCT STRUCTURE AND BRIDGES. ALL WATERPROOFING, INCLUDING LAPPING TO THE EXISTING WATERPROOFING SYSTEMS IS TO THE SPECIALIST WATERPROOFING SUPPLIERS DESIGN AND DETAIL. THE CONTRACTOR IS TO APPOINTED A WATERPROOFING SPECIALIST TO CO-ORDINATE AND DETAIL ALL WATERPROOFING WORKS. ALL WATERPROOFING INDICATED ON THESE DRAWINGS IS INDICATIVE ONLY AND THE FINAL LOCATION AND DETAILS ARE TO BE TO THE ARCHITECTS INTENT AND WATERPROOFING SPECIALIST DESIGN.

CORING WORKS TO ARCHES
ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALISTS TO ALLOW THE CORING TECHNIQUES TO BE AGREED AND REQUIREMENTS ON OPENING SIZES TO BE INCORPORATED INTO THE STAGE 4 TECHNICAL DESIGN. METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS.

Rev:	Description:	Date:	By:	Chkd:
P01	STAGE 3	12.11.21	GR	KG



VIADUX PHASE II, MANCHESTER

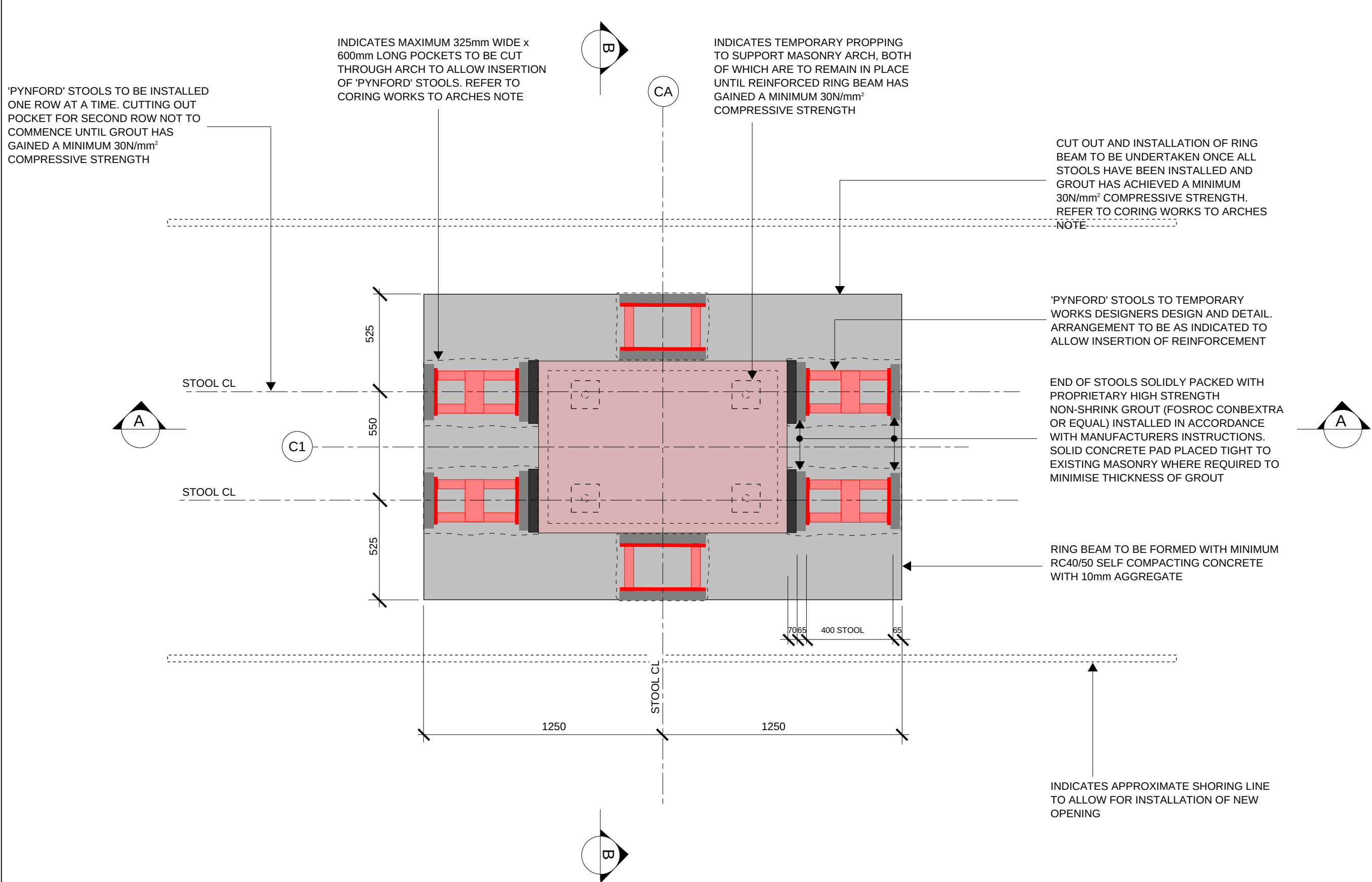
VIADUCT COLUMN PENETRATION DETAIL: TYPE 1

Status:
RIBA STAGE 3

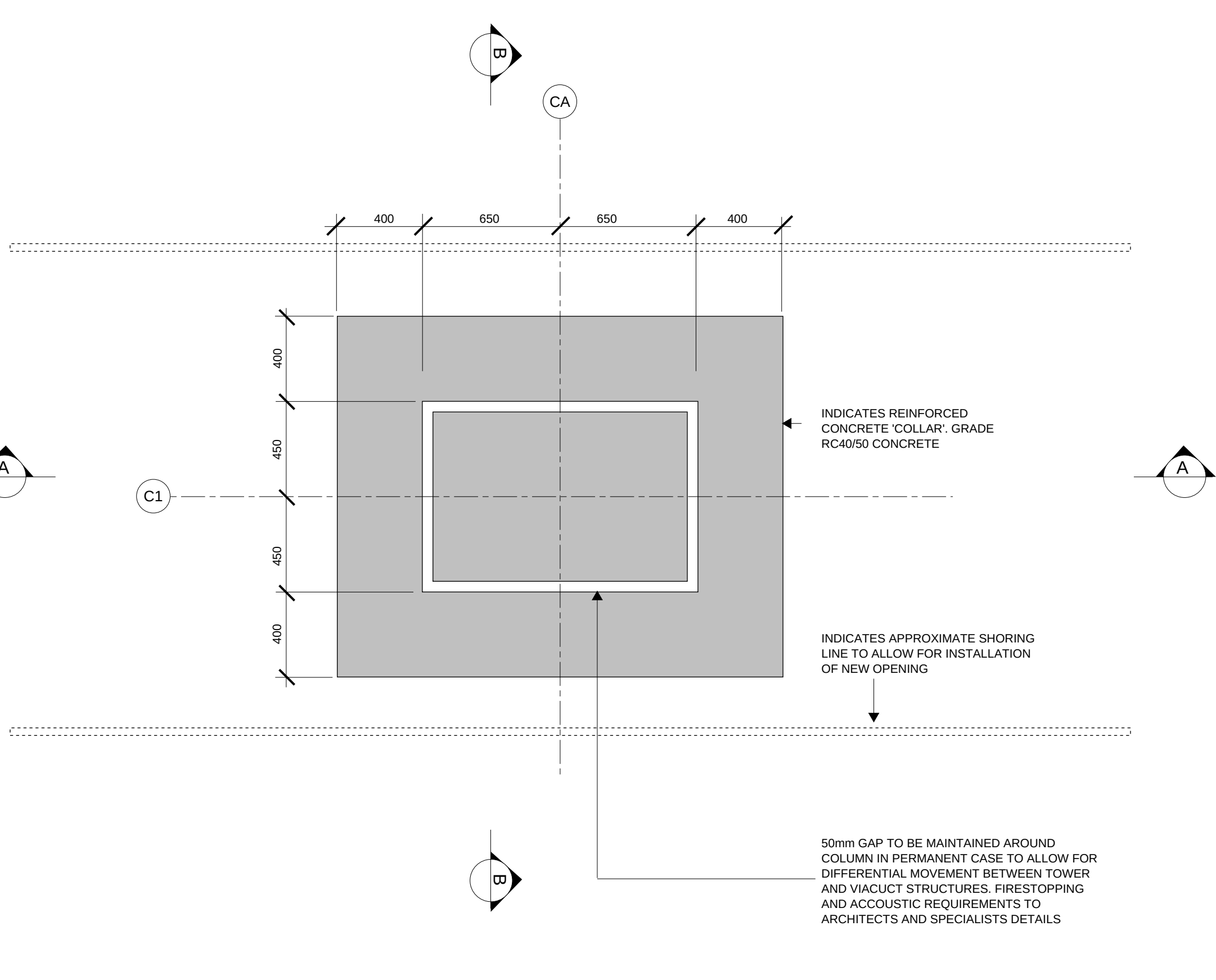
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	12.11.21	GR	GR	KG

Scale:	Project:	Originator:	Volume:	Level:	Type:	Rate:	Category/Number:	Rev:
1:20	2102-09							

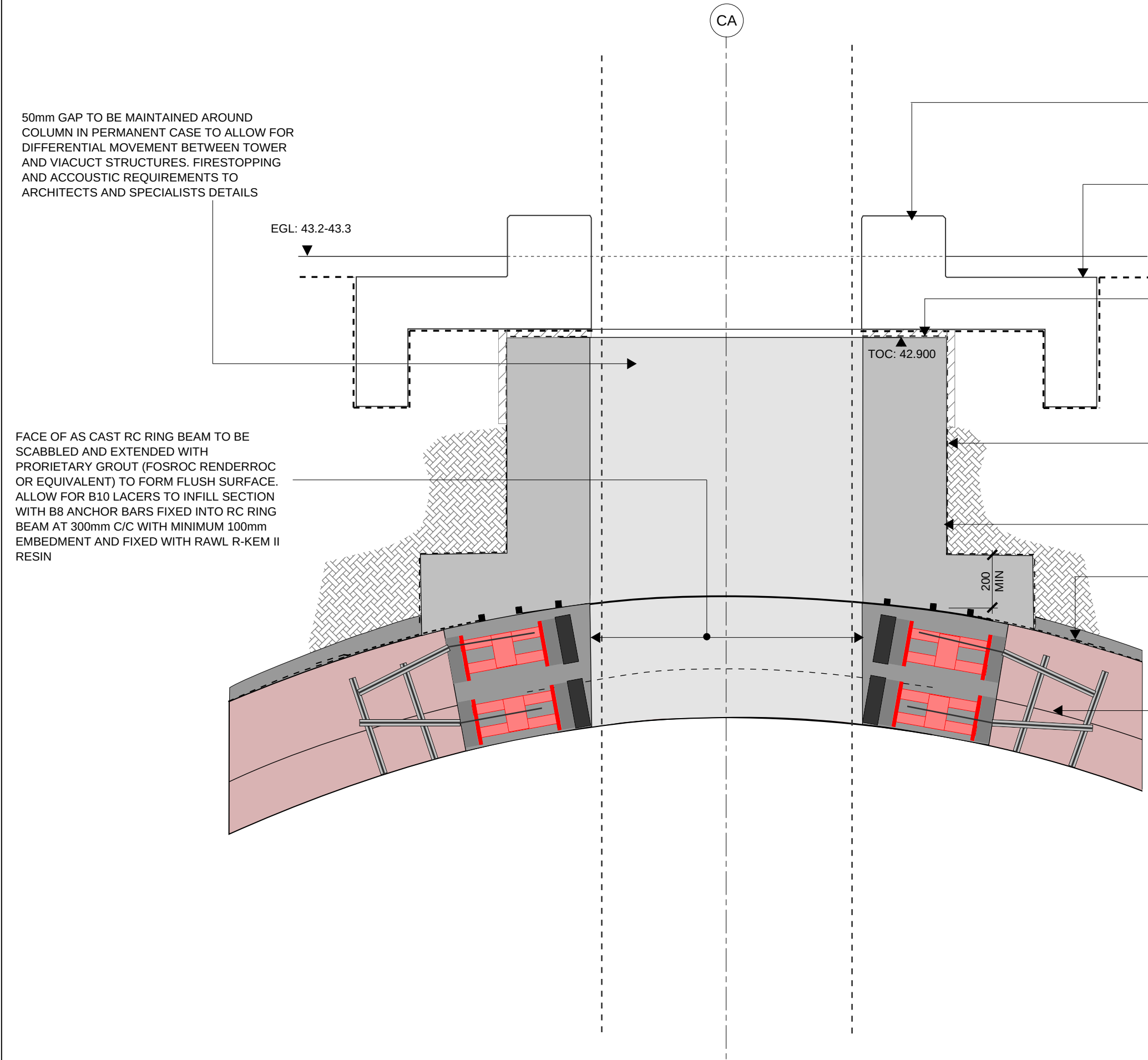
VI2-REN-AA-ZZ-DR-S-02300-P01



TYPE 2 RC RING BEAM PLAN
1:20



TYPE 2 RC 'COLLAR' PLAN
1:20



SECTION A-A
1:20

REFER TO SERVICE YARD LEVEL PLAN FOR SLAB INTERFACE DETAILS AROUND TOP OF OPENINGS

SERVICE YARD WATERPROOFING AND LAPPING TO ARCH OPENINGS TO WATERPROOFING SPECIALISTS DESIGN AND DETAIL

MINIMUM 20mm COMPRESSIBLE FILLER BOARD TO TOP OF CONCRETE 'BOX' TO PREVENT LOAD TRANSFER FROM SLABS ABOVE

WATERPROOFING SYSTEM TO WATERPROOFING SPECIALISTS DESIGN AND DETAIL

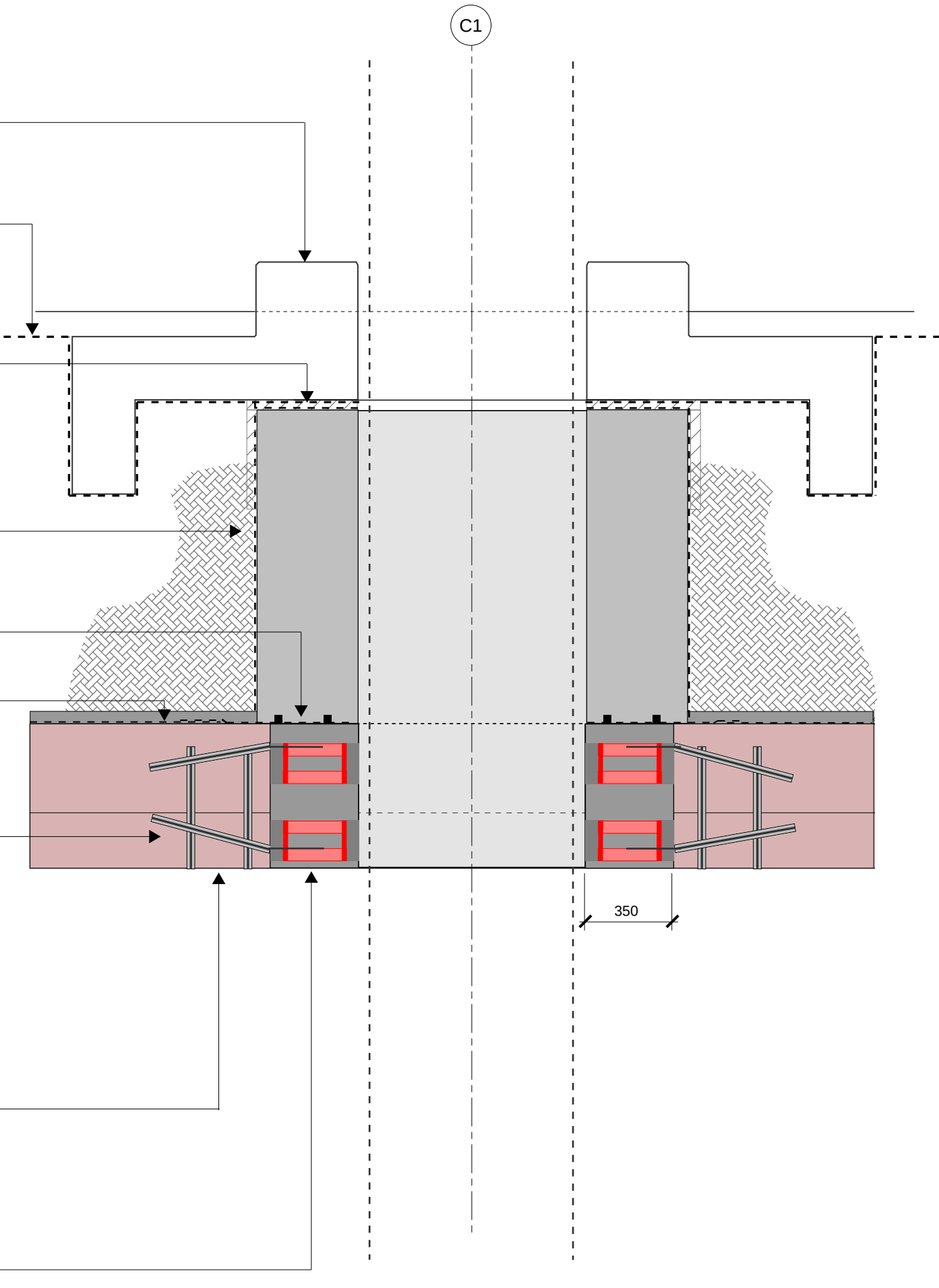
RC COLLAR BUILT OFF RC RING BEAM WITH MEMBRANE PROVIDED ALONG JOINT TO ALLOW FOR DIFFERENTIAL MOVEMENT

ASSUMED EXISTING ASPHALT WATERPROOFING WITH CIRCA 50mm CONCRETE BLINDING. CONCRETE BLINDING TO BE CAREFULLY CUT BACK AND ASPHALT REPAIRED PRIOR TO LAPPING OF NEW WATERPROOFING SYSTEM

NEW RC RING BEAM AND EXISTING MASONRY ARCH TO BE STITCHED TOGETHER AROUND FULL PERIMETER OF OPENING WITH 800mm LONG 10mm DIA. STAINLESS STEEL BARS GROUTED IN CIRCA 18mm DIAMETER HOLES WITH MINIMUM 400mm EMBEDMENT INTO MASONRY ARCH AND MINIMUM 400mm LAP INTO RC RING BEAM. HELIFIX CEMENTIES OR EQUIVALENT. TIES TO BE LOCATED WITHIN FULL BRICKS

MASONRY ARCH RINGS TO BE STITCHED TOGETHER LOCALLY AROUND FULL PERIMETER OF NEW ARCH OPENING ON A 300mm x 225mm GRID WITH 450mm LONG 10mm DIA. STAINLESS STEEL BARS GROUTED IN CIRCA 18mm DIAMETER HOLES. HELIFIX CEMENTIES OR EQUIVALENT. TIES TO BE LOCATED WITHIN MORTAR JOINTS AND SET OUT EVENLY TO MINIMISE VISUAL IMPACT

'PYNFORD' STOOLS TO TEMPORARY WORKS DESIGNERS DESIGN AND DETAIL. CIRCA 450mm LONG ON PLAN AND 160mm DEEP TO ALLOW FOR INSTALLATION OF RC RING BEAM



SECTION B-B
1:20

- GENERAL NOTES:**
- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING VI2-REN-AA-ZZ-DR-S-02100.

RIBA STAGE 3

ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

WATERPROOFING

THE NEW RC STRUCTURES ARE TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING WATERPROOFING SYSTEMS TO MAINTAIN CONTINUITY AND PREVENT WATER INGRESS TROUGH THE VIADUCT STRUCTURE AND BRIDGES. ALL WATERPROOFING, INCLUDING LAPPING TO THE EXISTING WATERPROOFING SYSTEMS IS TO THE SPECIALIST WATERPROOFING SUPPLIERS DESIGN AND DETAIL. THE CONTRACTOR IS TO APPOINTED A WATERPROOFING SPECIALIST TO CO-ORDINATE AND DETAIL ALL WATERPROOFING WORKS. ALL WATERPROOFING INDICATED ON THESE DRAWINGS IS INDICATIVE ONLY AND THE FINAL LOCATION AND DETAILS ARE TO BE TO THE ARCHITECTS INTENT AND WATERPROOFING SPECIALIST DESIGN.

CORING WORKS TO ARCHES

ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALISTS TO ALLOW THE CORING TECHNIQUES TO BE AGREED AND REQUIREMENTS ON OPENING SIZES TO BE INCORPORATED INTO THE STAGE 4 TECHNICAL DESIGN. METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS.

P01	STAGE 3	12.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:



VIADUX PHASE II, MANCHESTER

VIADUCT COLUMN PENETRATION DETAIL: TYPE 2

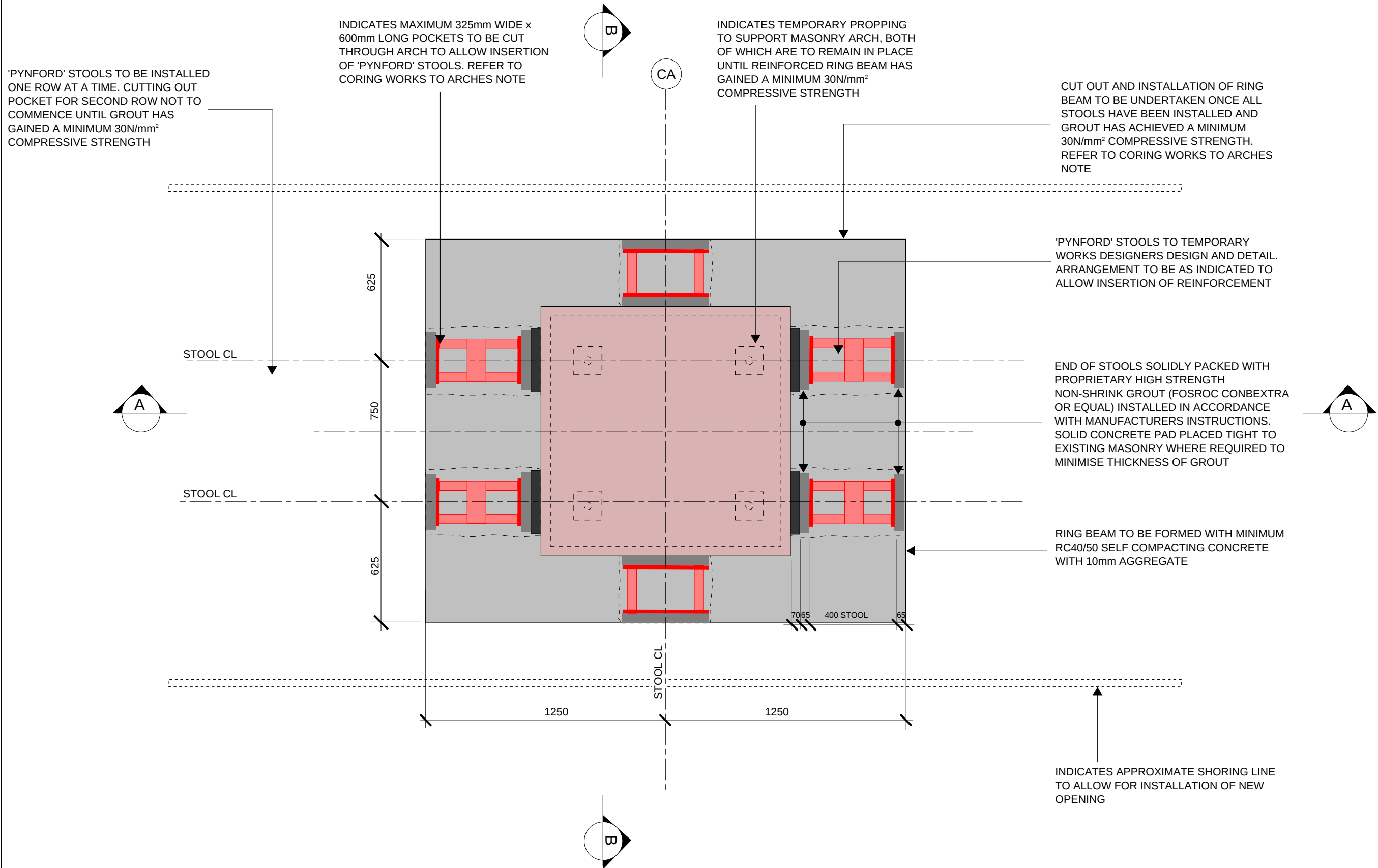
RIBA STAGE 3

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	12.11.21	GR	GR	KG

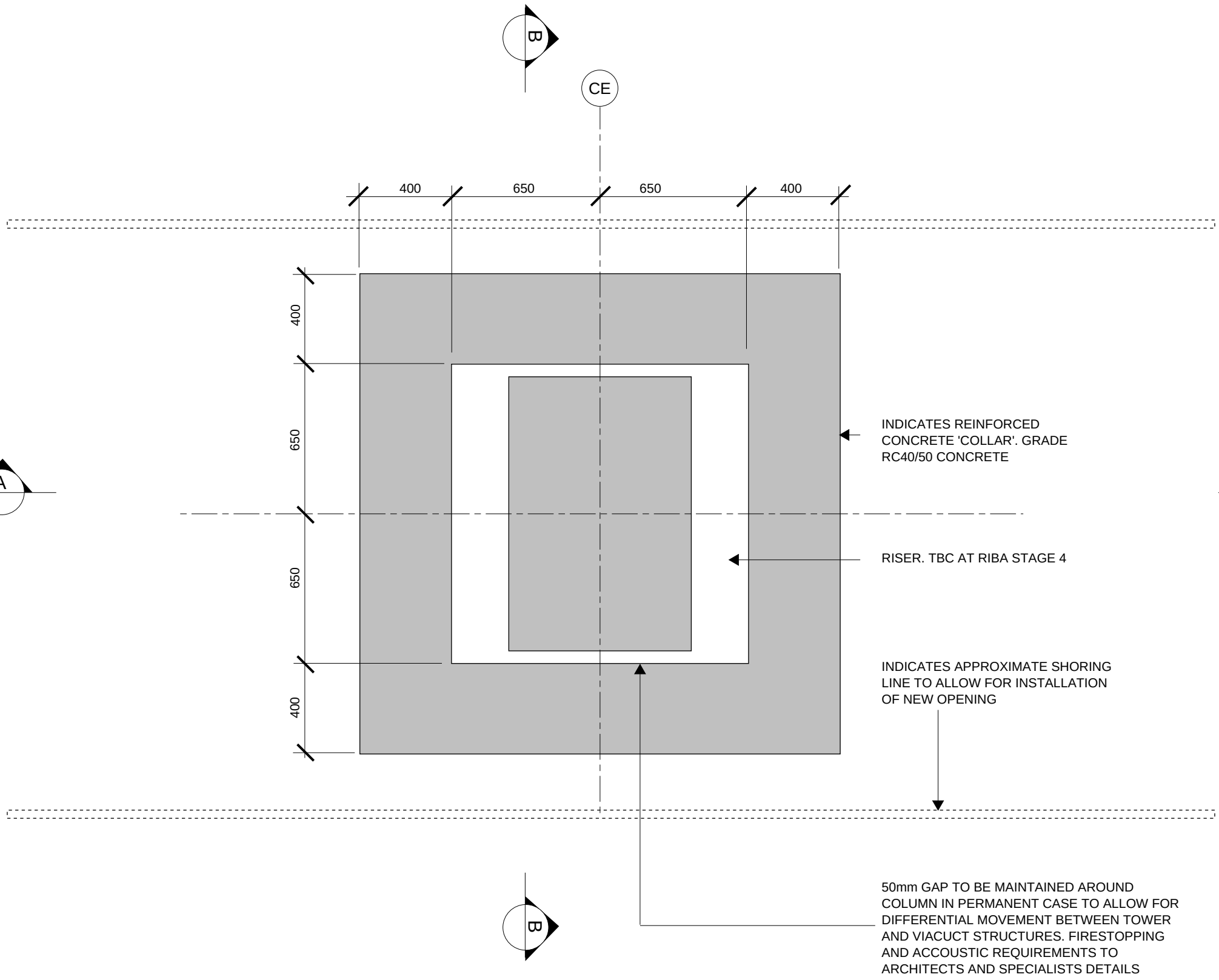
Scale:	Project No:
1:20	2102-09

Project:	Originator:	Volume:	Level:	Type:	Rate:	Category/Number:	Rev:
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VI2-REN-AA-ZZ-DR-S-02301-P01



TYPE 3 RC RING BEAM PLAN
1:20



TYPE 3 RC 'COLLAR' PLAN
1:20

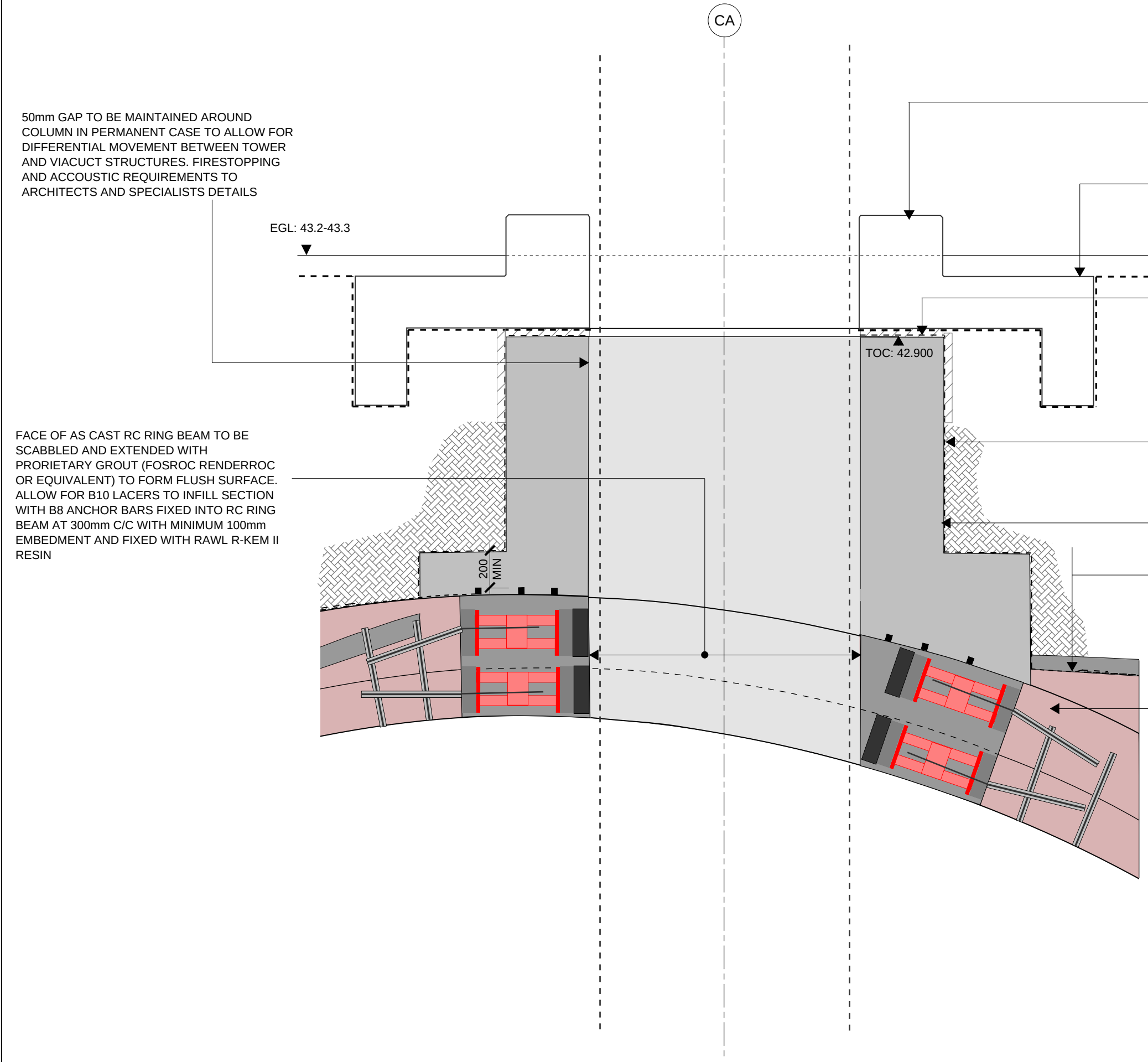
- GENERAL NOTES:**
- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 - FOR ADDITIONAL NOTES REFER TO DRAWING VI2-REN-AA-ZZ-DR-S-02100.

RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

WATERPROOFING
THE NEW RC STRUCTURES ARE TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING WATERPROOFING SYSTEMS TO MAINTAIN CONTINUITY AND PREVENT WATER INGRESS TROUGH THE VIADUCT STRUCTURE AND BRIDGES. ALL WATERPROOFING, INCLUDING LAPPING TO THE EXISTING WATERPROOFING SYSTEMS IS TO THE SPECIALIST WATERPROOFING SUPPLIERS DESIGN AND DETAIL. THE CONTRACTOR IS TO APPOINTED A WATERPROOFING SPECIALIST TO CO-ORDINATE AND DETAIL ALL WATERPROOFING WORKS. ALL WATERPROOFING INDICATED ON THESE DRAWINGS IS INDICATIVE ONLY AND THE FINAL LOCATION AND DETAILS ARE TO BE TO THE ARCHITECTS INTENT AND WATERPROOFING SPECIALIST DESIGN.

CORING WORKS TO ARCHES
ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALISTS TO ALLOW THE CORING TECHNIQUES TO BE AGREED AND REQUIREMENTS ON OPENING SIZES TO BE INCORPORATED INTO THE STAGE 4 TECHNICAL DESIGN. METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS.



SECTION A-A
1:20

REFER TO SERVICE YARD LEVEL PLAN FOR SLAB INTERFACE DETAILS AROUND TOP OF OPENINGS

SERVICE YARD WATERPROOFING AND LAPPING TO ARCH OPENINGS TO WATERPROOFING SPECIALISTS DESIGN AND DETAIL

MINIMUM 20mm COMPRESSIBLE FILLER BOARD TO TOP OF CONCRETE 'BOX' TO PREVENT LOAD TRANSFER FROM SLABS ABOVE

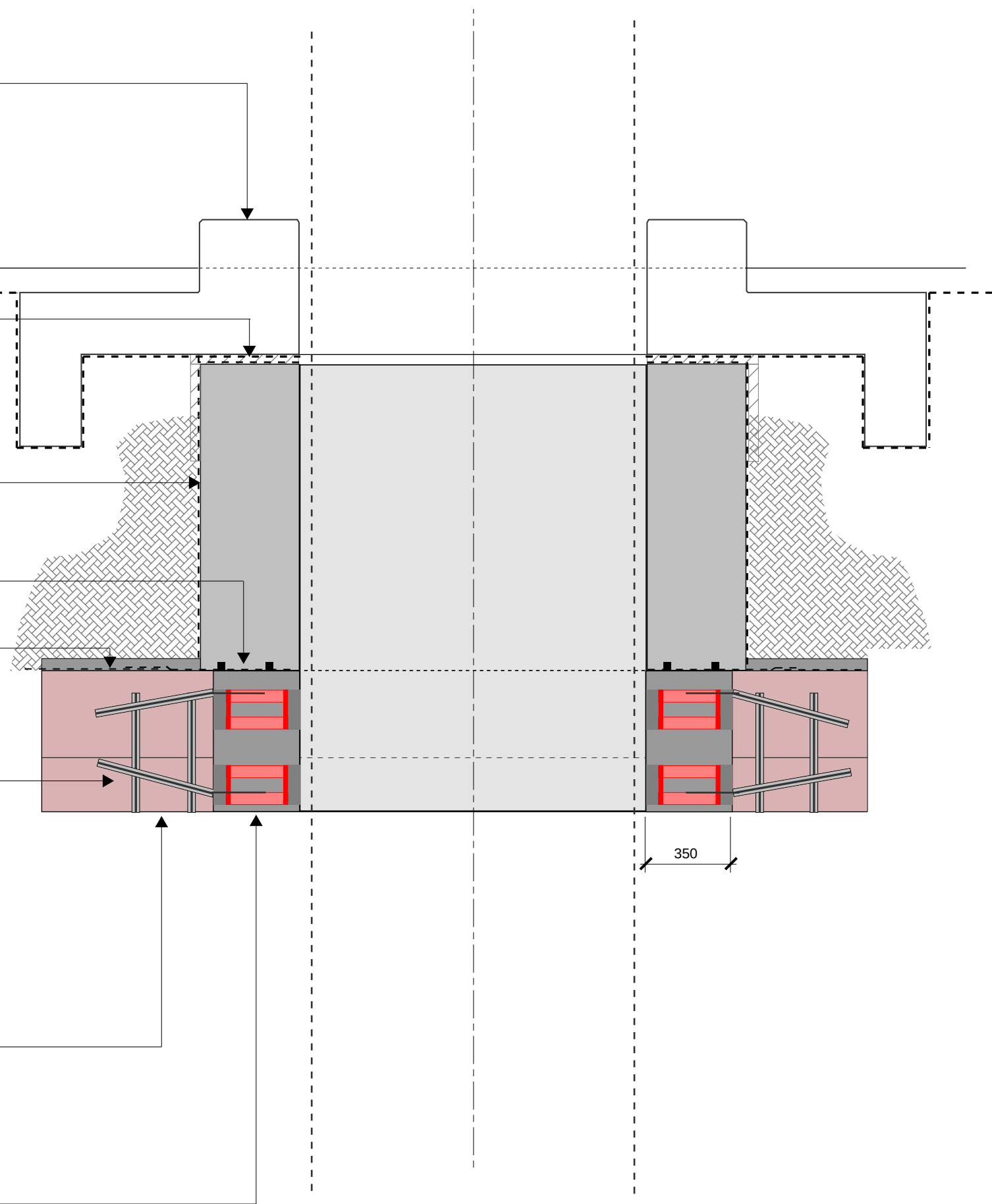
WATERPROOFING SYSTEM TO WATERPROOFING SPECIALISTS DESIGN AND DETAIL

RC COLLAR BUILT OFF RC RING BEAM WITH MEMBRANE PROVIDED ALONG JOINT TO ALLOW FOR DIFFERENTIAL MOVEMENT
ASSUMED EXISTING ASPHALT WATERPROOFING WITH CIRCA 50mm CONCRETE BLINDING. CONCRETE BLINDING TO BE CAREFULLY CUT BACK AND ASPHALT REPAIRED PRIOR TO LAPPING OF NEW WATERPROOFING SYSTEM

NEW RC RING BEAM AND EXISTING MASONRY ARCH TO BE STITCHED TOGETHER AROUND FULL PERIMETER OF OPENING WITH 800mm LONG 10mm DIA. STAINLESS STEEL BARS GROUTED IN CIRCA 18mm DIAMETER HOLES WITH MINIMUM 400mm EMBEDMENT INTO MASONRY ARCH AND MINIMUM 400mm LAP INTO RC RING BEAM. HELIFIX CEMENTIES OR EQUIVALENT. TIES TO BE LOCATED WITHIN FULL BRICKS

MASONRY ARCH RINGS TO BE STITCHED TOGETHER LOCALLY AROUND FULL PERIMETER OF NEW ARCH OPENING ON A 300mm x 225mm GRID WITH 450mm LONG 10mm DIA. STAINLESS STEEL BARS GROUTED IN CIRCA 18mm DIAMETER HOLES. HELIFIX CEMENTIES OR EQUIVALENT. TIES TO BE LOCATED WITHIN MORTAR JOINTS AND SET OUT EVENLY TO MINIMISE VISUAL IMPACT

'PYNFORD' STOOLS TO TEMPORARY WORKS DESIGNERS DESIGN AND DETAIL. CIRCA 450mm LONG ON PLAN AND 160mm DEEP TO ALLOW FOR INSTALLATION OF RC RING BEAM



SECTION B-B
1:20

P01	STAGE 3	12.11.21	GR	KG
Rev:	Description:	Date:	By:	Chkd:



VIADUX PHASE II, MANCHESTER

VIADUCT COLUMN PENETRATION DETAIL: TYPE 3

Status:
RIBA STAGE 3

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	12.11.21	GR	GR	KG

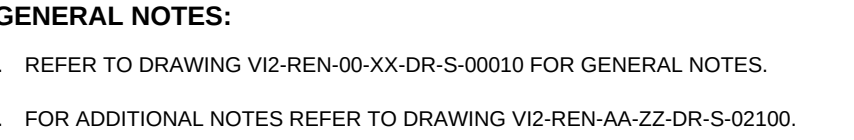
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Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:

VI2-REN-AA-ZZ-DR-S-02302-P01



- ## **CORING WORKS TO ARCHES**
- ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALISTS TO ALLOW THE CORING TECHNIQUES TO BE AGREED AND REQUIREMENTS ON OPENING SIZES TO BE INCORPORATED INTO THE STAGE 4 TECHNICAL DESIGN. METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS.

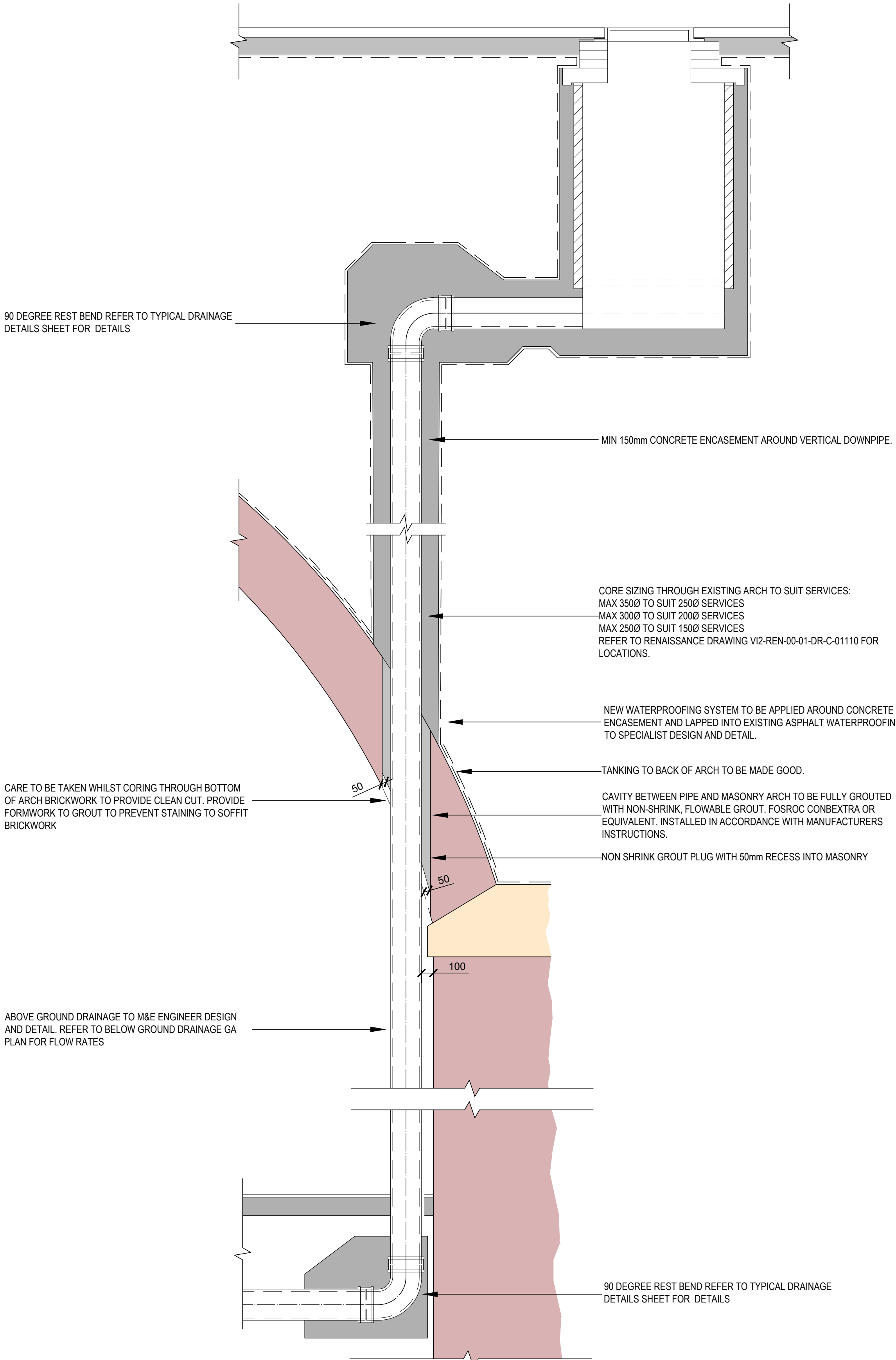
P01		STAGE 3				12.11.21	GR		
Rev:		Description:				Date:	By:	Chkd:	
						Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG			
Project:									
VIADUX PHASE II, MANCHESTER									
Drawing Title:									
VIADUCT COLUMN PENETRATION DETAIL: TYPE 4									
Status:									
RIBA STAGE 3									
Size:	A1		Date:	12.11.21		Drawn by:	GR		Checked by:
Scale:	1:20		Project No:			2102-09			
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:		Rev:	
V12-REN-AA-ZZ-DR-S-02303-P01									



A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

CORING WORKS TO ARCHES

ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALISTS TO ALLOW THE CORING TECHNIQUES TO BE AGREED AND REQUIREMENTS ON OPENING SIZES TO BE INCORPORATED INTO THE STAGE 4 TECHNICAL DESIGN. METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS.



TYPICAL DROP PIPE PENETRATION DETAIL
SCALE 1:25

23. NO CEMENT BASED MORTAR IS PERMITTED FOR USE WITHIN MASONRY WORKS. ALL NEW AND REPAIR WORKS UNDERTAKEN ARE TO BE WITH A LIME MORTAR:
- HLM 3.5 - GENERAL MASONRY WORKS 150mm ABOVE GROUND LEVEL
- HLM 5.0 - WORKS BELOW GROUND

RIBA STAGE 3
THE INFORMATION IS APPROPRIATE FOR RIBA STAGE 3 AND INTENDED TO COMMUNICATE THE STRUCTURAL PRINCIPLES OF THE PROPOSAL. THE DESIGN AND DETAILS WILL BE UPDATED AS FURTHER SURVEYS ARE UNDERTAKEN AND INITIAL STRUCTURAL ANALYSIS AND DESIGN CO-ORDINATION IS UNDERTAKEN WITH THE DESIGN TEAM DURING RIBA STAGES 4 AND 5.

CORING WORKS TO ARCHES
ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALIST TO ALLOW THE CORING TECHNIQUES TO BE AGREED. METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS.

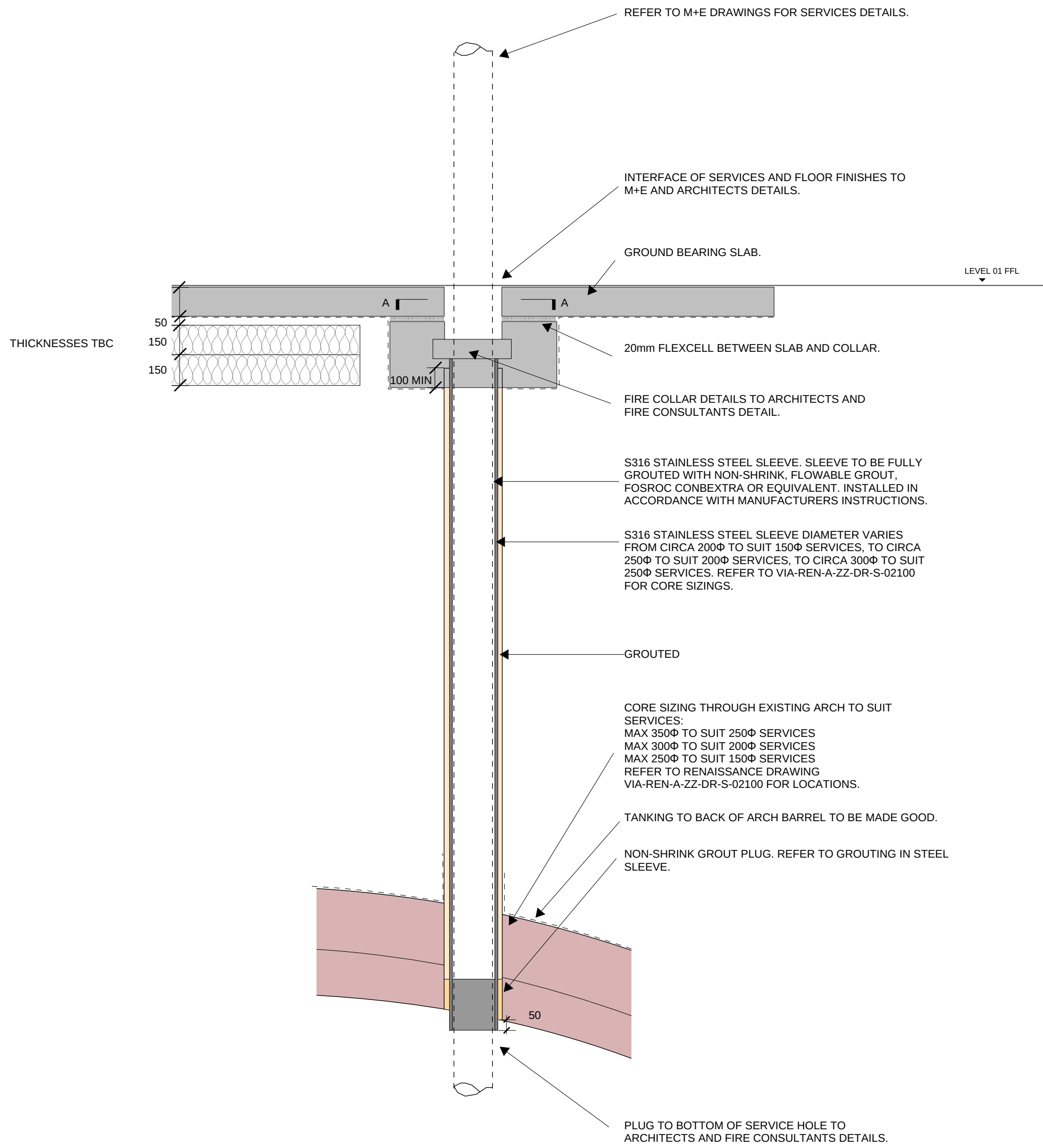
WATERPROOFING
ALLOW FOR ALL THE NEW STEEL/MASONRY STRUCTURE TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING TO MAINTAIN CONTINUITY OF THE EXISTING ASPHALT WATERPROOFING OVER THE ARCHES. ALL WATERPROOFING, INCLUDING LAPPING TO EXISTING ASPHALT IS TO BE TO SPECIALIST MANUFACTURERS DESIGN AND DETAILS.

- NOTES:
- REFER TO DRAWING S-00-010 FOR GENERAL NOTES.
 - ALL DIMENSIONS ARE IN MILLIMETERS
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE BELOW GROUND DRAINAGE SPECIFICATION, BELOW GROUND DRAINAGE PLANS ON DRAWINGS C-01100 & C-01101 AND MANHOLE SCHEDULE SHOWN ON SH-01301.
 - ALL BELOW GROUND DRAINAGE WORKS TO BE IN ACCORDANCE WITH RELEVANT BUILDING REGULATIONS AND SEWER SECTOR GUIDANCE APPENDIX C- DESIGN AND CONSTRUCTION GUIDANCE. IF DISCREPANCIES ARE NOTED BETWEEN SSG AND DRAWINGS THESE SHOULD BE BROUGHT TO THE ATTENTION OF RENAISSANCE FOR REVIEW.
 - CONCRETE BENCHING AND PIPE SURROUND SHALL BE PLACED IN SINGLE CONTINUOUS OPERATION FROM TOP OF BASE SLAB TO TOP OF BENCHING AND PIPE SURROUND CONNECTION INTO MANHOLES SHALL BE CONSTRUCTED WITH THE SOFFITS AT THE LEVEL UNLESS DETAILED DIFFERENTLY ON CONTRACT DRAWINGS
 - METALWORK
LADDERS, HANDRAILING AND SAFETY CHAIN REFER TO DETAILS
 - CONCRETE SURROUND TO MANHOLES
A CONCRETE SURROUND IS NOT NORMALLY REQUIRED TO UNLESS INSTALLED IN AREAS OF UNSTABLE GROUND, UNDER CONDITIONS OF FLotation OR WHERE SUBJECTED TO EXCEPTIONAL OR ECCENTRIC LOADS. IN WHICH CASES A 150 SURROUND OF AT LEAST 20 N/mm CONCRETE SHALL BE PROVIDED. ANY JOINTS SHOULD BE STAGGERED WITH PRECAST CONCRETE JOINTS.

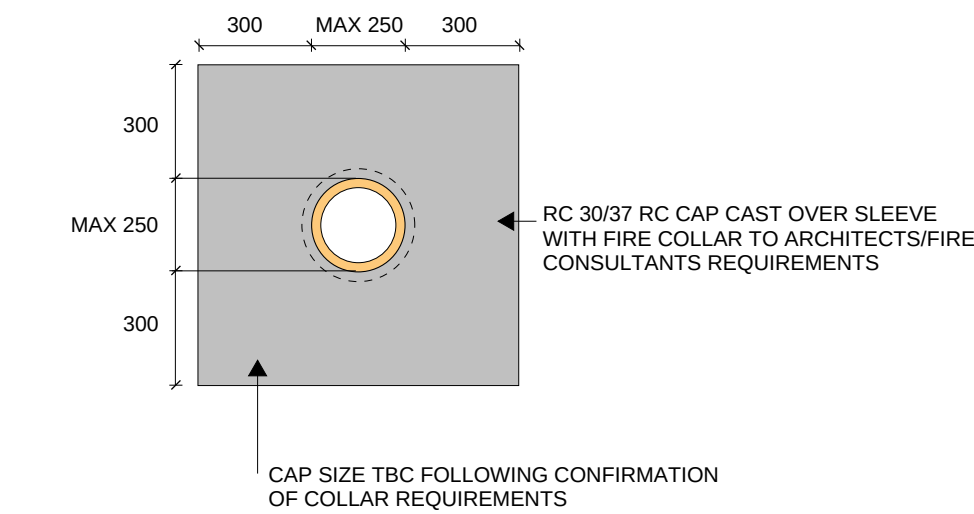
LEVEL 00 - NO CONCRETE SURROUND REQUIRED UNLESS SUBJECTED TO EXCEPTIONAL OR ECCENTRIC LOADS

LEVEL 01 - CONCRETE SURROUND REQUIRED IN ALL LOCATIONS
 - THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED AN INCREMENT TO ACCOMMODATE THE CONNECTIONS AND BENDS.
 - MANHOLE COVERS ARE TO BE ACCORDANCE WITH BS EN 124 FOR THE RATING INDICATED IN THE MANHOLE SCHEDULE. THE CONTRACTOR IS TO SUBMIT DETAILS FOR THE PROPOSED MANHOLE COVERS TO THE ENGINEER AND LANDSCAPE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION.
 - COVER SLABS MUST CARRY THE BSI KITEMARK. WHERE THE CLEAR OPENING OF THE KITEMARKED PRODUCT IS DIFFERENT TO THAT OF THE COVER AND FRAME, A LOAD BEARING REDUCING SLAB SHOULD BE FITTED ABOVE THE COVER SLAB TO BRING THE SIZE DOWN TO REQUIRED SIZE.
 - ALL SEWERS TO BE BSI KITEMARK (CERTIFIED TO WIS 4-35-01)
 - ALL CONCRETE PIPES TO BE TO ES EN 1916 CLASS 120 (54kN/m).
 - BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2).
 - IF PLASTIC PIPES ARE TO BE USED THEN THE FOLLOWING MUST APPLY:
A. BSI KITEMARK (CERTIFIED TO BS EN 13476-1 AND WIS 4-35-01)
B. PIPES LESS THAN OR EQUAL TO 500mm DIA.
C. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2)
 - THE MINIMUM CRUSHING STRENGTH FOR CLAY PIPES SHOULD BE AS FOLLOWS: 100mm DIA. 40kN/m, 150mm DIA. 40kN/m, 225mm DIA. 45kN/m AND 300mm DIA. 72kN/m.
 - THE MINIMUM CRUSHING STRENGTH FOR CONCRETE PIPES SHOULD BE -(CLASS 120 TO EN 1916/BS5911-1 2002). PLASTIC PIPES SHOULD CONFORM TO WIS 4-35-01 AND BS EN13476.
 - SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVIDING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
 - CUT ENDS OF REINFORCED CONCRETE PIPES SHALL BE TREATED WITH EPOXY RESIN PAINT/MORTAR
 - MINIMUM LENGTH OF CHANNEL (X Min)
CHAMBER DIA "X" Min
1200 950
1500 1050
1800 1150
2100 1300
2400 1450
2700 1550
3000 1700
 - CUT ENDS OF REINFORCED CONCRETE PIPES SHALL BE TREATED WITH EPOXY RESIN PAINT/MORTAR DOUBLE STEPS SHALL BE PLASTIC ENCAPSULATED CARBON STEEL TO BS EN 1247-2. DOUBLE STEPS SHALL NOT BE USED WHERE COVER-TO-SOFFIT DIMENSION IS >3.0m
 - COVER AND FRAME
150mm DEEP COVERS ARE TO BE USED IN CATEGORY 1,2, 3
ROADS
100mm DEEP COVERS ARE TO BE USED IN CATEGORY 4
FRAME TO BE SET AS PER SPECIFICATION
 - CONCRETE
ALL IN-SITU CONCRETE TO BE DC - 3 OR FND3.

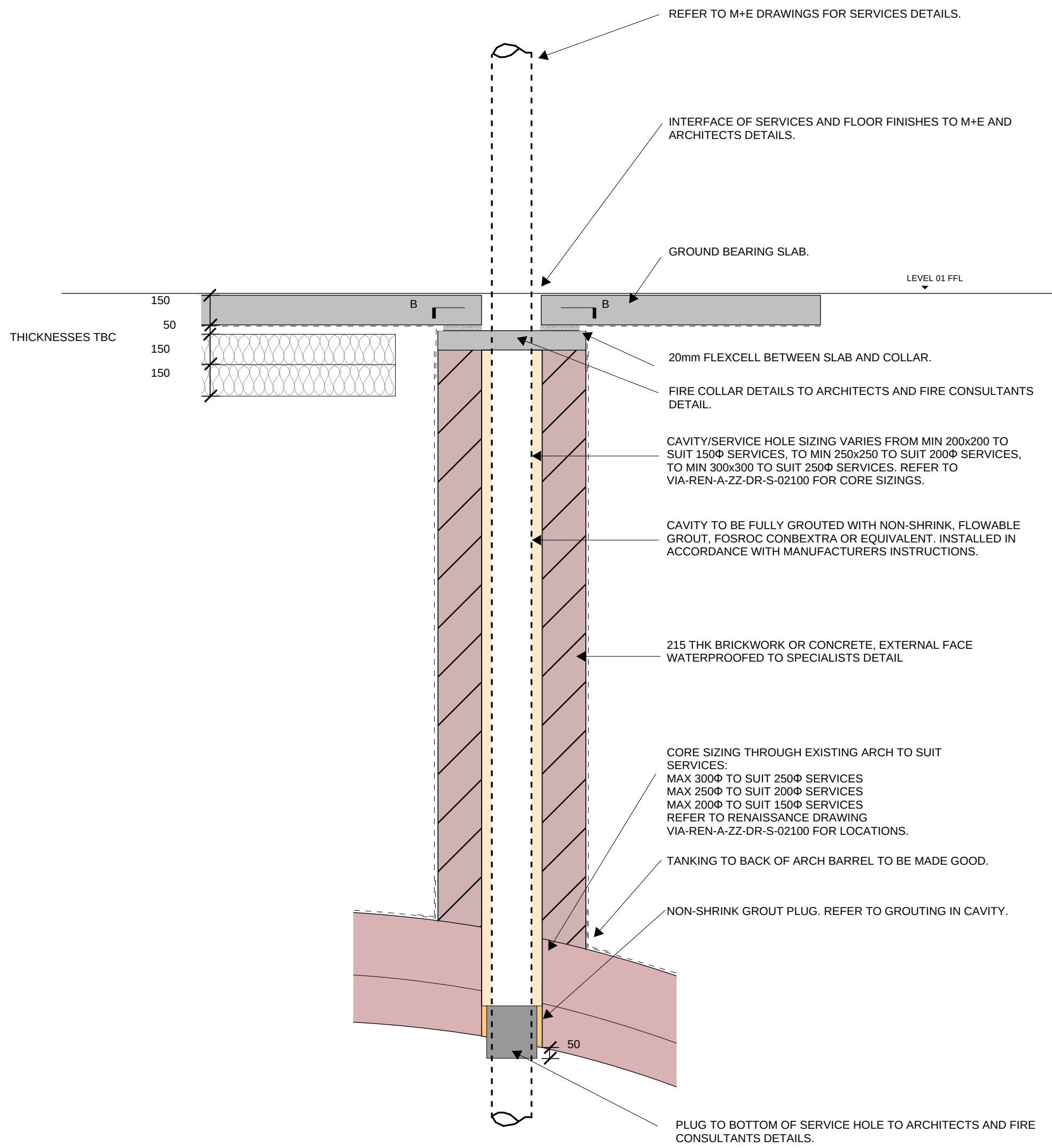
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Rev:	Description:	Date:	By:	Chkd:	
 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG					
Project: VIADUX PHASE 2, MANCHESTER					
Drawing Title: <i>TYPICAL DROP PIPE PENETRATION DETAIL</i>					
Status: STAGE 3					
Size:	Date:	Drawn by:	Designed by:	Checked by:	
A1	NOV'21	HW	HW	PC	
Scale:	A1	Project No:	2102-09		
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VI2 - REN - 00 - 00 - DR - C-03103 - P01					



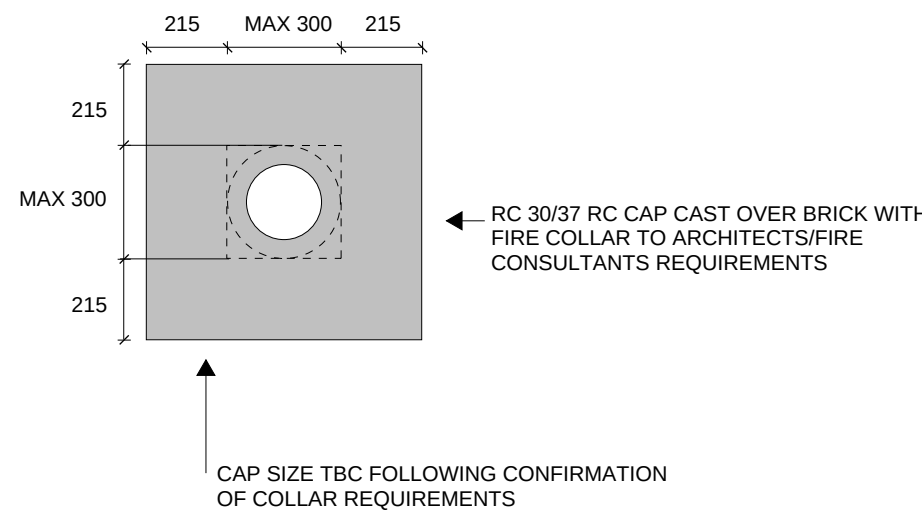
DETAIL 101
TYPICAL SERVICE PENETRATION - DEEP CORE PENETRATION
1:50



SECTION A-A
1:20



DETAIL 102
TYPICAL SERVICE PENETRATION - CORE IN PROXIMITY TO MAIN ARCH PENETRATIONS
1:50



SECTION B-B
1:20

NOTES:

- REFER TO DRAWINGS VIA-REN-A-XX-DR-S-00010 AND VIA-REN-A-ZZ-DR-S-02100 FOR NOTES.
- WHERE NEW BRICKS ARE REQUIRED THAT ARE NOT EXPOSED IN THE FINISHED WORKS THESE ARE TO BE SOLID CLASS B CLAY ENGINEERING BRICKS. ALL EXPOSED MASONRY TO BE SUITABLY SOURCED MASONRY TO MATCH EXISTING.
- NO CEMENT BASED MORTAR IS PERMITTED FOR USE WITHIN MASONRY WORKS. ALL NEW AND REPAIR WORKS UNDERTAKEN ARE TO BE WITH A LIME MORTAR:
HLM 3.5 - GENERAL MASONRY WORKS 150mm ABOVE GROUND LEVEL
HLM 5.0 - WORKS BELOW GROUND

RIBA STAGE 3

THE INFORMATION IS APPROPRIATE FOR RIBA STAGE 3 AND INTENDED TO COMMUNICATE THE STRUCTURAL PRINCIPLES OF THE PROPOSAL. THE DESIGN AND DETAILS WILL BE UPDATED AS FURTHER SURVEYS ARE UNDERTAKEN AND INITIAL STRUCTURAL ANALYSIS AND DESIGN CO-ORDINATION IS UNDERTAKEN WITH THE DESIGN TEAM DURING RIBA STAGES 4 AND 5.

SURVEYS

SURVEY WORKS ARE REQUIRED TO THE SERVICE YARD TO CONFIRM THE PROFILE TO THE TOP OF THE ARCHES, FORM OF BACKING CONSTRUCTION, AND FILL PROPERTIES. THIS WILL INFORM THE TECHNICAL DESIGN AND FINAL CONSTRUCTION DETAILS. UNTIL THE SURVEY WORKS HAVE BEEN COMPLETED AND REVIEWED THE DRAWINGS SHOULD BE INDICATIVE ONLY AND A SUITABLE RISK ALLOWANCE INCLUDED WITHIN THE TENDER.

CORING WORKS TO ARCHES

ALL CORING AND SAWING WORKS TO FORM POCKETS AND OPENINGS WITHIN THE ARCHES ARE TO USE NON-PERCUSSIVE TECHNIQUES TO MINIMISE DISTURBANCE TO THE GRADE II LISTED STRUCTURE. IT IS RECOMMENDED THAT THE CONTRACTOR SEEK EARLY INPUT FROM CORING SPECIALISTS TO ALLOW THE CORING TECHNIQUES TO BE AGREED AND REQUIREMENTS ON OPENING SIZES TO BE INCORPORATED INTO THE STAGE 4 TECHNICAL DESIGN. METHOD STATEMENTS FOR THE CORING WORKS MAY ALSO REQUIRE LISTED BUILDING CONSENT AND THE CONTRACTOR SHOULD PROGRAMME FOR ANY NECESSARY APPROVALS.

WATERPROOFING

ALLOW FOR ALL THE NEW STEEL/MASONRY STRUCTURE TO BE FULLY WATERPROOFED AND LAPPED INTO THE EXISTING TO MAINTAIN CONTINUITY OF THE EXISTING ASPHALT WATERPROOFING OVER THE ARCHES. ALL WATERPROOFING, INCLUDING LAPPING TO EXISTING ASPHALT IS TO BE TO SPECIALIST MANUFACTURERS DESIGN AND DETAILS. IT IS RECOMMENDED THAT A WATERPROOFING SPECIALIST IS APPOINTED AT THE BEGINNING OF RIBA STAGE 4 TO ALLOW CO-ORDINATION OF THE WATERPROOFING WITH THE PROPOSED STRUCTURAL WORKS.

P01	RIBA STAGE 3 ISSUE	15.06.20	RW	KG
Rev:	Description:	Date:	By:	Chkd:



Project:
**VIADUCT
MANCHESTER**

Drawing Title:
**VIADUCT TYPICAL SERVICE
PENETRATION DETAIL**

Status:
RIBA STAGE 3

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	15.06.20	RW	-	KG

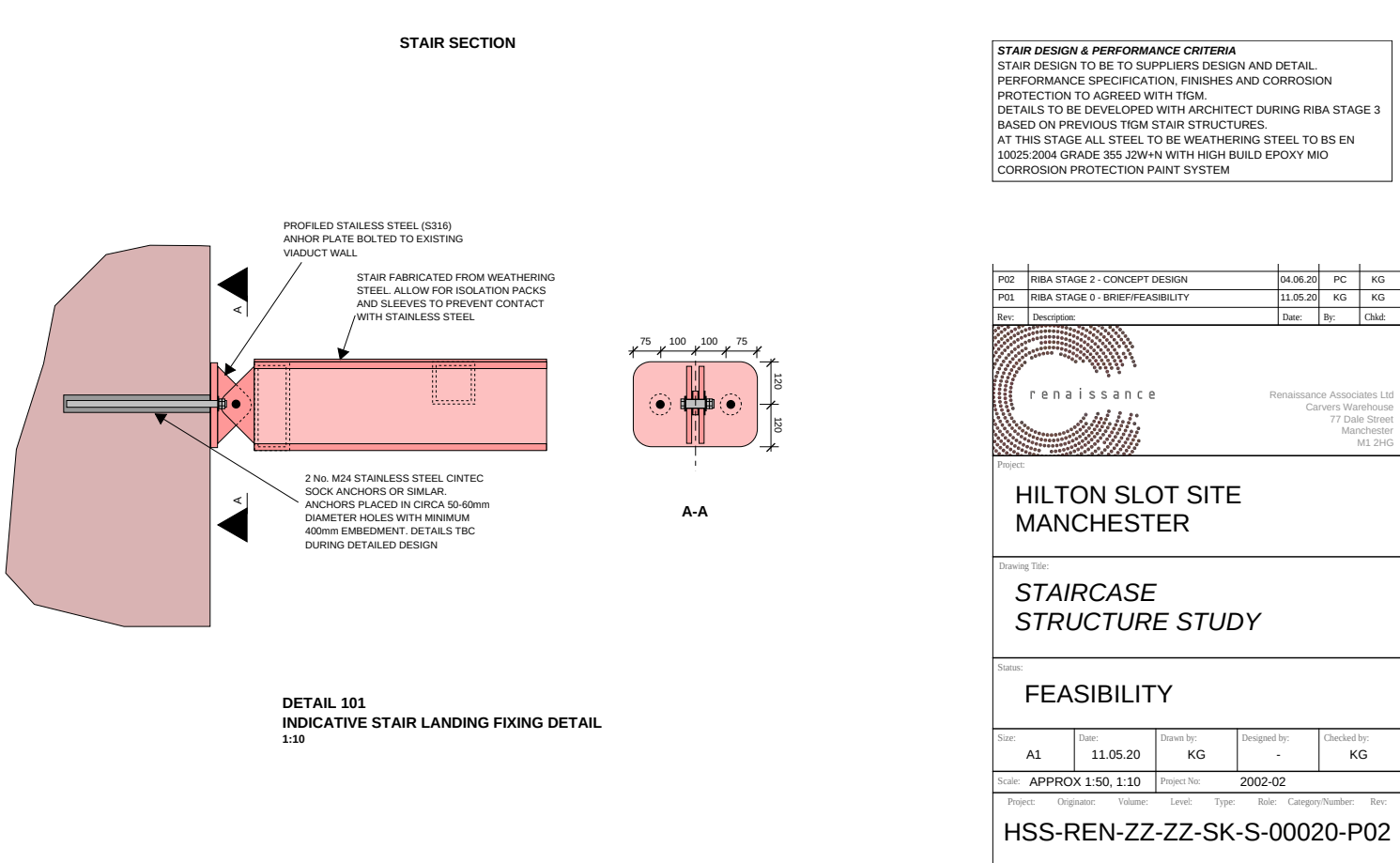
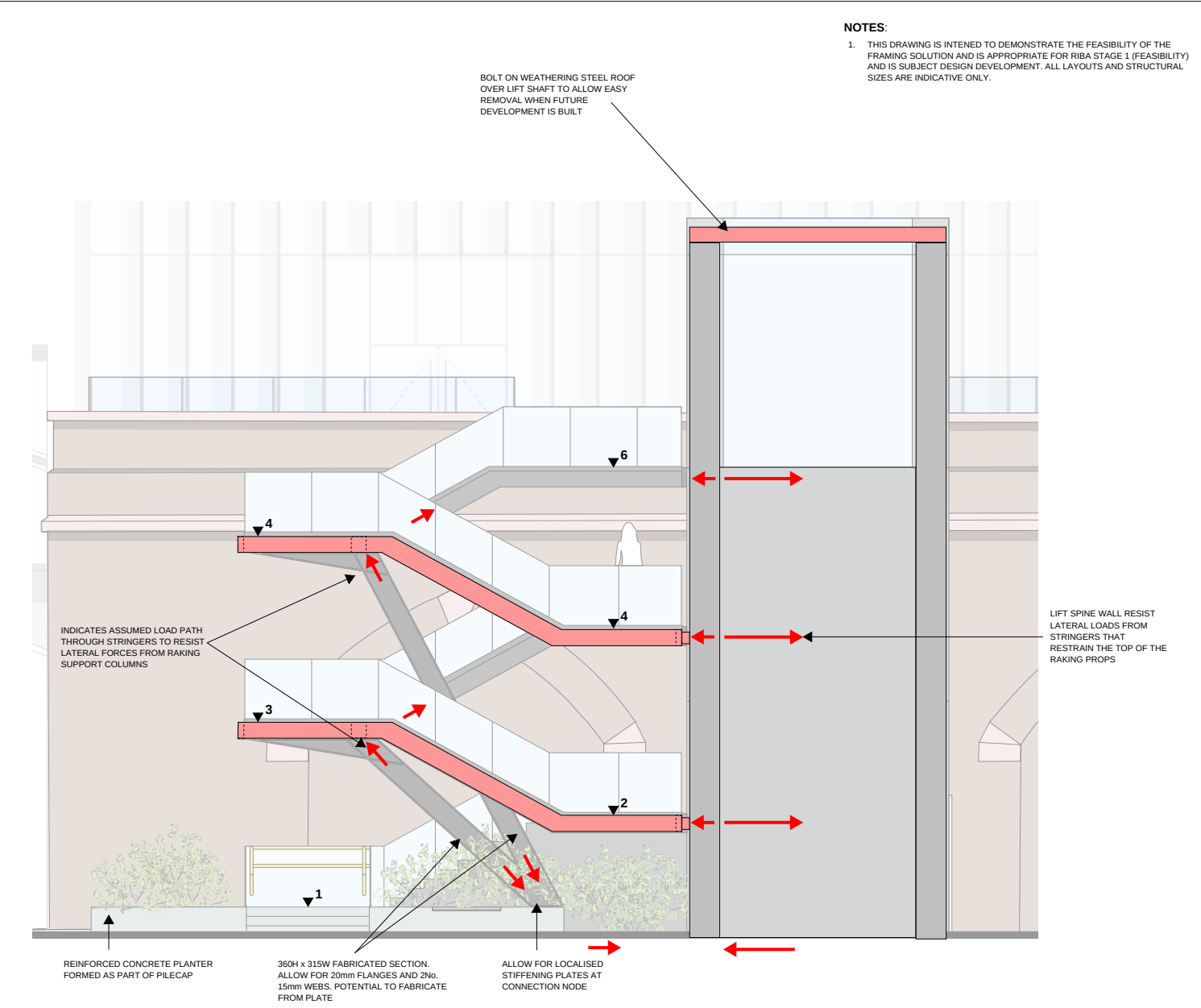
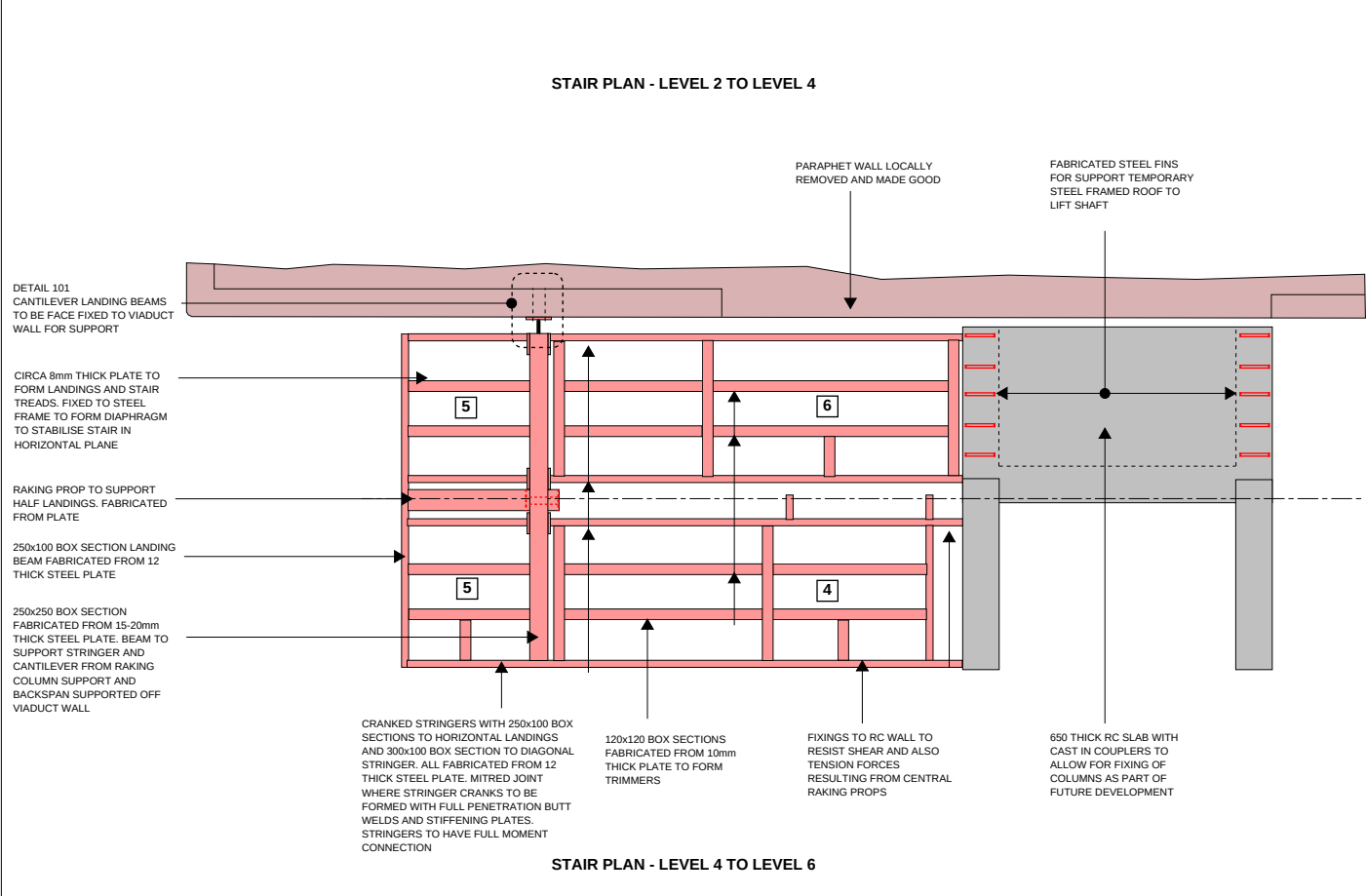
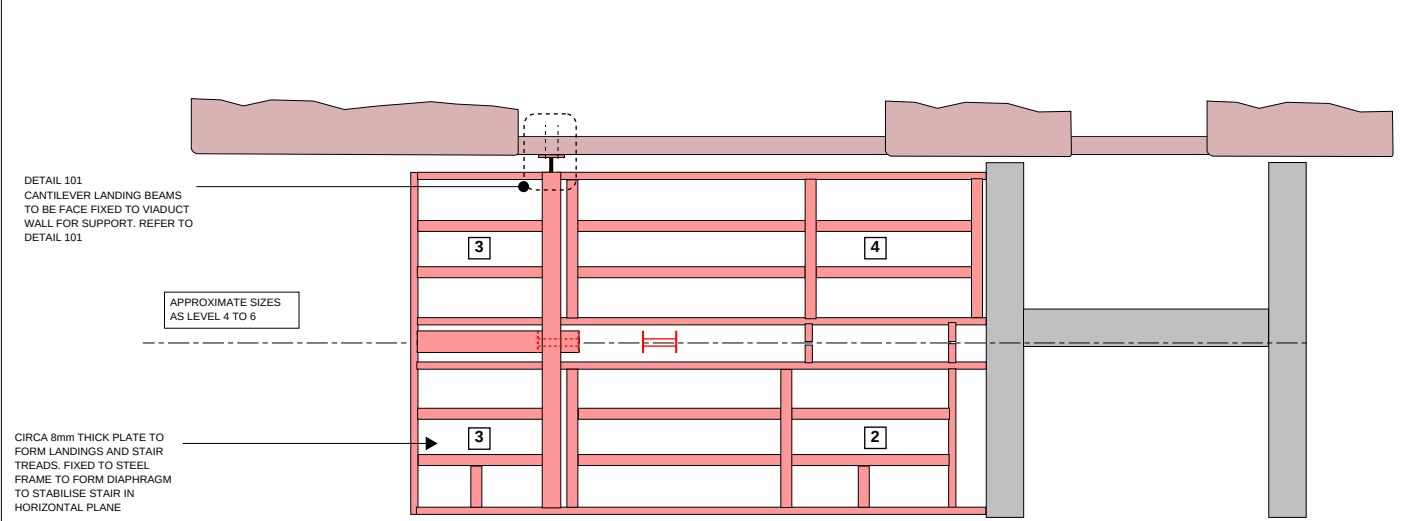
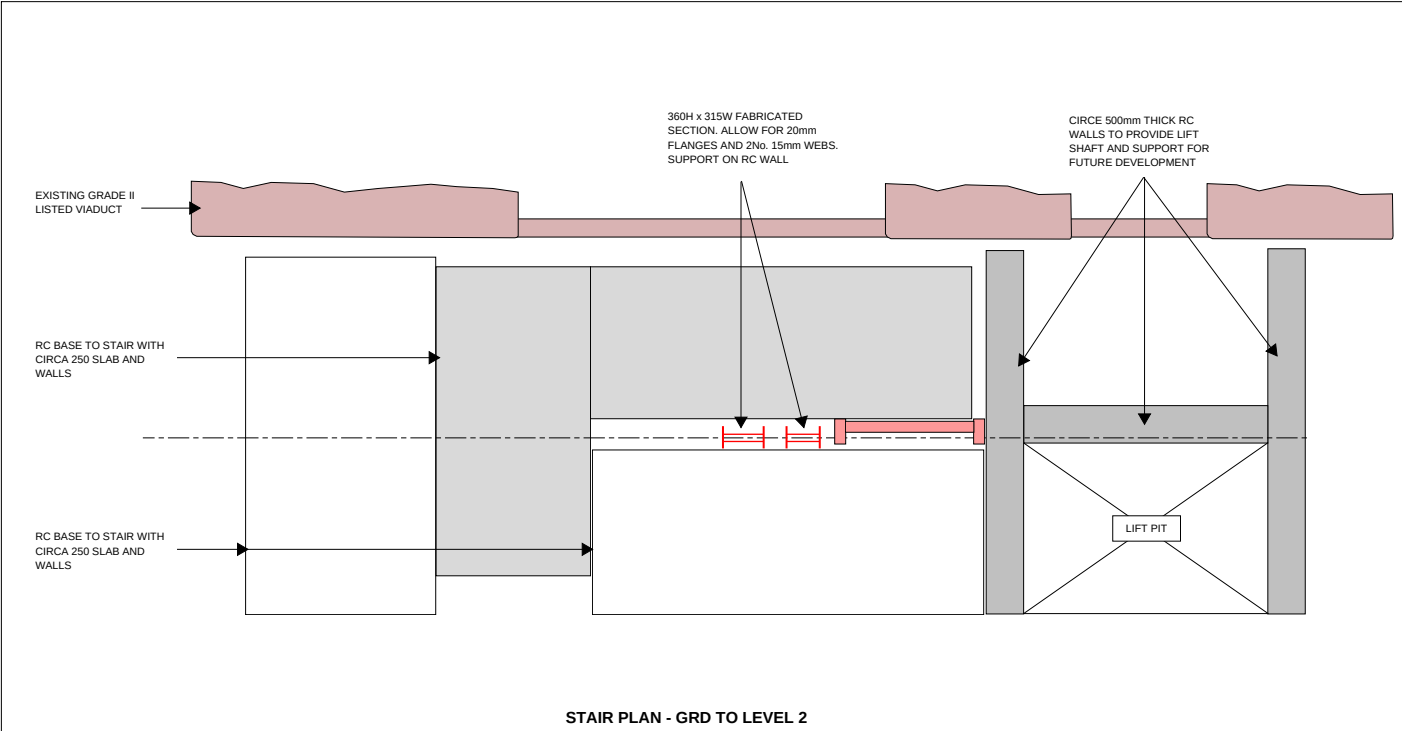
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Project:	Originator:	Volume:	Level:	Type:	Rate:	Category/Number:	Rev:
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VIA-REN-A-ZZ-DR-S-02303-P01

APPENDIX D

STAIR STUDY



NOTES:
1. THIS DRAWING IS INTENDED TO DEMONSTRATE THE FEASIBILITY OF THE FRAMING SOLUTION AND IS APPROPRIATE FOR RIBA STAGE 1 (FEASIBILITY) AND IS SUBJECT DESIGN DEVELOPMENT. ALL LAYOUTS AND STRUCTURAL SIZES ARE INDICATIVE ONLY.

STAIR DESIGN & PERFORMANCE CRITERIA
STAIR DESIGN TO BE TO SUPPLIERS DESIGN AND DETAIL. PERFORMANCE SPECIFICATION, FINISHES AND CORROSION PROTECTION TO AGREED WITH TIGM. DETAILS TO BE DEVELOPED WITH ARCHITECT DURING RIBA STAGE 3 BASED ON PREVIOUS TIGM STAIR STRUCTURES. AT THIS STAGE ALL STEEL TO BE WEATHERING STEEL TO BS EN 10025:2004 GRADE 355 J2W+N WITH HIGH BUILD EPOXY MIO CORROSION PROTECTION PAINT SYSTEM

P02	RIBA STAGE 2 - CONCEPT DESIGN	04.06.20	PC	KG
P01	RIBA STAGE 0 - BRIEF/FEASIBILITY	11.05.20	KG	KG
Rev:	Description:	Date:	By:	Chkd:

renaissance

Renaissance Associates Ltd

Carvers Warehouse

77 Dale Street

Manchester

M1 2HG

Project:

HILTON SLOT SITE

MANCHESTER

Drawing Title:

STAIRCASE

STRUCTURE STUDY

Status:

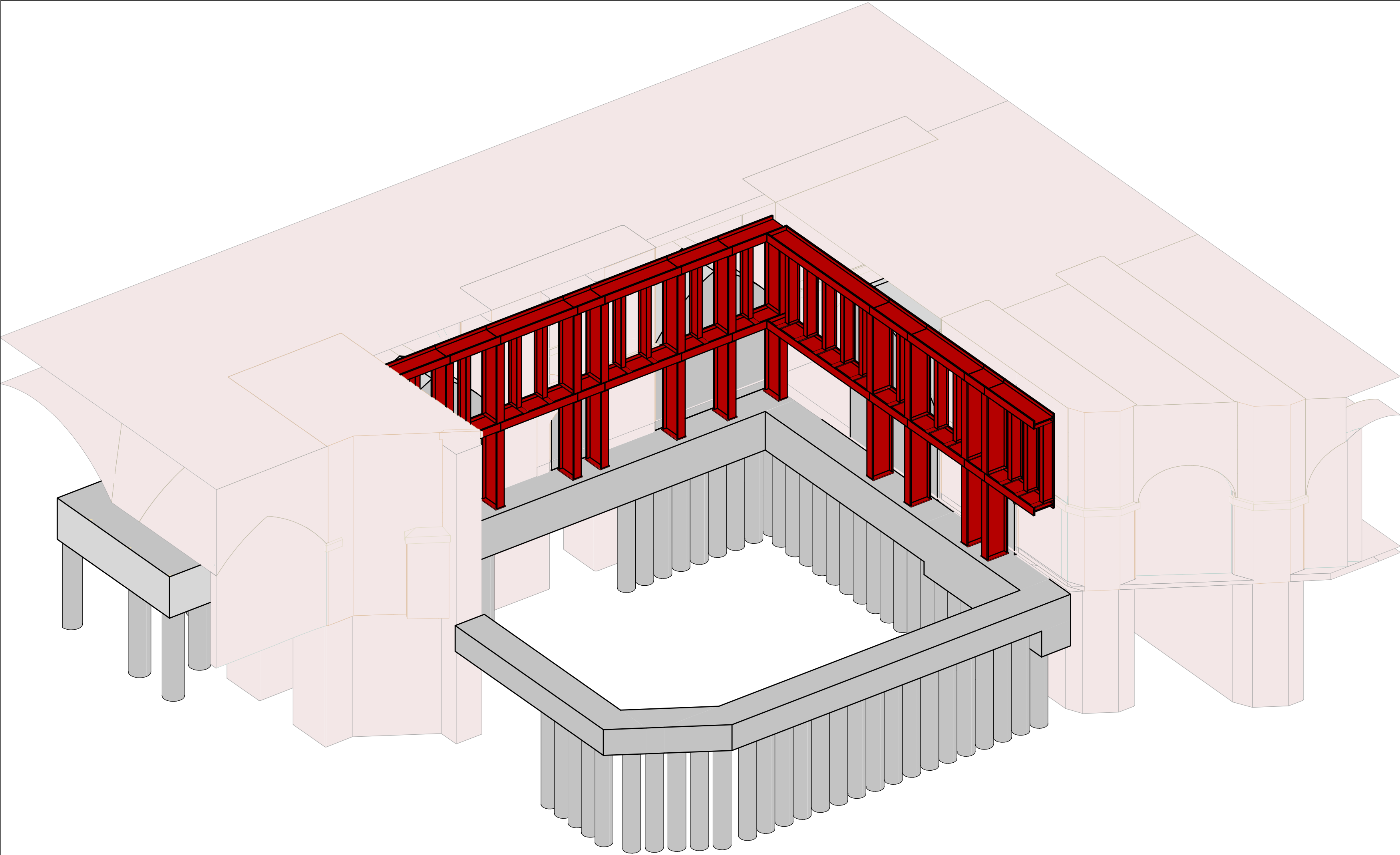
FEASIBILITY

Size:	A1	Date:	11.05.20	Drawn by:	KG	Designed by:	-	Checked by:	KG
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Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:		

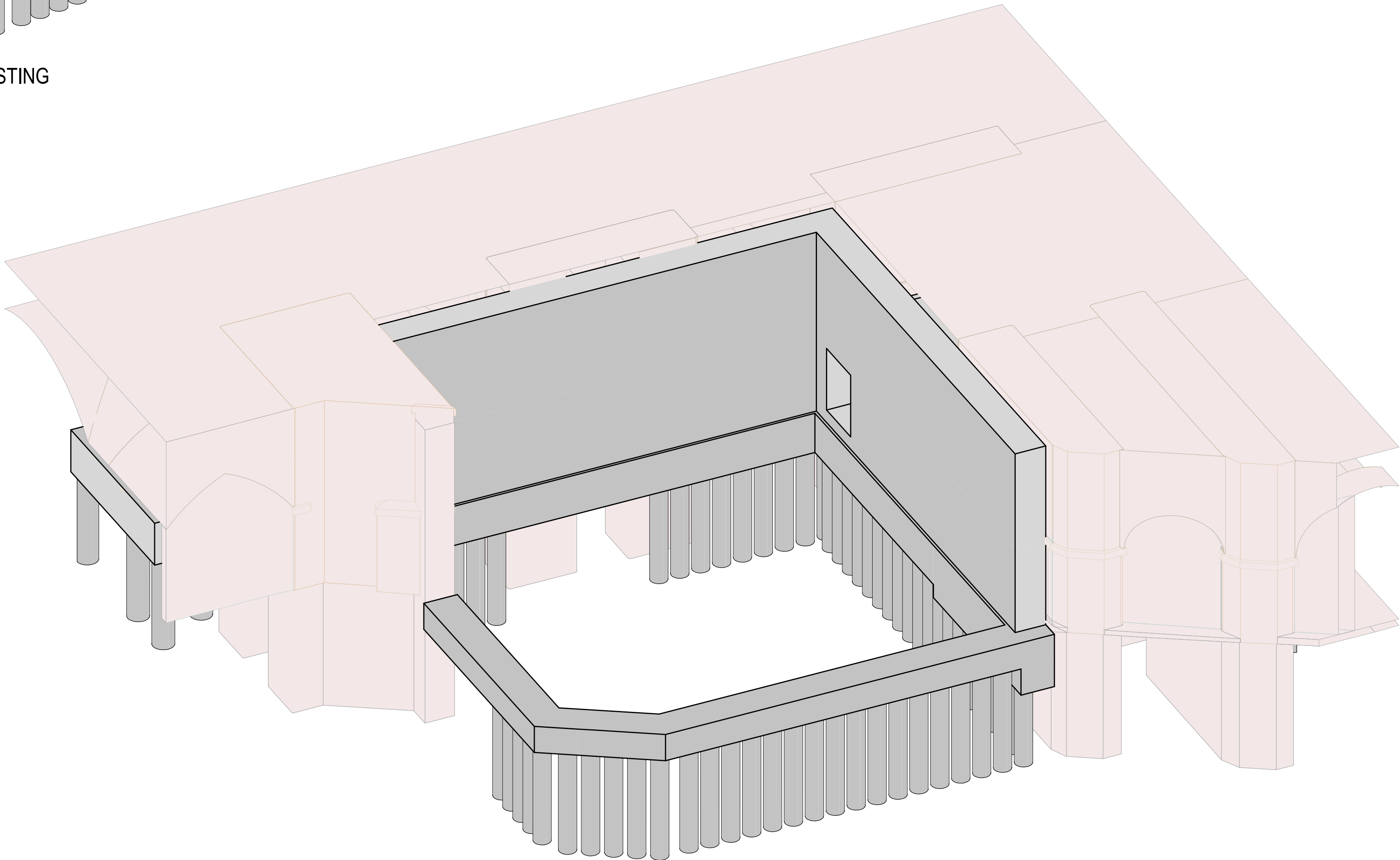
HSS-REN-ZZ-ZZ-SK-S-00020-P02

APPENDIX E

ABUTMENT REMOVAL WORKS DRAWINGS



3D VIEW 1 WITH EXISTING
ARCHES



3D VIEW 2 WITH EXISTING
ARCHES

- NOTES:
1. REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES
 2. REFER TO DRAWING V12-REN-AA-FN-DR-S-04090 FOR HAZARD RISKS NOTES/DESCRIPTIONS.
 3. REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR CONCRETE SCHEDULES
 4. REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR TYPICAL NOTES
 5. REFER TO DRAWING V12-REN-AA-FN-DR-S-04101 FOR STEELWORK SCHEDULES & STEELWORK NOTES

RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

P02	UPDATED TO SUIT REVISED STRATEGY	10/12/21	AM	PC
P01	STAGE 3 UPDATE	30/11/21	AM	PC
Rev:	Description:	Date:	By:	Chkd:



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Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project:
**VIADUX PHASE 2
MANCHESTER**

Drawing Title:
**ABUTMENT REMOVAL WORKS
3D VIEW SHEET 1**

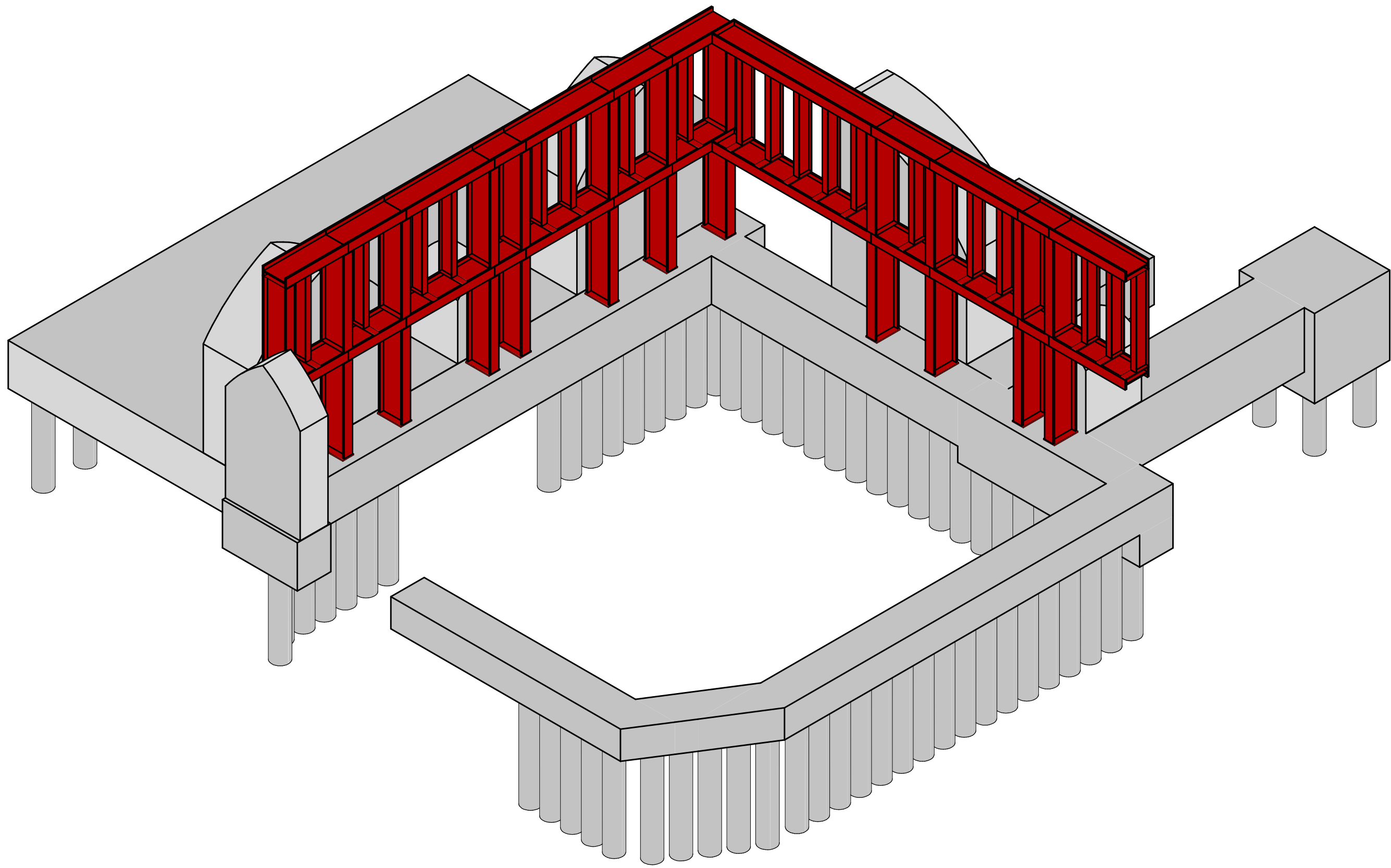
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RIBA STAGE 3

Size:	Date:	Drawn By:	Designed By:	Checked By:
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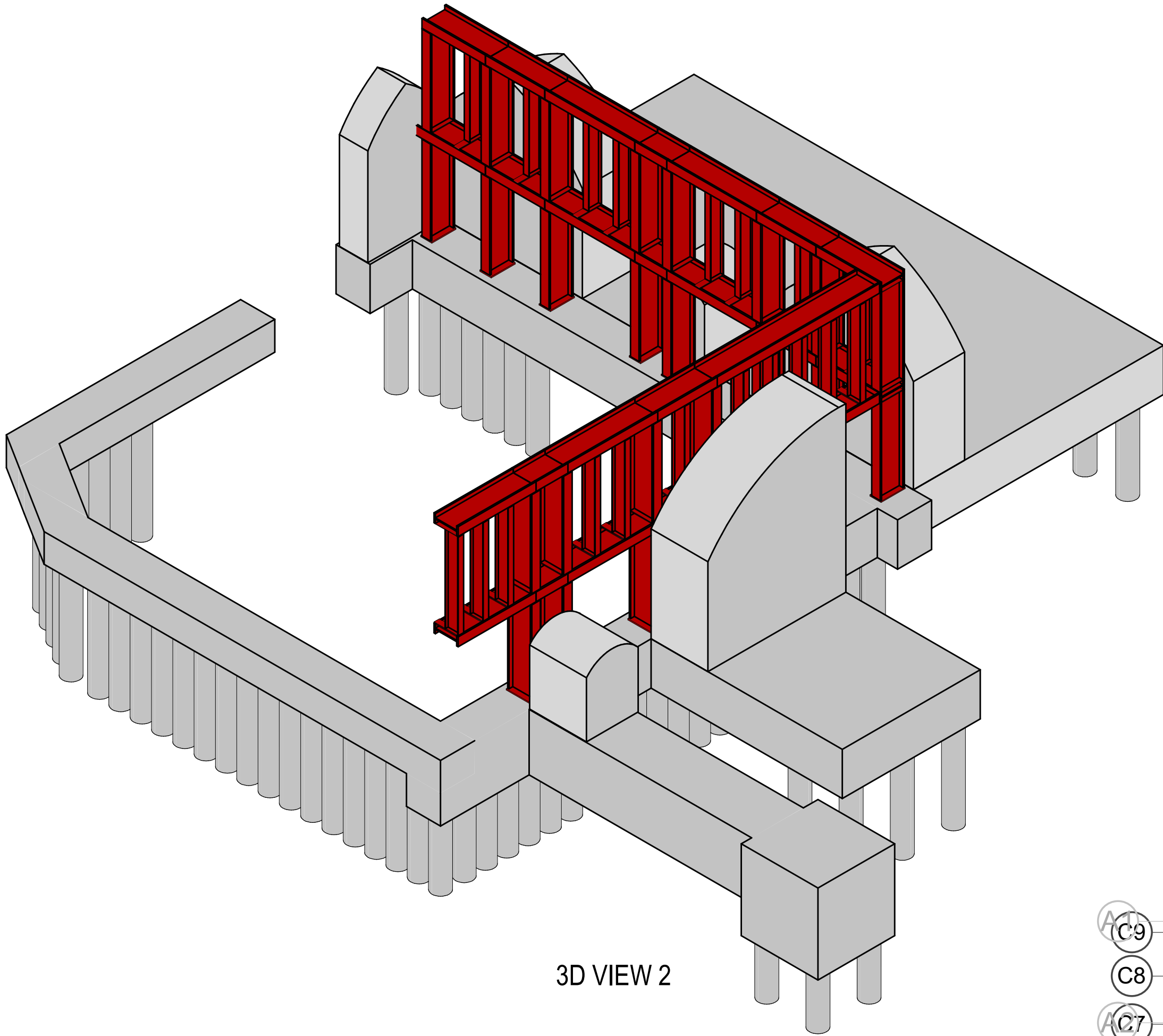
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Project Code: Originator: Volume: Level: Type: Role: Category / Number: Rev:

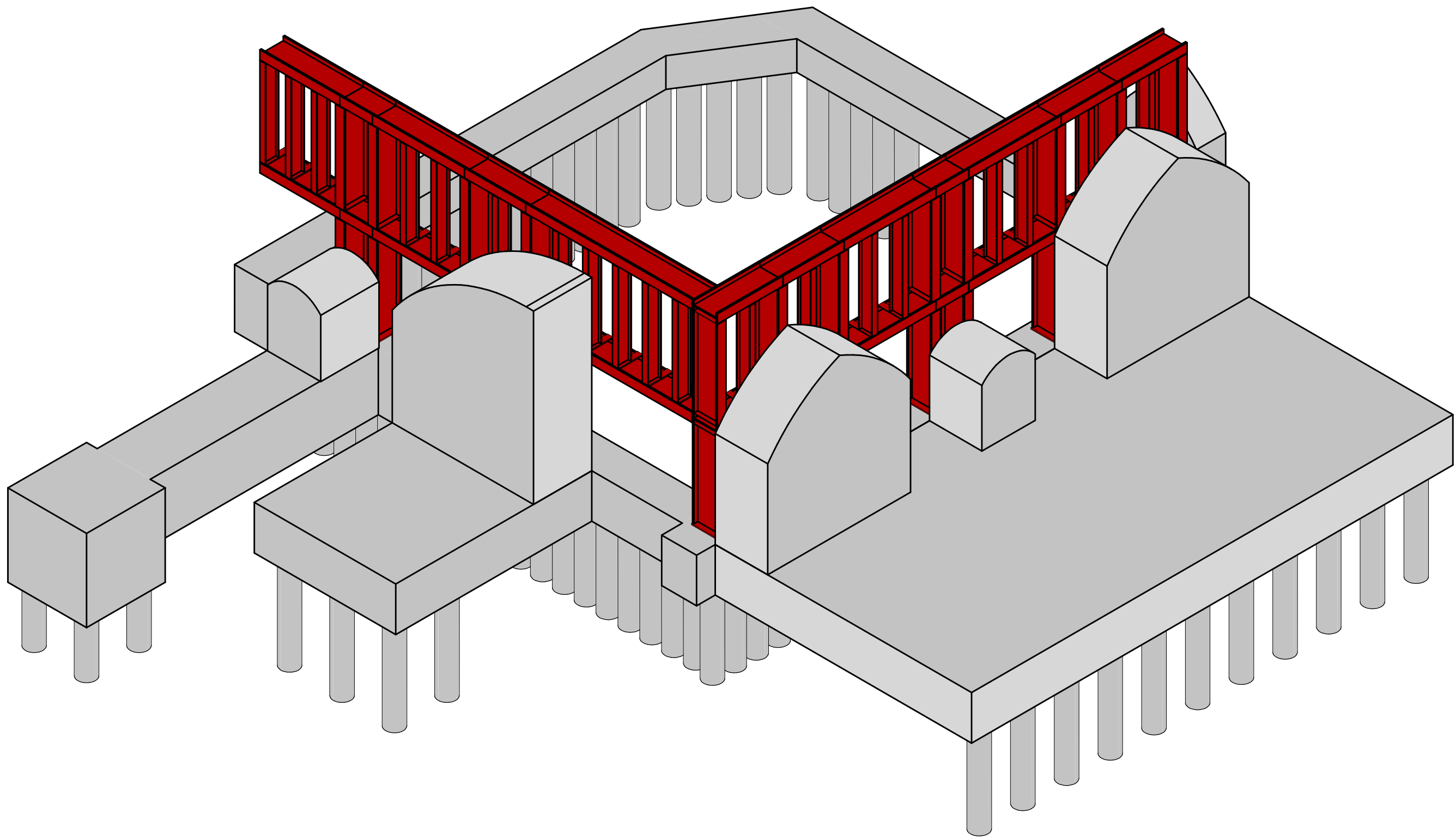
V12 - REN - AA -XX -DR - S - 04500 - P02



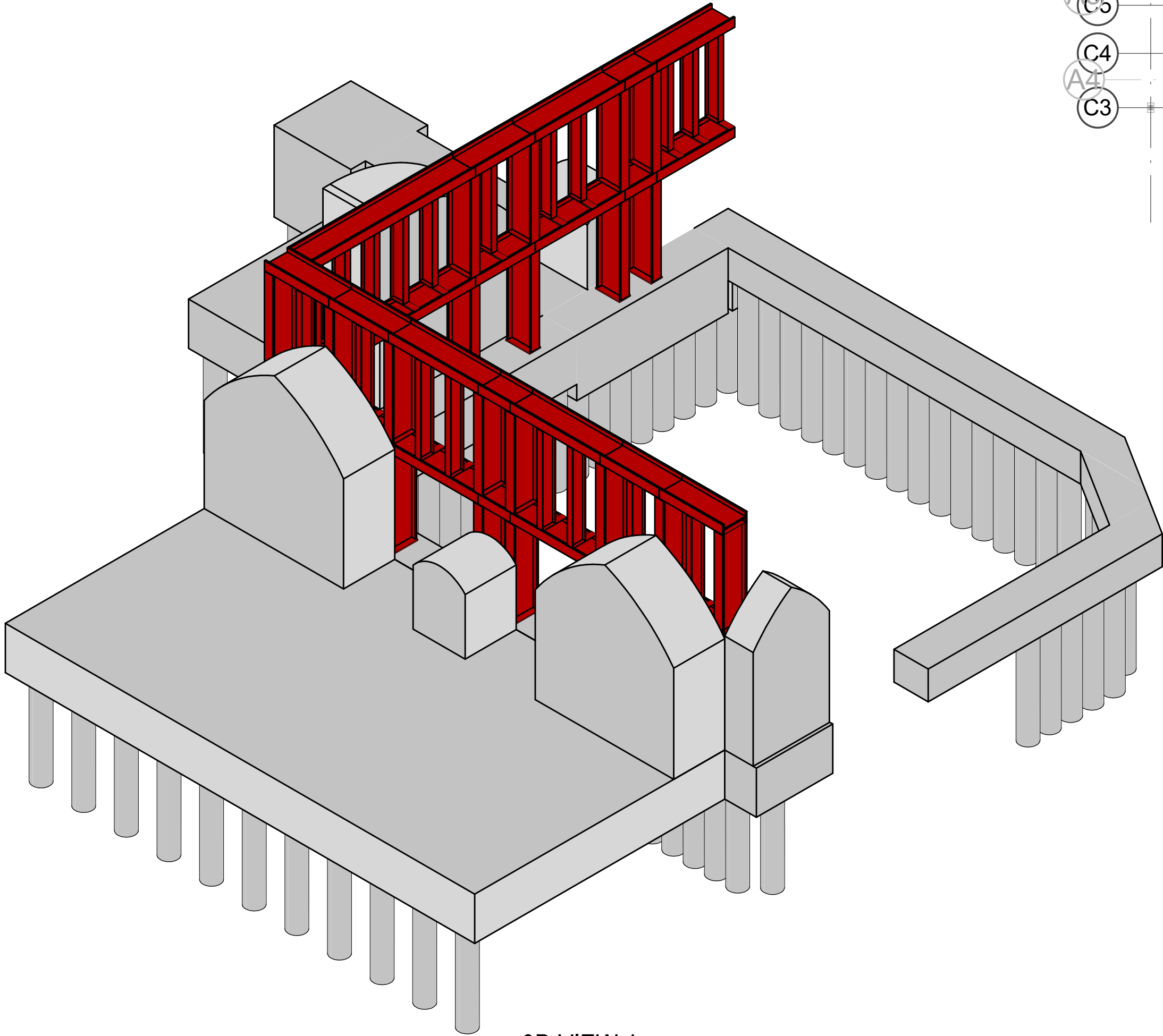
3D VIEW 1



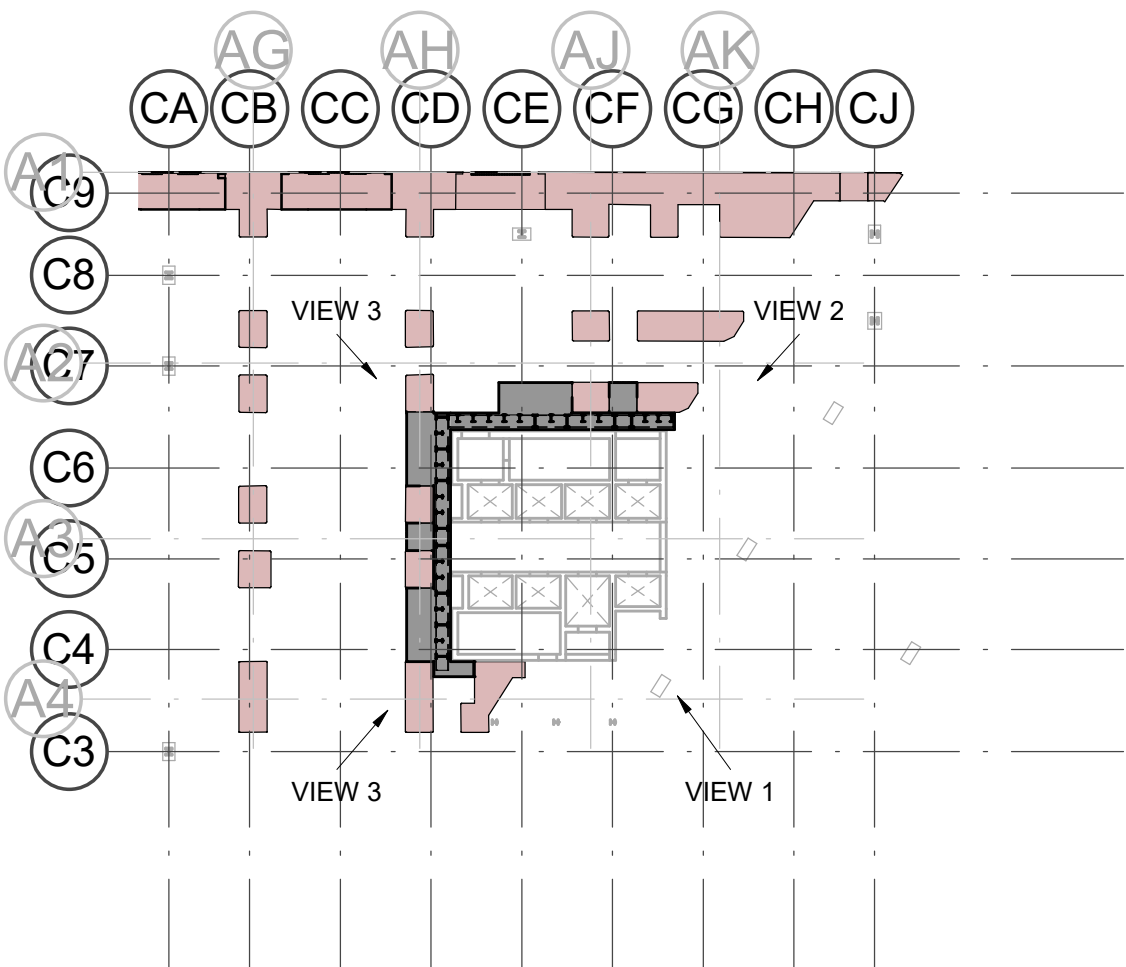
3D VIEW 2



3D VIEW 3



3D VIEW 4



KEY

RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

P01	UPDATED TO SUIT REVISED STRATEGY	10/12/21	AM	PC
Rev:	Description:	Date:	By:	Chkd:



Project:
**VIADUX PHASE 2
MANCHESTER**

Drawing Title:
**ABUTMENT REMOVAL WORKS
3D VIEW SHEET 2**

Status:

RIBA STAGE 3

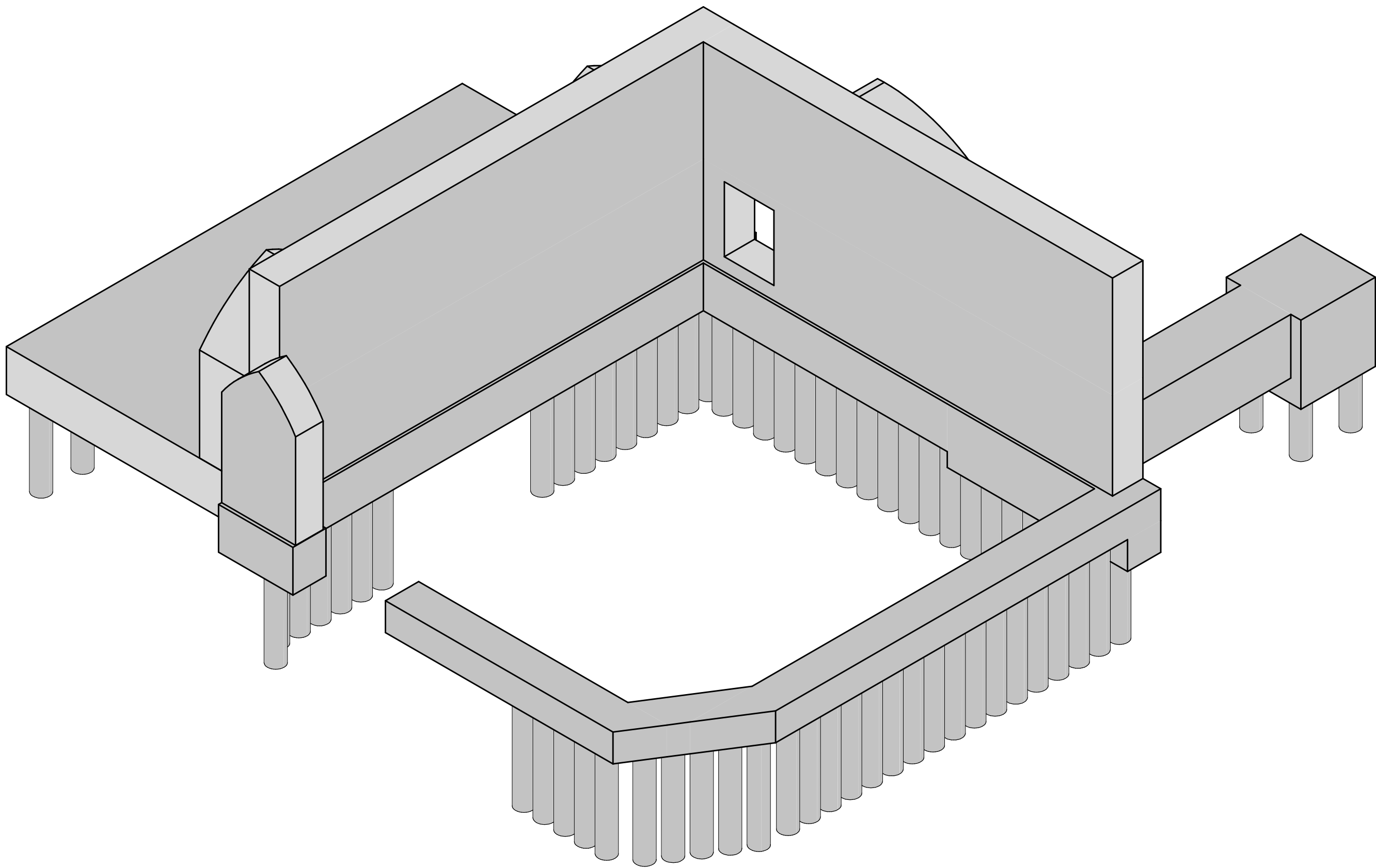
Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	08.12.21	AM	PC	PC

Scale:	1 : 500	Project No:	2102-09
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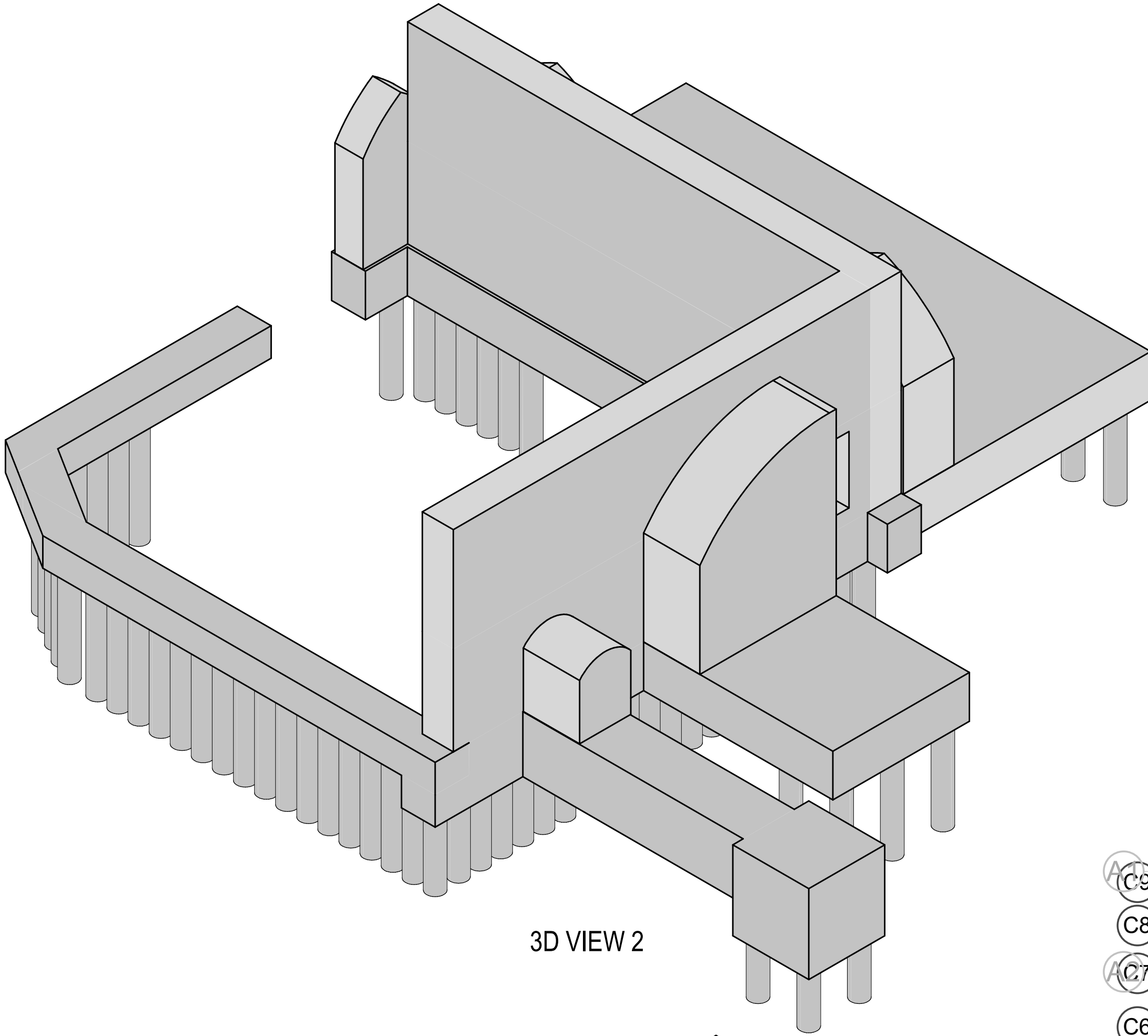
Project Code:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
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VI2 - REN - AA -XX -DR - S - 04501 - P01

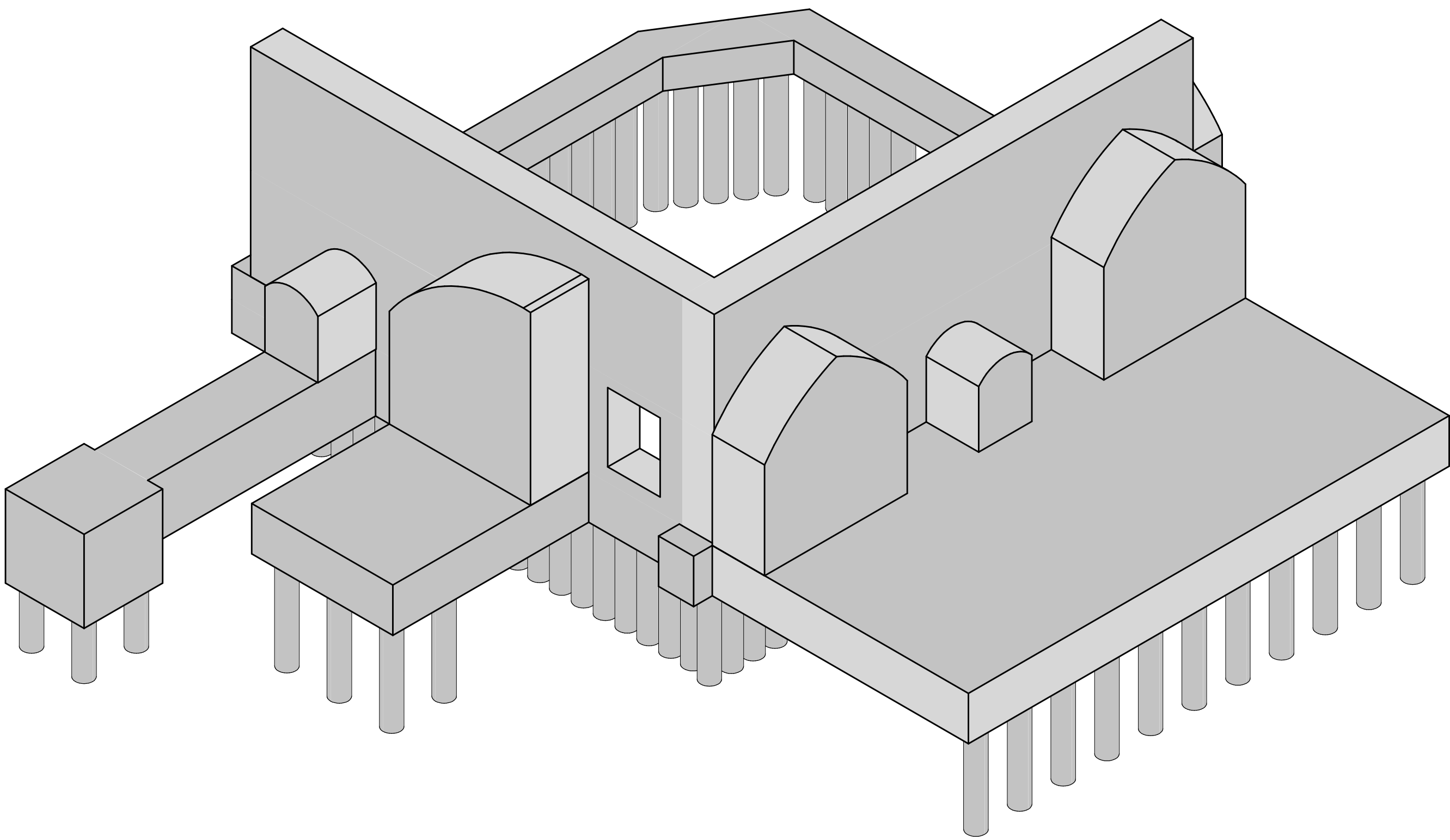
- NOTES:**
1. REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
 2. REFER TO DRAWING VI2-REN-AA-FN-DR-S-04090 FOR HAZARD RISKS NOTES/DESCRIPTIONS.
 3. REFER TO DRAWING VI2-REN-AA-FN-DR-S-04100 FOR CONCRETE SCHEDULES
 4. REFER TO DRAWING VI2-REN-AA-FN-DR-S-04100 FOR TYPICAL NOTES
 5. REFER TO DRAWING VI2-REN-AA-FN-DR-S-04101 FOR STEELWORK SCHEDULES & STEELWORK NOTES



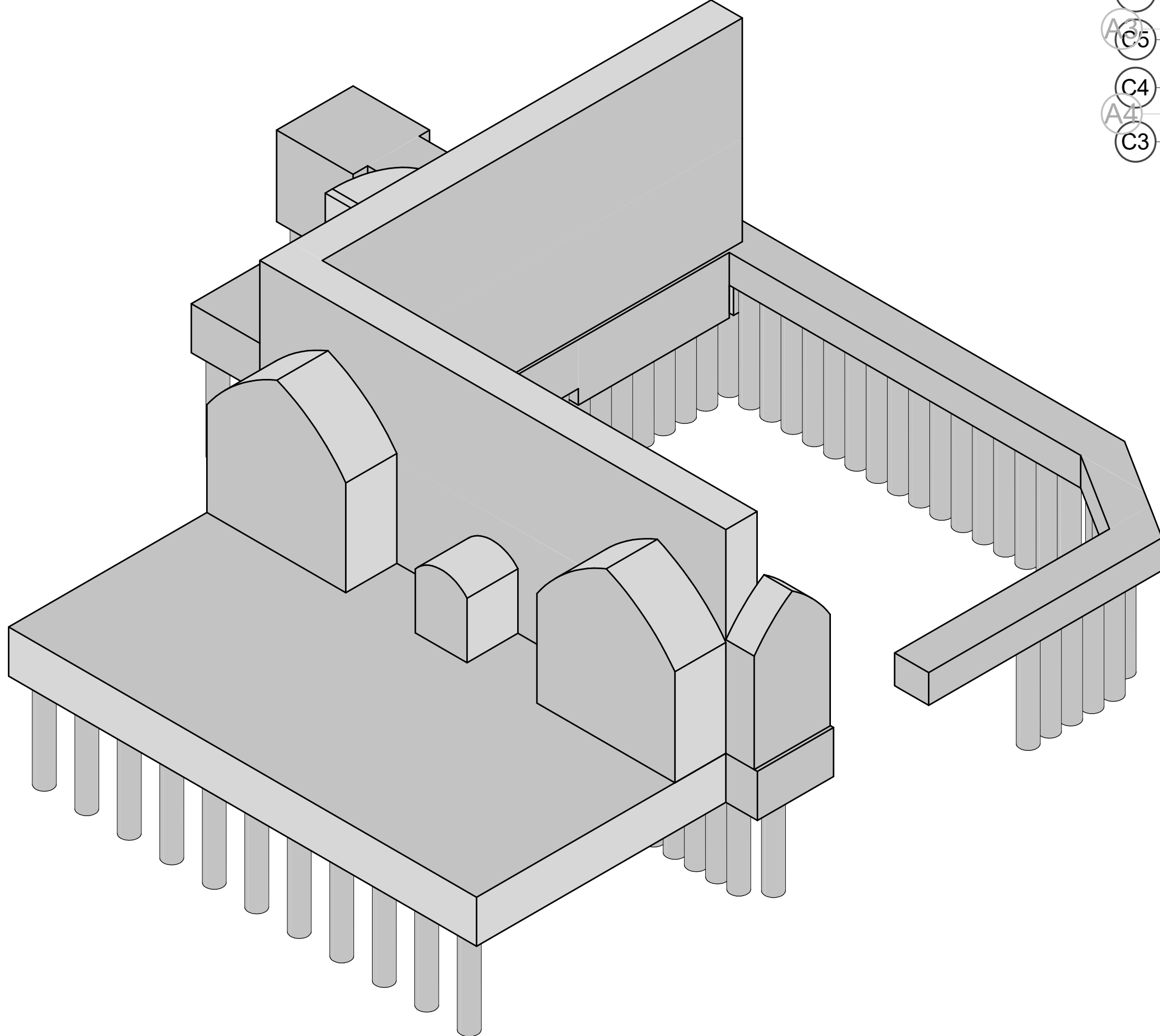
3D VIEW 1



3D VIEW 2



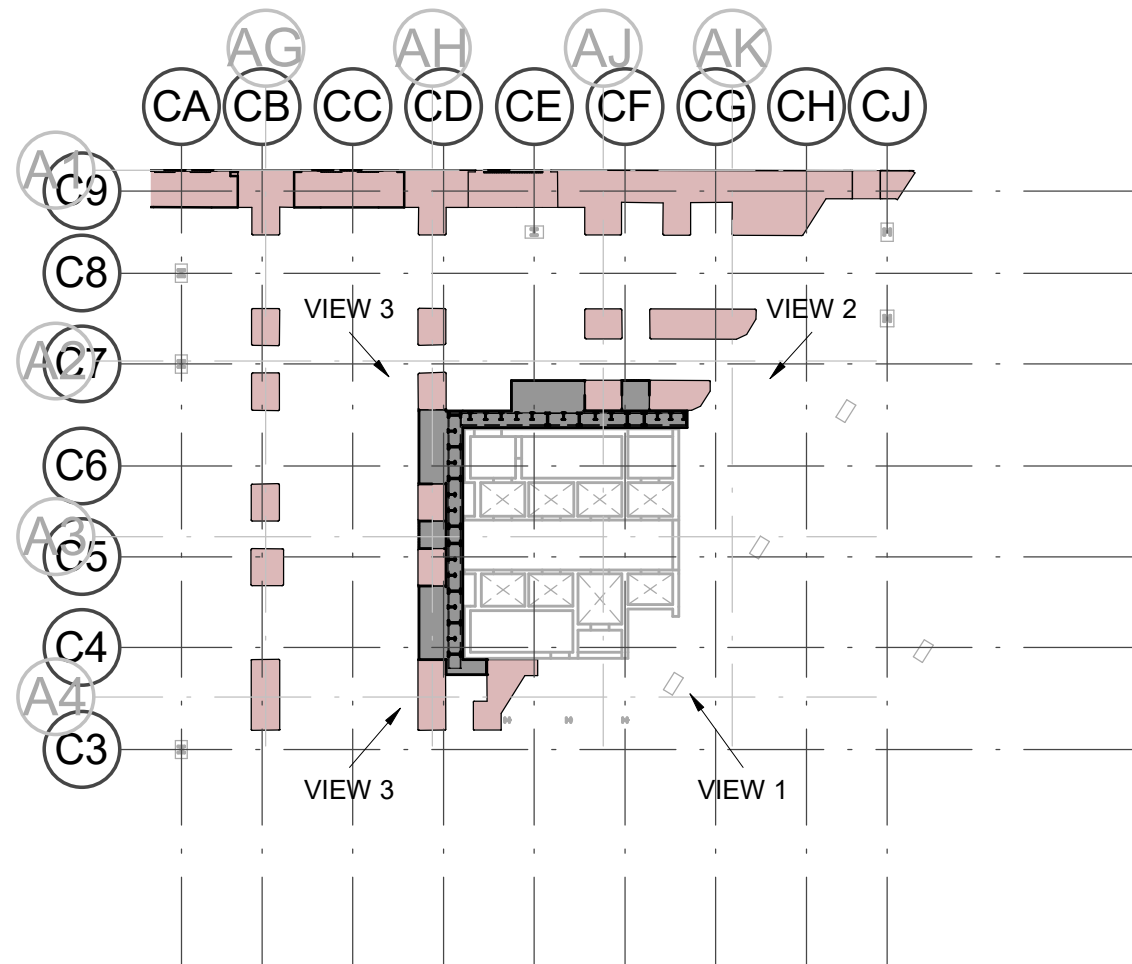
3D VIEW 3



3D VIEW 4

NOTES:

1. REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES.
2. REFER TO DRAWING V12-REN-AA-FN-DR-S-04090 FOR HAZARD RISKS NOTES/DESCRIPTIONS.
3. REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR CONCRETE SCHEDULES
4. REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR TYPICAL NOTES
5. REFER TO DRAWING V12-REN-AA-FN-DR-S-04101 FOR STEELWORK SCHEDULES & STEELWORK NOTES



KEY

RIBA STAGE 3
ALL STRUCTURAL SIZES ARE INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT QUANTITY SURVEYOR AND CONTRACTOR. ALL STRUCTURAL SIZES AND REINFORCEMENT RATES ARE INDICATIVE AT THIS STAGE AND ARE SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGNED PACKAGES.

P01	UPDATED TO SUIT REVISED STRATEGY	10/12/21	AM	PC
Rev:	Description:	Date:	By:	Chkd:



Project:
**VIADUX PHASE 2
MANCHESTER**

Drawing Title:
**ABUTMENT REMOVAL WORKS
3D VIEW SHEET 3**

Status:

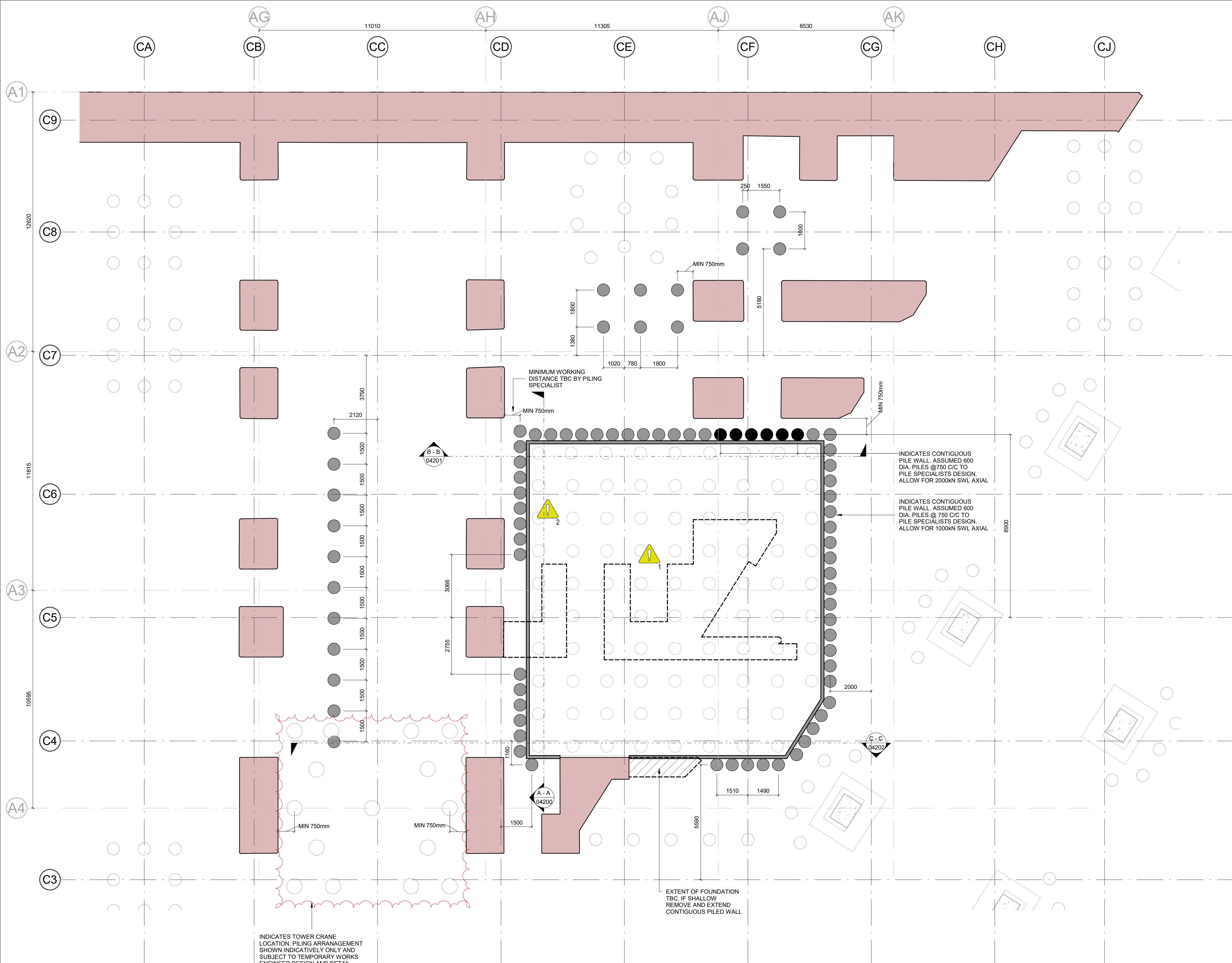
RIBA STAGE 3

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	08.12.21	AM	PC	KG

Scale:	1 : 500	Project No:	2102-09
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Project Code:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
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V12 - REN - AA - XX - DR - S - 04502 - P01



- NOTES:
- REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04090 FOR HAZARD RISKS NOTES/DESCRIPTIONS
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR CONCRETE SCHEDULES
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR TYPICAL NOTES
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04101 FOR STEELWORK SCHEDULES & STEELWORK NOTES
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH PILE SCHEDULE V12-REN-AA-FN-SH-S-04080 AND THE LATEST EDITION OF THE ICE SPECIFICATION FOR PILING AND EMBEDDED RETAINING WALLS. THE PROJECT SPECIFIC PILING SPECIFICATION AND ASSOCIATED DOCUMENTS, DRAWINGS AND SCHEDULES

- KEY
- INDICATES 600 DIA. BEARING PILE
 - INDICATES 600 DIA. @ 750 CENTRES CONTIGUOUS PILED WALL

HEALTH AND SAFETY NOTES:
IN ADDITION TO THE HAZARDS AND RISKS NORMALLY ASSOCIATED WITH WORKS OF THIS NATURE, NOTE THE FOLLOWING ABNORMAL RISKS IDENTIFIED

- 1 EXISTING VIADUCT STRUCTURE MARKED FOR DEMOLITION WILL REMAIN IN SITU DURING PILING. ACCESSIBILITY TO BE ASSESSED BY PILING CONTRACTOR.
- 2 RISK OF STRIKING BURIED SERVICES AND REMNANT FOUNDATIONS DURING PILING AND EXCAVATION WORKS. PILE LOCATIONS TO BE SCANNED AND PROOF DUG TO CLEAR SERVICES AND OBSTRUCTIONS PRIOR TO WORKS
- 3 TEMPORARY WORKS ARE REQUIRED IN ORDER TO FORM EXCAVATIONS AT GROUND FLOOR LEVEL BENEATH THE VIADUCT. REFER TO RENAISSANCE CONSTRUCTION METHODOLOGY DRAWING SERIES 90XXX FOR INDICATIVE CONSTRUCTION SEQUENCE AND TEMPORARY WORKS REQUIREMENTS
- 4 VIBRATION AND MOVEMENT MONITORING REQUIRED DURING WORKS WITHIN ARCHES. REFER TO RENAISSANCE CONSTRUCTION METHODOLOGY DRAWING SERIES 90XXX FOR INDICATIVE CONSTRUCTION SEQUENCE
- 5 GROUND CONDITIONS AND GEO-ENVIRONMENTAL ASSESSMENT TO BE DETERMINED BY SI PILING RISK ASSESSMENT TO BE PRODUCED AND SUBMITTED FOR COMMENT. SITE REMEDIATION STRATEGY REPORT TO BE SUBMITTED FOR COMMENT.
NOTE: PILING CONTRACTORS CONCRETE MIX DESIGN IS TO BE SUITABLE FOR ACEC CLASS AC-1s AND SULPHATE CLASS DS-3 IN ACCORDANCE WITH THE BRE SPECIAL DIGEST 1 "CONCRETE IN AGGRESSIVE GROUND 2005"
- 6 MAXIMUM PERMITTED SETTLEMENT OF EXISTING VIADUCT TO CONTROL CRACKING TRO GRADE II VIADUCT DIFFERENTIAL SETTLEMENT BETWEEN PEIRS TO BE LIMITED TO 9mm ($\Delta < 1/1000$)
- 7 DEEP REBAR CAGES REQUIRED FOR PILED RAFT FOUNDATIONS. ANY ADDITIONAL REBAR REQUIRED FOR TEMPORARY SUPPORT OF REINFORCEMENT CAGE UPPER LAYERS. INCLUDING VERTICAL SUPPORT AND BRACING CUT FOR STABILITY TO BE DESIGNED AND DETAILED BY RC FRAME CONTRACTOR
- 8 LARGE AND HEAVY REBAR CAGES ARE REQUIRED. RC FRAME CONTRACTOR TO CONSIDER TEMPORARY STABILITY OF CAGES IN CONSTRUCTION SEQUENCE AND PROVIDE APPROPRIATE TEMPORARY SUPPORT WORKS AND/OR METHODS OR PROTECTING CAGES FROM ACCIDENTAL IMPACTS FROM SITE PLANT
- 9 TEMPORARY WORKS DESIGN REQUIRED FOR RESTRAINT OF FORMWORK FOR DEEP CONCRETE POURS. TEMPORARY WORKS DESIGN TO RC FRAME CONTRACTORS DESIGN AND DETAIL

INITIAL PILE DESIGN
CUT OFF LEVEL +33.925

90 NO. PILES OF $\phi 600$ DIA REQUIRED, OF WHICH 69 ARE CONTIGUOUS PILES. PILE LENGTH IS TO BE CONFIRMED BY PILING CONTRACTOR.

PILE DESIGN IS BASED ON SWL OF 4,200 kN (VERTICAL) AND 300kN (COMBINED SHEAR) OF PILES BASED ON INITIAL DISCUSSIONS WITH THE PILING CONTRACTOR OF PHASE 1 OF THE DEVELOPMENT.

CONTIGUOUS PILE DESIGN IS BASED ON AN ASSUMED SWL OF 3,000kN (VERTICAL) AND 300kN (COMBINED SHEAR) OF PILES, TO BE CONFIRMED BY PILING CONTRACTOR.

RIBA STAGE 3
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P03	UPDATED TO SUIT REVISED STRATEGY	10/12/21	AM	PC
P02	STAGE 3 UPDATE	30/11/21	AM	PC
P01	STAGE 3 ISSUE	29/10/21	RW	KG
Rev:	Description:	Date:	By:	Chk:



Project:
**VIADUX PHASE 2
MANCHESTER**

Drawing Title:
**ABUTMENT REMOVAL WORKS
PILE GENERAL ARRANGEMENT**

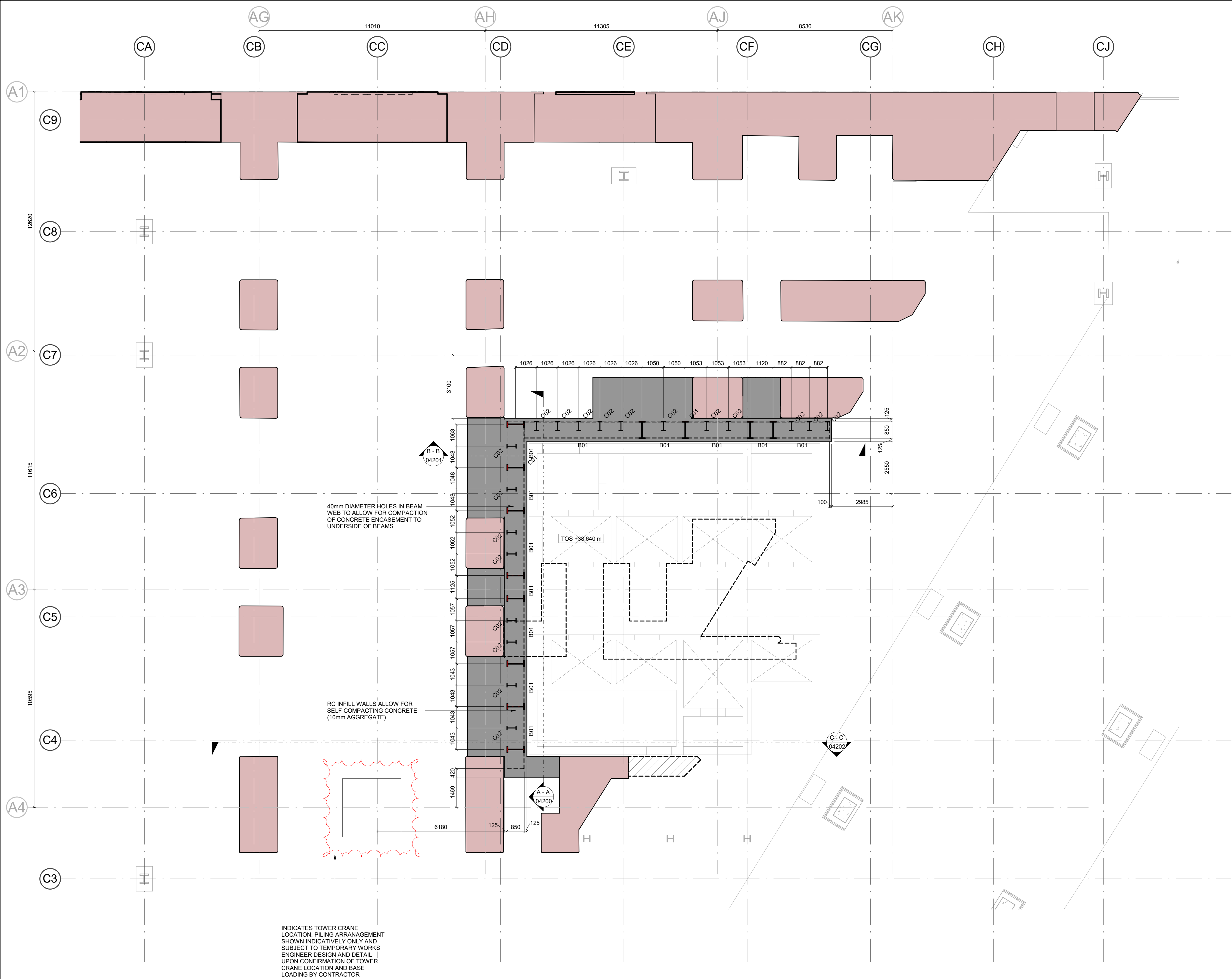
Status:
RIBA STAGE 3

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	19.10.21	NC	RW	KG
Scale:	1 : 100	Project No:	2102-09	

Project Code: Originator: Volume: Level: Type: Role: Category / Number: Rev:

V12 - REN - AA - FN - DR - S - 04090 - P03

Model: NameXXXXXXXX-REN-ZZ-XX-03-S-00001



- NOTES:
- REFER TO DRAWING VI2-REN-00-XX-DR-S-00010 FOR GENERAL NOTES
 - REFER TO DRAWING VI2-REN-AA-FN-DR-S-04090 FOR HAZARD RISKS NOTES/DESCRIPTIONS.
 - REFER TO DRAWING VI2-REN-AA-FN-DR-S-04100 FOR CONCRETE SCHEDULES
 - REFER TO DRAWING VI2-REN-AA-FN-DR-S-04100 FOR TYPICAL NOTES
 - REFER TO DRAWING VI2-REN-AA-FN-DR-S-04101 FOR STEELWORK SCHEDULES & STEELWORK NOTES
 - EXECUTION CLASS TO BE EXC 3 TO BS EN 1090-2
 - ALL STEEL GRADE S355 J2 UNO

STEELWORK CONNECTIONS
ALL STEELWORK CONNECTIONS ARE INDICATIVE AND ARE INTENDED TO COMMUNICATE THE DESIGN INTENT. CONNECTIONS TO BE TO STEELWORK FABRICATORS DESIGN AND DETAIL BASED ON CONNECTION FORCES THAT WILL BE PROVIDED AT RIBA STAGE 5.

BEAM SCHEDULE (PLATED)				
REF	FABRICATION	HEIGHT (mm)	WIDTH (mm)	FLANGE THICKNESS (mm)
B01	PLATED - ALLOW FOR 10mm CFWs BOTH SIDES	850	300	50

COLUMN SCHEDULE (PLATED)				
REF	FABRICATION	HEIGHT (mm)	WIDTH (mm)	FLANGE THICKNESS (mm)
C01	PLATED - ALLOW FOR 10mm CFWs BOTH SIDES	850	300	50

COLUMN SCHEDULE (ROLLED)	
REF	FABRICATION
C02	ROLLED

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P03	UPDATED TO SUIT REVISED STRATEGY	10/12/21	AM	PC
P02	STAGE 3 UPDATE	30/11/21	AM	PC
P01	STAGE 3 ISSUE	29/10/21	RW	KG

Rev: Description: Date: By: Chkd:



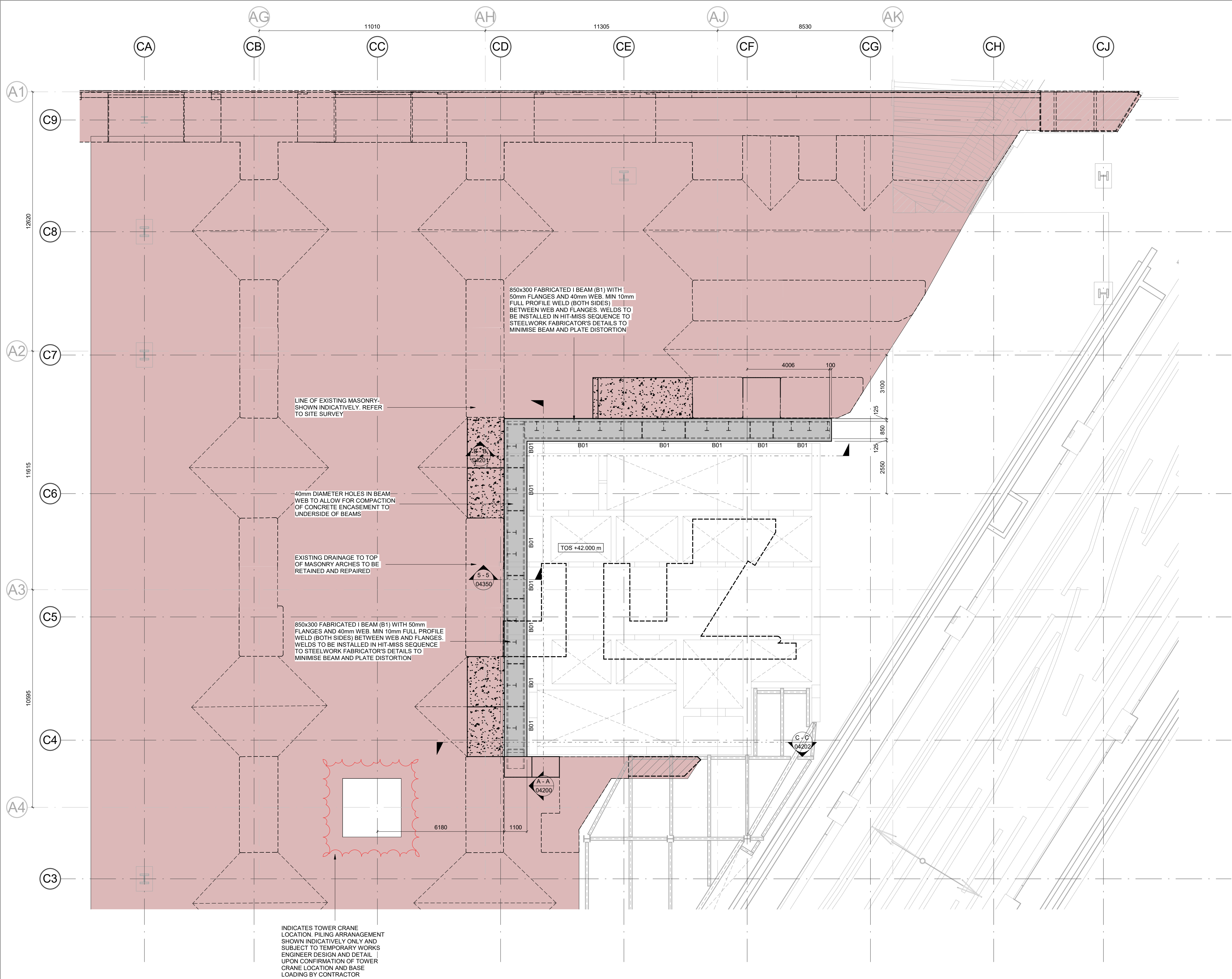
Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project: VIADUX PHASE 2 MANCHESTER

Drawing Title: ABUTMENT REMOVAL WORKS LOWER BEAM GENERAL ARRANGEMENT

Status:				
Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	19.10.21	NC	RW	KG
Scale:	1 : 100	Project No:	2102-09	
Project Code:	Originator:	Volume:	Level:	Type: Role: Category / Number: Rev:
VI2 - REN - AA - 00 - DR - S - 04101 - P03				

Model: NameXXXXXXXX-REN-ZZ-XX-03-S-00001



- NOTES:
- REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04090 FOR HAZARD RISKS NOTES/DESCRIPTIONS.
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR CONCRETE SCHEDULES
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR TYPICAL NOTES
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04101 FOR STEELWORK SCHEDULES & STEELWORK NOTES

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P03	UPDATED TO SUIT REVISED STRATEGY	10/12/21	AM	PC
P02	STAGE 3 UPDATE	30/11/21	AM	PC
P01	STAGE 3 ISSUE	29/10/21	RW	KG
Rev:	Description:	Date:	By:	Chkd:



Project:
**VIADUX PHASE 2
MANCHESTER**

Drawing Title:
**ABUTMENT REMOVAL WORKS
UPPER BEAM GENERAL
ARRANGEMENT**

Status:

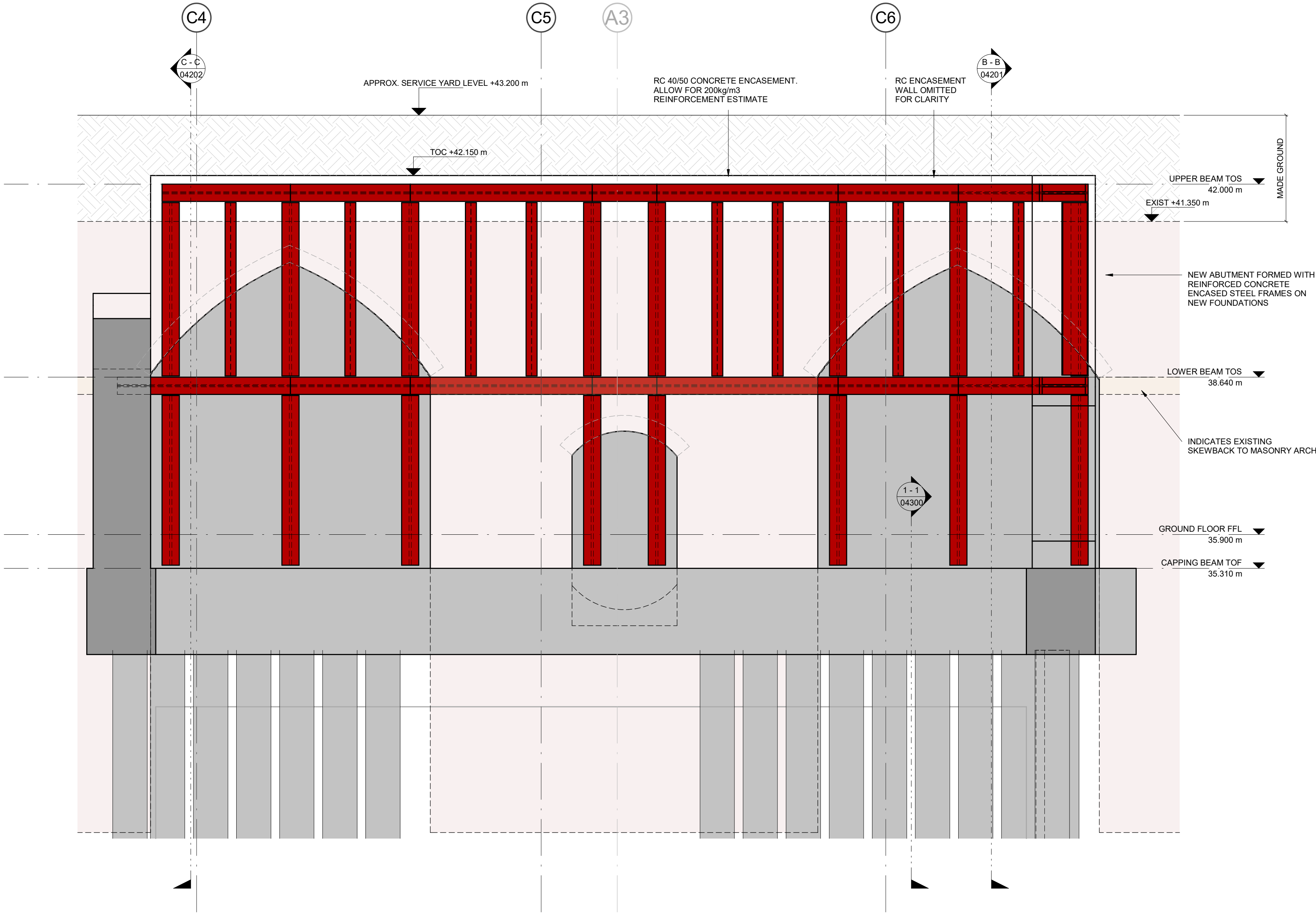
RIBA STAGE 3

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	19.10.21	NC	RW	KG
Scale:	1 : 100	Project No:	2102-09	

Project Code: Originator: Volume: Level: Type: Role: Category / Number: Rev:

V12 - REN - AA - 00 - DR - S - 04102 - P03

Model: NameXXXXXX-REN-ZZ-XX-IM3-S-00001



- NOTES:
1. REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES
 2. REFER TO DRAWING V12-REN-AA-FN-DR-S-04090 FOR HAZARD RISKS NOTES/DESCRIPTIONS.
 3. REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR CONCRETE SCHEDULES
 4. REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR TYPICAL NOTES
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P03	UPDATED TO SUIT REVISED STRATEGY	10/12/21	AM	PC
P02	STAGE 3 UPDATE	30/11/21	AM	PC
P01	STAGE 3 ISSUE	29/10/21	RW	KG

Rev:	Description:	Date:	By:	Chkd:
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Project:
**VIADUX PHASE 2
MANCHESTER**

Drawing Title:
**ABUTMENT REMOVAL WORKS
ELEVATION A-A**

Status:
RIBA STAGE 3

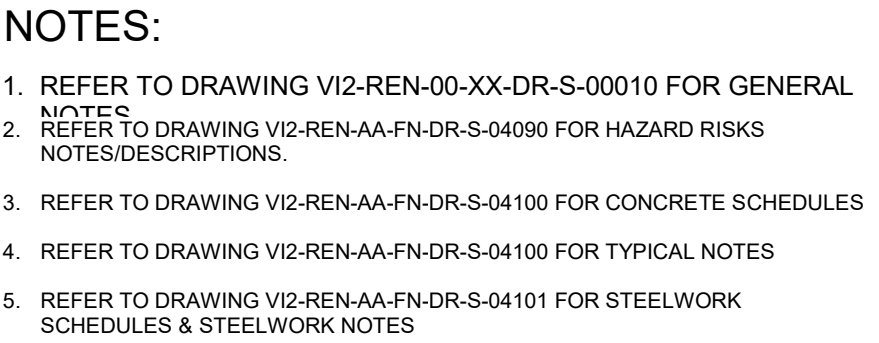
Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	19.10.21	NC	RW	KG

Scale:	1 : 50	Project No:	2102-09
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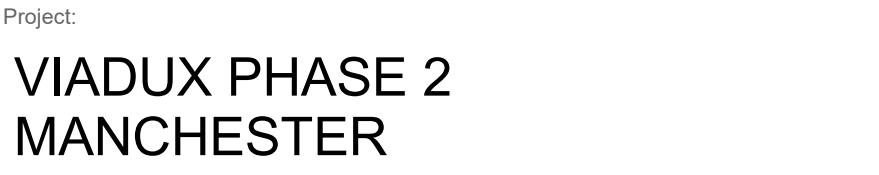
Project Code:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
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V12 - REN - AA - ZZ - DR - S - 04200 - P03

Model: NameXXXXXXXX-REN-ZZ-XX-IM3-S-00001



P03	UPDATED TO SUIT REVISED STRATEGY	10/12/21	AM	PC
P02	STAGE 3 UPDATE	30/11/21	AM	PC
P01	STAGE 3 ISSUE	29/10/21	RW	KG



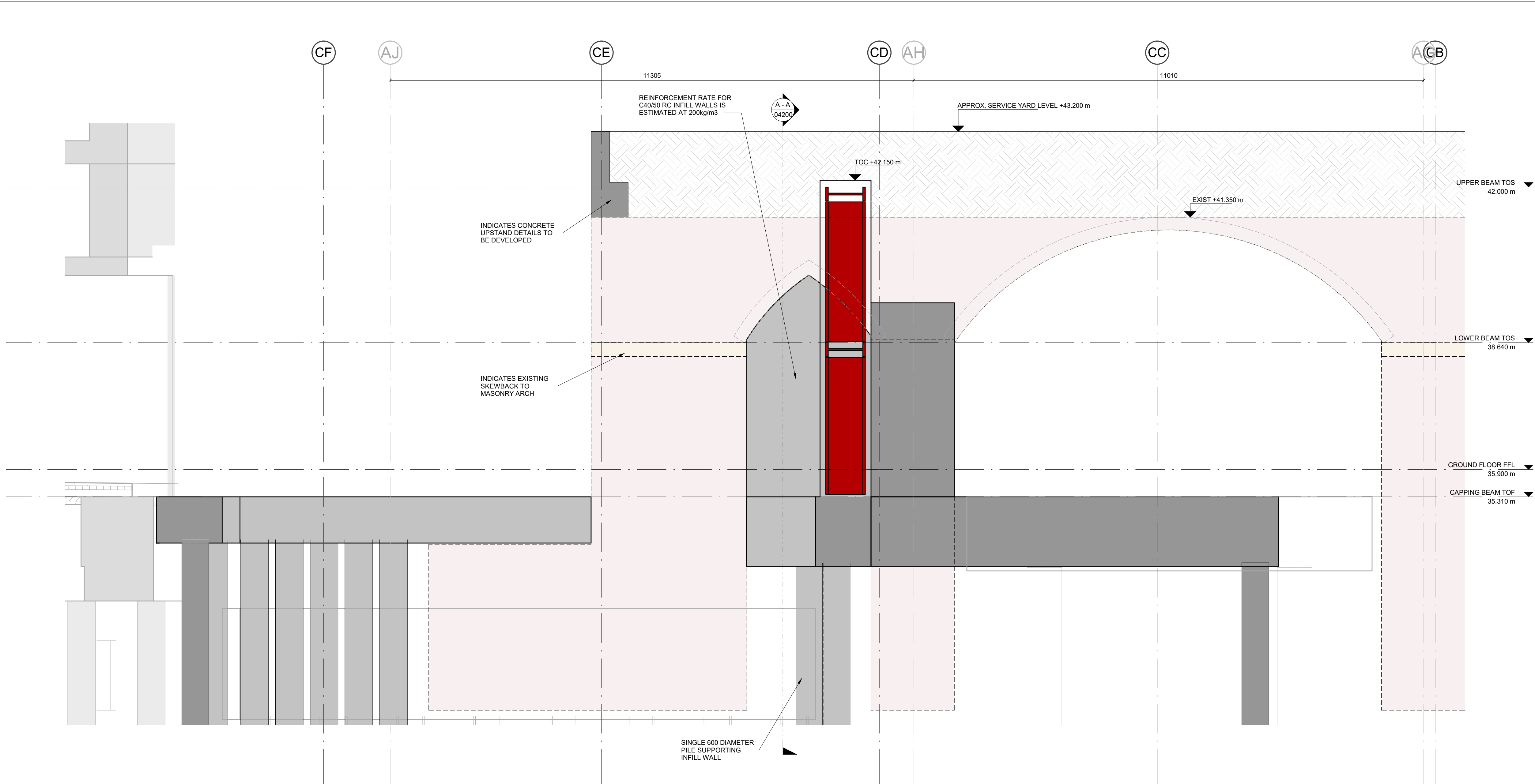
Status:

RIBA STAGE 3

Project Code: Originator: Volume: Level: Type: Role: Category / Number: Rev:

VI2 - REN - AA - ZZ - DR - S - 04201 - P03

VI2 - REN - AA - ZZ - DR - S - 04201 - P03



- NOTES:
- REFER TO DRAWING V12-REN-00-XX-DR-S-00010 FOR GENERAL NOTES
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04090 FOR HAZARD RISKS NOTES/DESCRIPTIONS.
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR CONCRETE SCHEDULES
 - REFER TO DRAWING V12-REN-AA-FN-DR-S-04100 FOR TYPICAL NOTES
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RIBA STAGE 3
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P03	UPDATED TO SUIT REVISED STRATEGY	10/12/21	AM	PC
P02	STAGE 3 UPDATE	30/11/21	AM	PC
P01	STAGE 3 ISSUE	29/10/21	RW	KG

Rev:	Description:	Date:	By:	Chkd:
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Project:
**VIADUX PHASE 2
MANCHESTER**

Drawing Title:
**ABUTMENT REMOVAL WORKS
ELEVATION C-C**

Status:
RIBA STAGE 3

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	19.10.21	NC	RW	KG

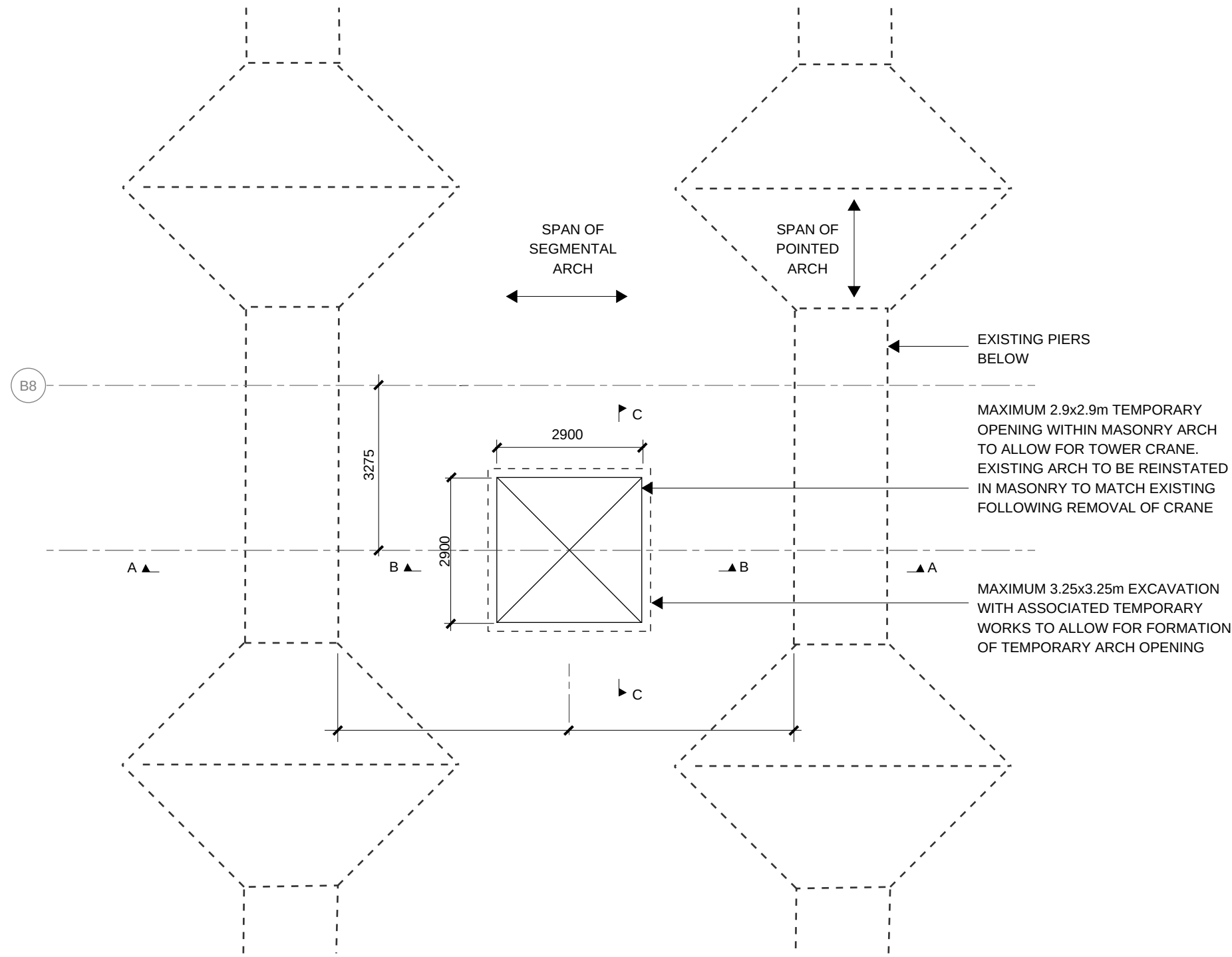
Scale:	1 : 50	Project No:	2102-09
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Project Code:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
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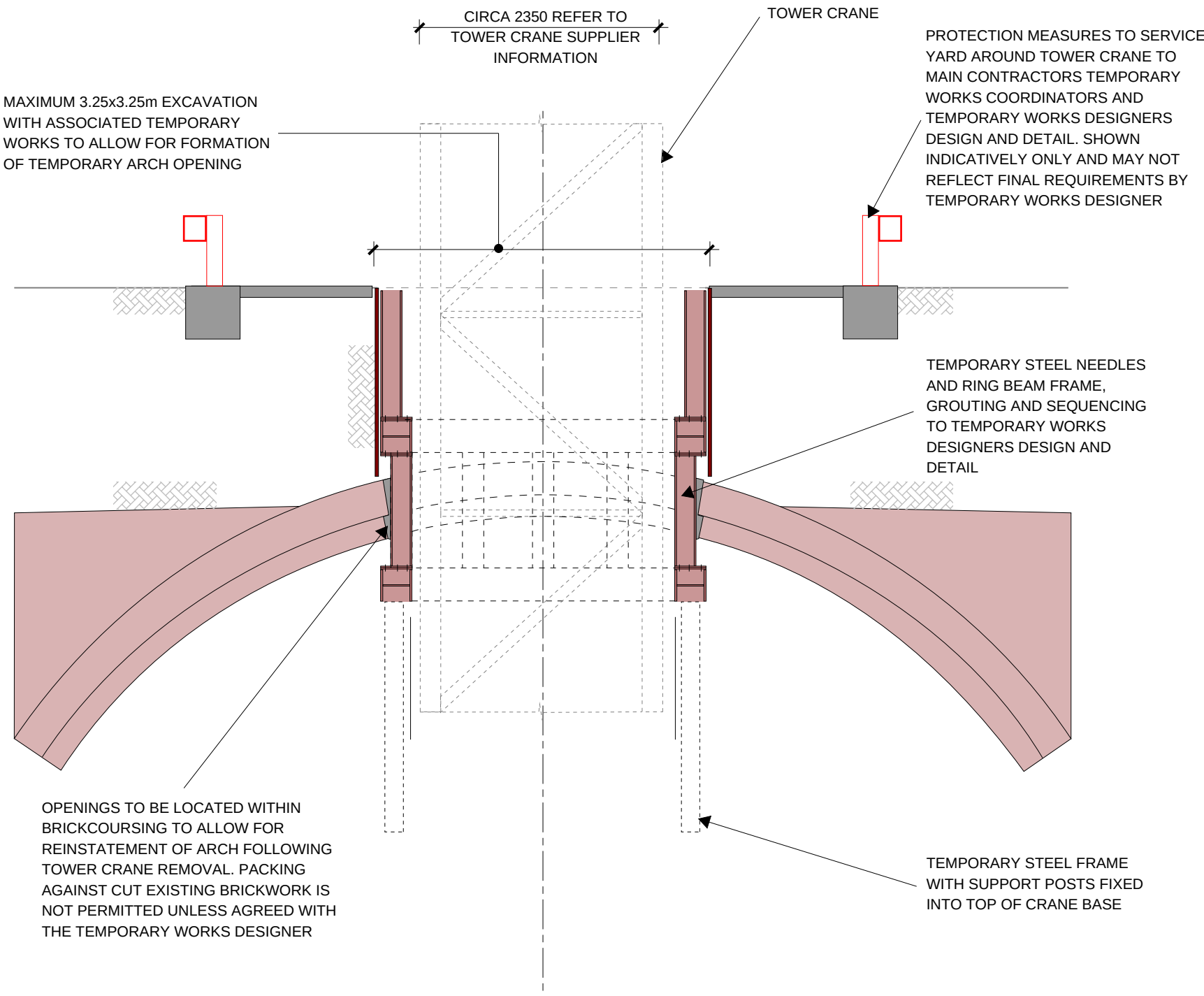
V12 - REN - AA - ZZ - DR - S - 04202 - P03

Model: NameXXXXXX-REN-ZZ-XX-IM3-S-00001

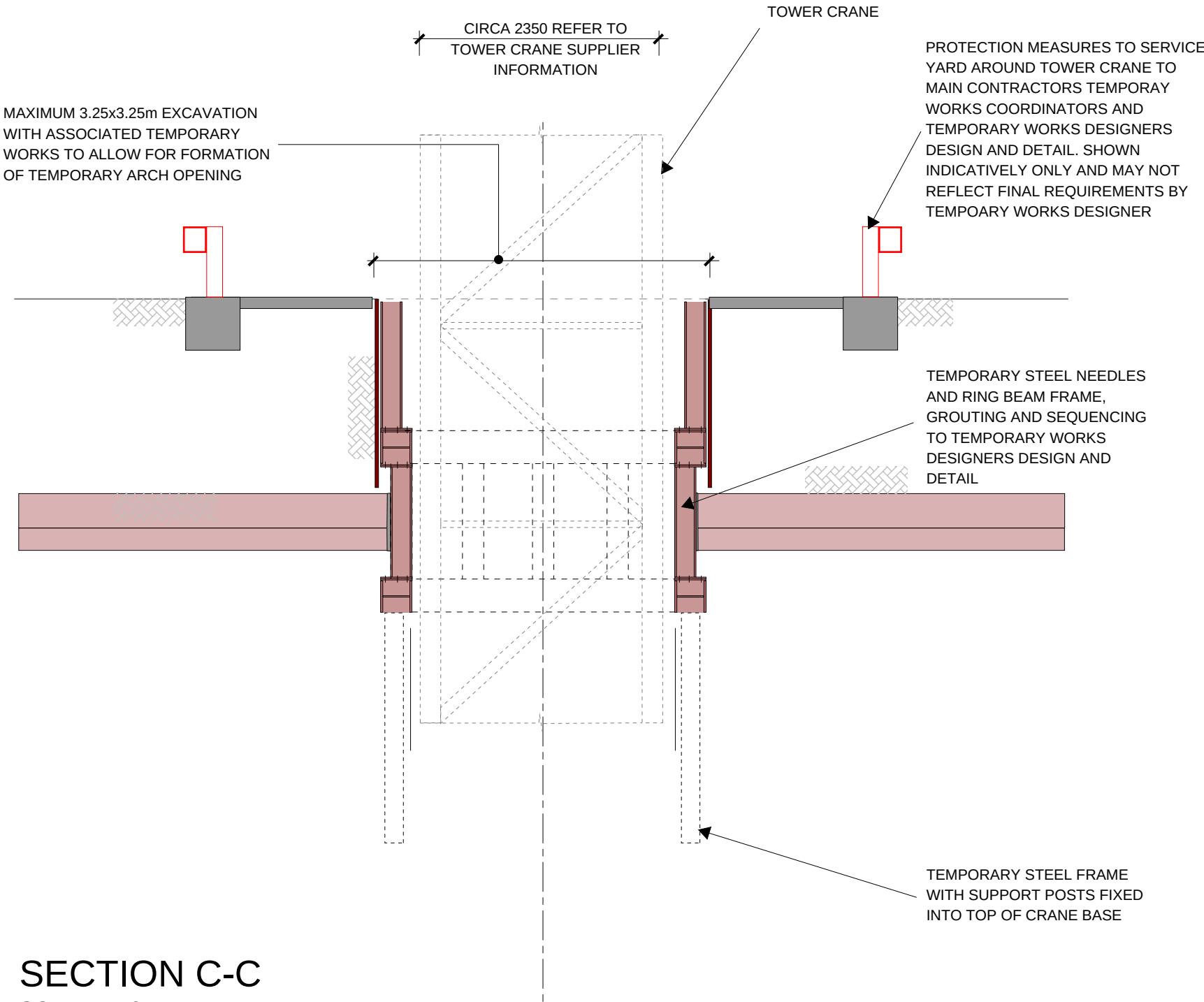
APPENDIX F
TEMPORARY TOWER CRANE OPENING
DRAWINGS



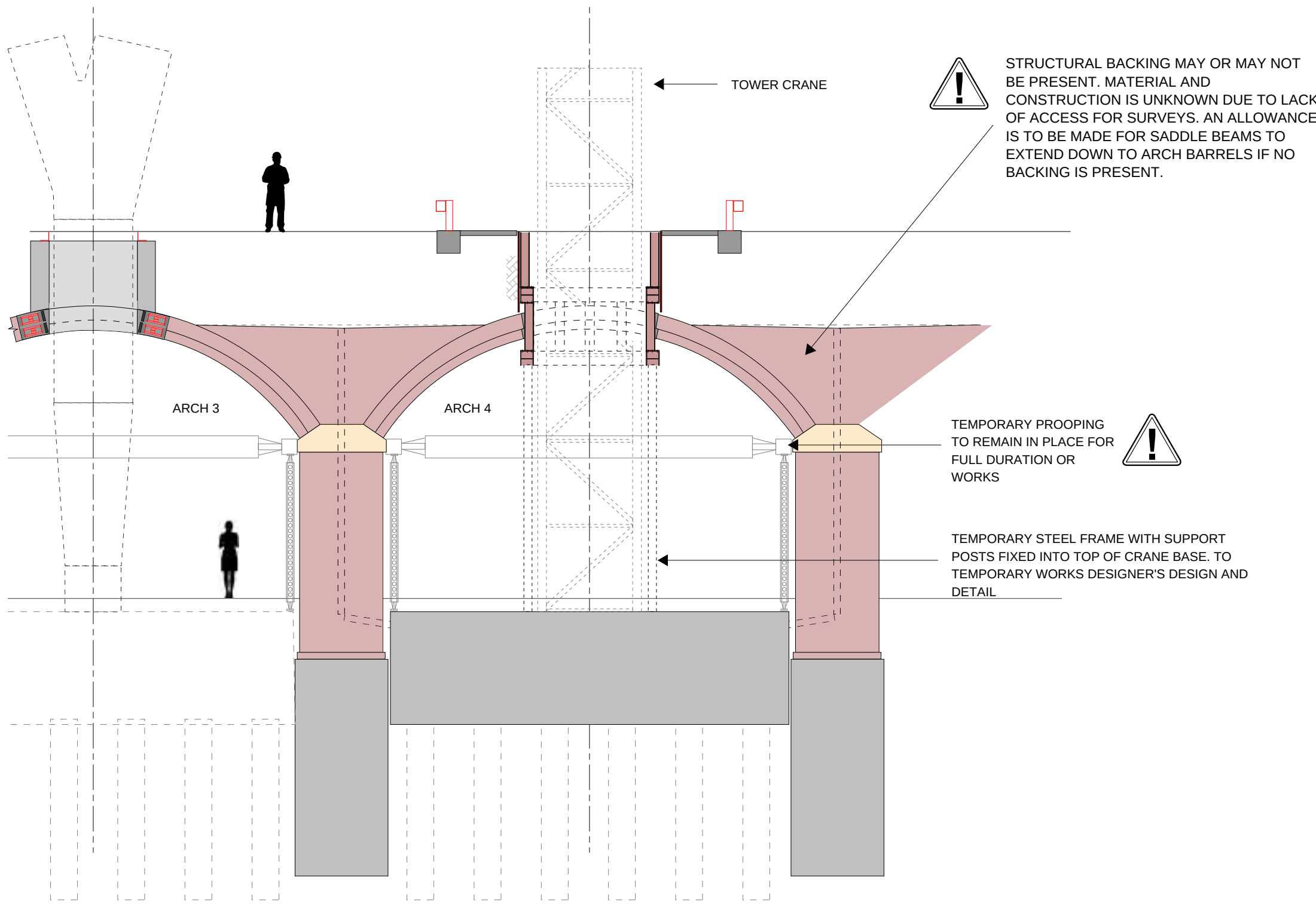
PART PLAN
SCALE 1:100



SECTION B-B
SCALE 1:50



SECTION C-C
SCALE 1:50



SECTION A-A
SCALE 1:100

PERFORMANCE SPECIFICATION - LOADINGS

DESIGN LOADS FROM ARCH
REFER TO DRAWING VIA-REN-0-ZZ-DR-S-90041 FOR DESIGN FORCES WITHIN THE ARCHES

VEHICULAR IMPACT LOAD:
THE SERVICE YARD (LEVEL 01) AND THE UNDERCROFT (GROUND LEVEL) ARE BOTH USED BY VEHICLES, INCLUDING PLANT. THE SERVICE YARD IS REGULARLY USED BY HGVs UP TO 44 TONNE. ACCIDENTAL VEHICULAR IMPACT LOADS SHOULD BE CALCULATED ACCORDINGLY, AND IN ACCORDANCE WITH BS 5975. PROTECTION MEASURES TO THE CRANE AND TEMPORARY WORKS STEELWORK SHOULD BE DESIGNED BY THE TEMPORARY WORKS DESIGNER AND INSTALLED TO THEIR SPECIFICATIONS

PERFORMANCE SPECIFICATION - DEFLECTION OF TEMPORARY WORKS

THE SEQUENCING AND DESIGN OF ALL TEMPORARY WORKS IS TO BE DESIGNED BY THE TEMPORARY WORKS DESIGNER TO LIMIT COMPOUND DEFLECTIONS. TO MINIMISE THE RISK OF DAMAGE AND SIGNIFICANT ALTERATION TO STRESSES WITHIN THE EXISTING GRADE II LISTED VIADUCT ARCHES A TOTAL DEFLECTION LIMITS OF 5mm IS TO BE ADOPTED FROM INSTALLATION OF TEMPORARY WORKS TO FULL LOAD TRANSFER. WHERE THIS IS NOT PRACTICAL, THE TEMPORARY WORKS DESIGNER IS TO DETERMINE WHAT IS ACHIEVABLE AND DISCUSS PROPOSALS WITH RENAISSANCE SO THAT IMPACT ON THE PERMANENT WORKS CAN BE ASSESSED.

PERFORMANCE SPECIFICATION - MOVEMENTS

REFER TO RENAISSANCE VIBRATION AND MOVEMENT MONITORING SPECIFICATION VIA-REN-0-XX-SP-S-00060. ALL HORIZONTAL PROPPING IS TO INCLUDE LOAD CELLS WHICH ARE TO BE MONITORED WITH MOVEMENT TO ENSURE LOAD TRANSFER IS AS EXPECTED AND MOVEMENTS ARE WITHIN ACCEPTABLE LIMITS. WHERE MOVEMENT OR LOAD LIMITS ARE EXCEEDED THE TEMPORARY WORKS CO-ORDINATOR IS TO NOTIFY THE TEMPORARY WORKS DESIGNER IMMEDIATELY.

PERFORMANCE SPECIFICATION - VIBRATIONS

TO PREVENT DEBONDING OF THE BRICKWORK AND ARCH RINGS ALL BREAKING OUT WORKS ARE TO BE UNDERTAKEN USING NON-PERCUSSIVE TECHNIQUES.

PERFORMANCE SPECIFICATION - MATERIAL

THE ARCH TO THE TOWER CRANE OPENING IS TO BE REINSTATED FOLLOWING REMOVAL OF THE TOWER CRANE. ALLOW FOR CAREFULLY REMOVING AND CLEANING OF BRICKWORK AND STORING FOR REUSE TO REINSTATE THE ARCH.

NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE PRINCIPAL CONTRACTORS TEMPORARY WORKS BRIEF AND ASSOCIATED DOCUMENTATION.
- THIS DRAWING PROVIDES AN OUTLINE CONSTRUCTION METHODOLOGY TO FORM THE PERMANENT FOUNDATION WORKS. THE PRINCIPAL CONTRACTOR, RELEVANT SUB-CONTRACTORS AND ASSOCIATED TEMPORARY WORKS DESIGNERS, ARE TO REVIEW THE OUTLINE CONSTRUCTION METHODOLOGY AND SATISFY THEMSELVES THAT THE WORKS ARE BUILDABLE AND CAN BE UNDERTAKEN IN A SAFE MANNER, PRIOR TO COMMENCING THE WORK. THE SUB-CONTRACTORS AND TEMPORARY WORKS DESIGNER ARE TO NOTIFY THE PRINCIPAL CONTRACTORS TEMPORARY WORKS CO-ORDINATOR IF AMENDMENTS ARE REQUIRED TO SUIT SITE CONSTRAINTS OR INSTALLATION. APPROVAL IS REQUIRED PRIOR TO INCORPORATION INTO THEIR DESIGN AND INSTALLATION WORKS.
- THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION AND MONITORING OF THE TEMPORARY WORKS AND UNDERTAKING THEIR OWN INSPECTIONS. ALL WORKS ARE ALSO TO BE REVIEWED, MANAGED AND INSPECTED BY THE PRINCIPALS CONTRACTORS TEMPORARY WORKS CO-ORDINATOR. THE INSPECTION REGIME IS TO BE IN ACCORDANCE WITH THE PRINCIPAL CONTRACTORS TEMPORARY WORKS CO-ORDINATORS REQUIREMENTS.
- THE PRINCIPAL CONTRACTORS TEMPORARY WORKS CO-ORDINATOR IS TO SATISFY THEMSELVES THAT CONTRACTORS UNDERTAKING THE WORKS AND TEMPORARY WORKS DESIGNERS ARE SUITABLY QUALIFIED AND EXPERIENCED IN UNDERTAKING WORKS OF THE NATURE SHOWN.
- ALL TEMPORARY WORKS (AND THEIR MANAGEMENT) ARE TO BE IN ACCORDANCE WITH THE LATEST EDITION OF BS5975.
- THE CATEGORY OF CHECKING FOR EACH TEMPORARY WORKS ITEMS IS TO BE AGREED BETWEEN THE PRINCIPAL CONTRACTORS TEMPORARY WORKS CO-ORDINATOR AND TEMPORARY WORKS DESIGNER PRIOR TO UNDERTAKING THE DESIGN.
- THE LOADS PROVIDED ON THE OUTLINE CONSTRUCTION METHODOLOGY DRAWING ARE APPROXIMATE ONLY AND FOR OUTLINE COSTING PURPOSES ONLY. DETAILED LOADINGS ARE TO BE DERIVED BY THE TEMPORARY WORKS DESIGNER AS PART OF THEIR TECHNICAL DESIGN FOR THE TEMPORARY WORKS ITEMS. WHERE LOADINGS ARE PROVIDED BY RENAISSANCE THIS IS SUBJECT TO AN EXTENSION IN SCOPE OF SERVICE. THE TEMPORARY WORKS DESIGN RESPONSIBILITY FOR ALL OTHER TEMPORARY WORKS ITEMS REMAINS WITH THE TEMPORARY WORKS DESIGNER.
- REFER TO DRAWING VIA-REN-A-ZZ-DR-S-02100 FOR THE VIADUCT PENETRATION PLAN.
- REFER TO SURVEY SYSTEMS TOPOGRAPHICAL AND UTILITY SURVEY (2016) AND RENAISSANCE BELOW GROUND DRAINAGE LEVEL 01 PLAN VIA-REN-0-00-DR-C-01101 AND 01102.
- REFER TO CML'S VIADUCT INTRUSIVE WORKS AND MATERIAL TESTING REPORT, 2020, FOR INFORMATION REGARDING MATERIAL PROPERTIES AND EXISTING CONSTRUCTION.
- THIS DRAWING IS INDICATIVE ONLY. DETAILS TO BE DEVELOPED BY TEMPORARY WORKS ENGINEER.
- TEMPORARY WORKS DESIGNER TO SPECIFY FURTHER INTRUSIVE WORKS AS REQUIRED TO SUIT TOWER CRANE OPENING DESIGN.
- REFER TO TOWER CRANE INFORMATION FOR FULL DIMENSIONS.

HEALTH AND SAFETY NOTES:

IN ADDITION TO THE HAZARDS AND RISKS NORMALLY ASSOCIATED WITH WORKS OF THIS NATURE, NOTE THE FOLLOWING:

- RISK OF ACCIDENTAL VEHICLE IMPACT TO CRANE. PROTECTION TO CRANE TO BE INSTALLED TO TEMPORARY WORKS ENGINEER'S DESIGN.
- RISK OF CRANE STRIKING MASONRY ARCH OR TEMPORARY STEELWORK DURING INSTALLATION. RISK OF DAMAGE OR PARTIAL COLLAPSE TO VIADUCT. THIS HAS BEEN PARTIALLY MITIGATED THROUGH THE TEMPORARY PROPS INSTALLED AT SPRINGER LEVEL.
- RISK OF CRANE MOVEMENTS IMPARTING FORCES INTO MASONRY VIADUCT. OPENING TO BE OF SUFFICIENT SIZE TO ENSURE CRANE DOES NOT CONTACT MASONRY VIADUCT.
- LACK OF ACCESS FOR SURVEYS MEANS THAT THE EXISTING VIADUCT CONSTRUCTION IS ESTIMATED STRUCTURAL BACKING MAY OR MAY NOT BE PRESENT BEHIND THE ARCH BARRELS. AN ALLOWANCE IS TO BE MADE FOR INSPECTION OF THE STRUCTURE ONCE EXPOSED.
- REMOVAL OF FILL BEYOND MAXIMUM ZONE INDICATED COULD RESULT IN DESTABILISING OF THE ARCHES. ALL TEMPORARY WORKS INSTALLATION AND REMOVAL SEQUENCES AND METHODS OF WORKING TO BE DEVELOPED BY THE TEMPORARY WORKS DESIGNER TO ENSURE OVER EXCAVATION IS AVOIDED.

T01	STAGE 4 ISSUE	20.04.21	GR	KG
P01	STAGE 3 ISSUE	04.12.20	RW	PC
Rev:	Description:	Date:	By:	Chkd:



Project:
**VIADUX
MANCHESTER**

Drawing Title:
**TOWER CRANE OPENING -
INDICATIVE METHODOLOGY**

Status:
RIBA STAGE 4

Size:	A1	Date:	04.12.20	Drawn by:	GR	Designed by:	-	Checked by:	KG
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Scale: AS SHOWN		Project No: 1910-12					
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:

VIA-REN-0-ZZ-DR-S-90040-T01

y,1
x,2

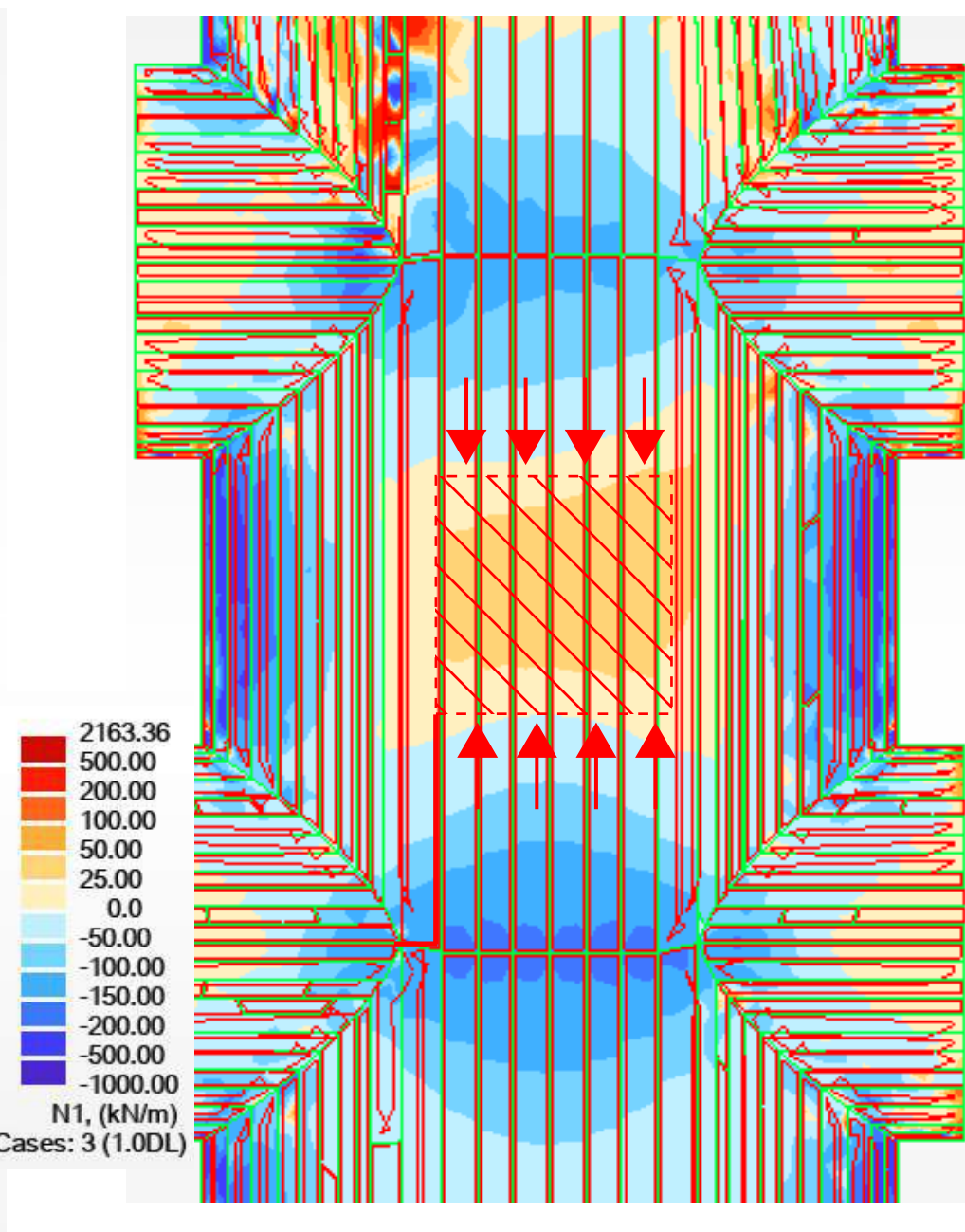
DETAIL P001
PENETRATION LOCATIONS
1:200

INDICATES APPROXIMATE
EXTENT OF PROPOSED
TEMPORARY CRANE
OPENING



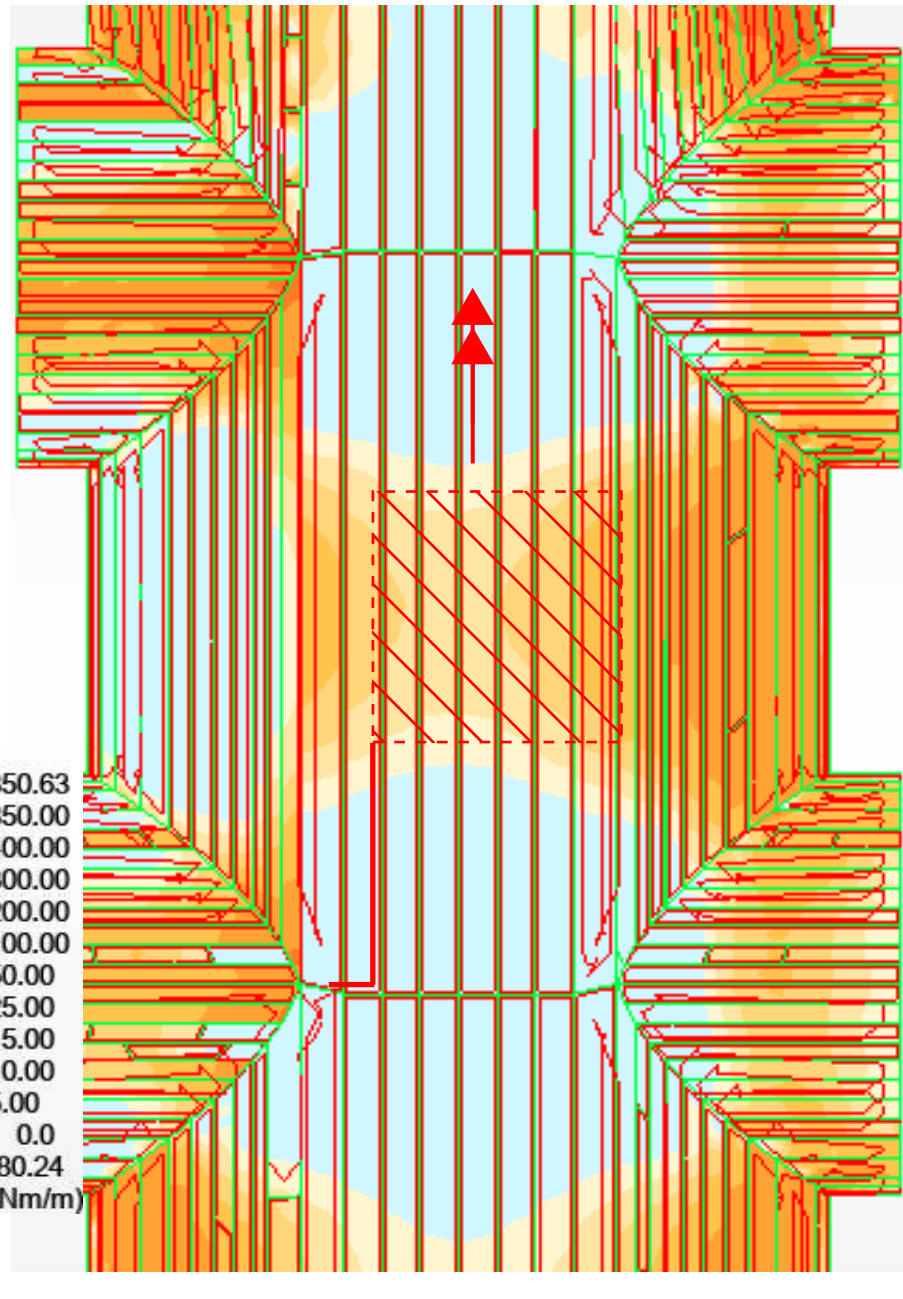
IN PLANE AXIAL FORCE, $N_{2,Ed}$
(MEMBRANE FORCE 2):

Dead Load $N_{Gk} = 300\text{kN/m}$
Imposed $N_{Qk} = 100\text{kN/m}$



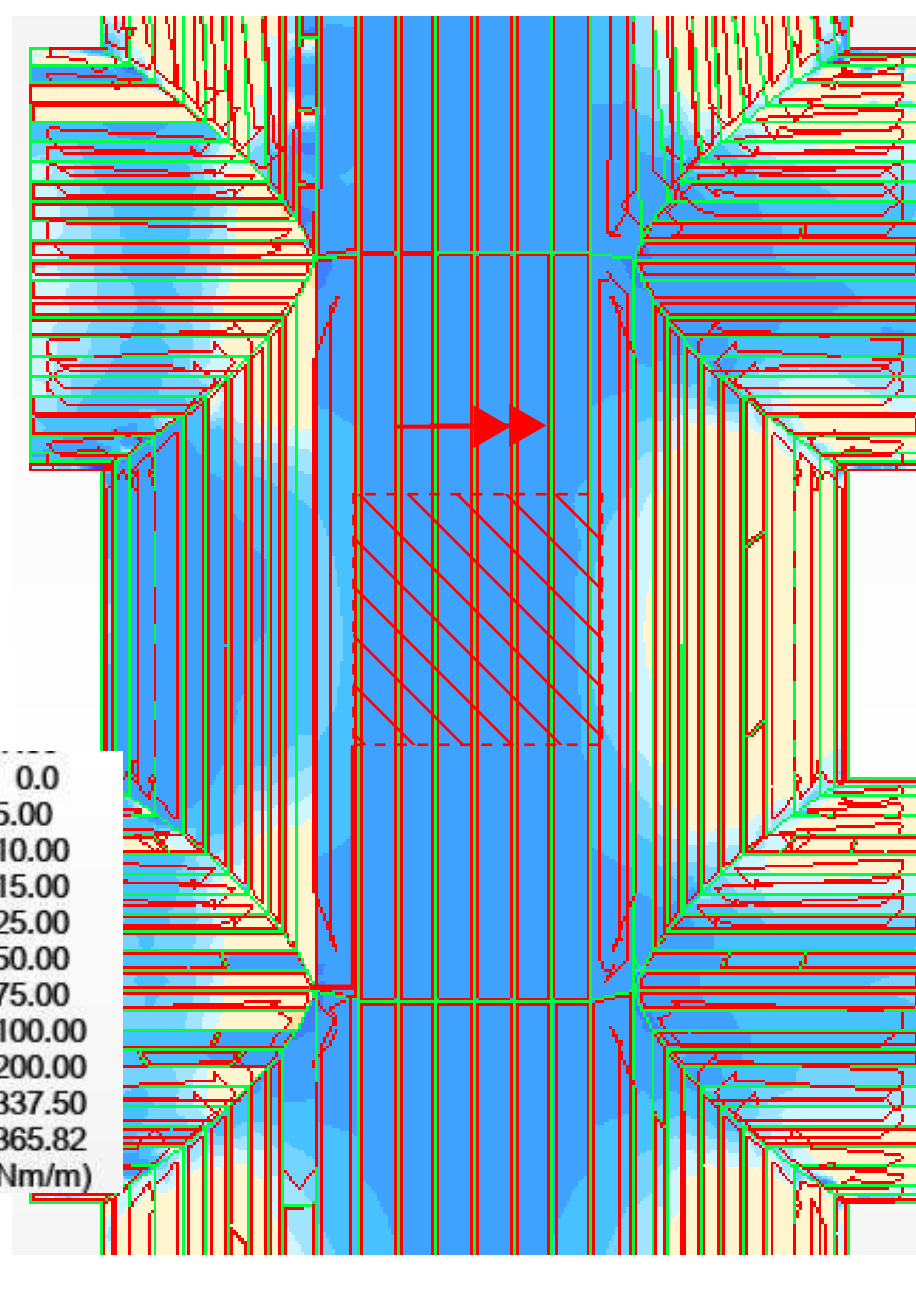
IN PLANE AXIAL FORCE, $N_{1,Ed}$
(MEMBRANE FORCE 1):

Dead Load $N_{Gk} = 50\text{kN/m}$
Imposed $N_{Qk} = 20\text{kN/m}$



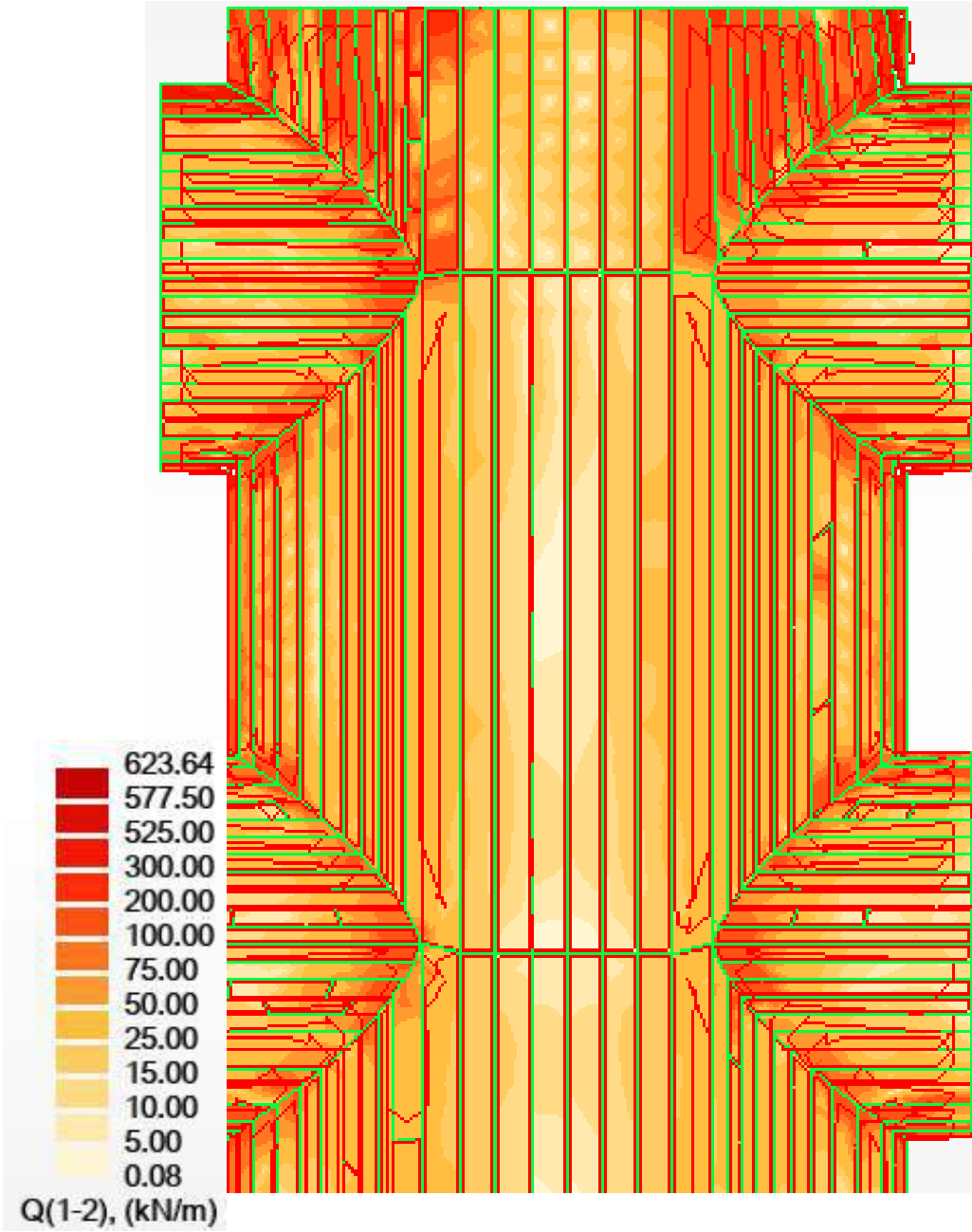
IN PLANE MOMENTS, $M_{1,Ed}$

Dead Load $M_{Gk} = +/- 15\text{kNm/m}$
Imposed $M_{Qk} = +/- 20\text{kNm/m}$



IN PLANE MOMENTS, $M_{2,Ed}$

Dead Load $M_{Gk} = +/- 25\text{kNm/m}$
Imposed $M_{Qk} = +/- 15\text{kNm/m}$

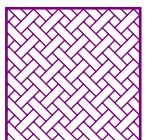


SHEAR, V_{Ed}

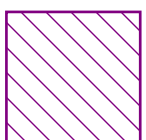
Dead Load $V_{Gk} = +/- 30\text{kNm/m}$
Imposed $V_{Qk} = +/- 10\text{kNm/m}$

TEMPORARY LOAD RESTRICTION TO SERVICE YARD
ADJACENT TO WORKS

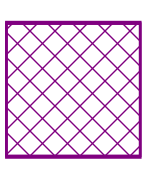
TO PREVENT OVERSTRESSING OF THE ARCH IN THE TEMPORARY CASE
THE FOLLOWING LOAD RESTRICTIONS ARE TO BE IMPLEMENTED AND
MANAGED BY THE MAIN CONTRACTOR, SUB-CONTRACTOR AND
TEMPORARY WORKS CO-ORDINATOR:



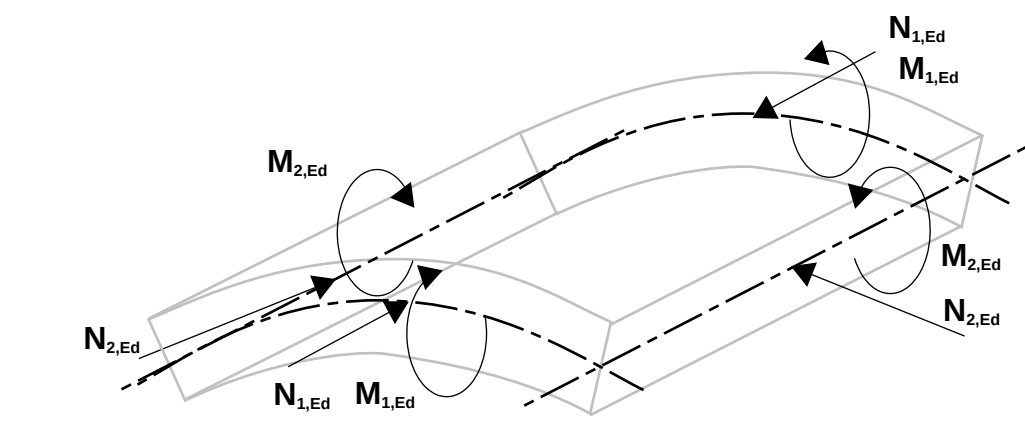
DURING EXCAVATION, INSTALLATION, INFILLING
AND REMOVAL OF STEEL FRAME NO VEHICULAR
ACCESS PERMITTED



DURING EXCAVATION, INSTALLATION, INFILLING
AND REMOVAL OF STEEL FRAME NO VEHICULAR
ACCESS EXCEEDING 7.5 TONNE PERMITTED. ZONE
NOT REQUIRED DURING NORMAL OPERATION ONCE
TEMPORARY WORKS INSTALLED



IN NORMAL OPERATION WITH TEMPORARY WORKS IN
PLACE NO VEHICLE EXCEEDING 7.5 TONNE PERMITTED
WITHIN ZONE



DESIGN FORCE
SIGN CONVENTION

NOTE: AXIAL FORCE LOCATION CAN OCCUR
ANYWHERE WITHIN THE DEPTH OF THE MASONRY
ARCH SECTION AS THE THRUST LINE ALTERS TO SUIT
THE APPLIED LOADING SCENARIOS. THEREFORE ALL
TEMPORARY WORKS DESIGN TO BE BASED UPON
THE WORSE CASE LOCATION OF AXIAL LOADING
WITHIN THE DEPTH OF THE MASONRY ARCH

HEALTH AND SAFETY NOTES:

IN ADDITION TO THE HAZARDS AND RISKS NORMALLY ASSOCIATED
WITH WORKS OF THIS NATURE, NOTE THE FOLLOWING:



LACK OF ACCESS FOR SURVEYS MEANS THAT THE
EXISTING VIADUCT CONSTRUCTION IS ESTIMATED.
STRUCTURAL BACKING MAY OR MAY NOT BE PRESENT
BEHIND THE ARCH BARRELS. LOADINGS ARE TO BE
REVIEWED AND MAY CHANGE FOLLOWING THE FINDINGS
OF THE SITE INVESTIGATION



TO AVOID OVERSTRESSING OF ARCH AND POTENTIAL
ARCH INSTABILITIES IN THE TEMPORARY CASE LOAD
RESTRICTION ZONES ARE REQUIRED AS INDICATED. THESE
ARE TO BE CONTROLLED BY THE MAIN CONTRACTOR AND
SUB-CONTRACTOR UNDERTAKING THE WORKS.



REMOVAL OF FILL BEYOND MAXIMUM ZONE INDICATED ON
VIA-REN-0-ZZ-DR-S-90040 COULD RESULT IN DESTABILISING
OF THE ARCHES. ALL TEMPORARY WORKS INSTALLATION
AND REMOVAL SEQUENCES AND METHODS OF WORKING
TO BE DEVELOPED BY THE TEMPORARY WORKS DESIGNER
TO ENSURE OVER EXCAVATION IS AVOIDED.

GENERAL NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
VIA-REN-0-ZZ-DR-S-90040.

SUPPORTING INFORMATION

TEMPORARY WORKS DESIGNER TO REFER TO THE FOLLOWING
INFORMATION WHICH IS AVAILABLE FROM THE MAIN CONTRACTOR

- EXISTING BUILDING SURVEY INFORMATION
- SI REPORT AND TRIAL HOLES INFORMATION
- STRUCTURAL SURVEY REPORT
- VIA-REN-0-ZZ-DR-S-90040 TOWER CRANE OPENING - INDICATIVE METHODOLOGY

PERFORMANCE SPECIFICATION - DESIGN FORCES

THE DESIGN FORCES PRESENTED ON THIS DRAWING ARE TO
FACILITATE THE TEMPORARY WORKS DESIGNER IN DESIGNING
AND DEVELOPING THE TEMPORARY WORKS DESIGN
ASSOCIATED WITH THE TOWER CRANE OPENING.

DESIGN REQUIREMENTS

THE DESIGN STRATEGY IT TO MINIMISE THE IMPACT ON THE
ARCHES FROM THE TEMPORARY CRANE OPENING. THE
TEMPORARY WORKS ARE TO BE DESIGNED TO MINIMISE
MOVEMENT SO THAT EXISTING LOAD PATHS AND STRESS
LEVELS ARE MAINTAINED AND THE RISK OF LOAD
REDISTRIBUTION AND DAMAGE TO THE MASONRY GRADE II
LISTED ARCHES IS MINIMISED.

ASSUMPTIONS

THE ARCH FORCES PROVIDED ARE BASED ON THE FOLLOWING
ASSUMPTIONS WHICH ARE TO BE REVIEWED FOLLOWING THE
SITE INVESTIGATION WORKS.

- SELFWEIGHT
- SURFACE: 50mm TARMAC, DENSITY 20kN/m³
- FILL: DENSITY 19.5kN/m³
- BRICKWORK: DENSITY 18.5kN/m³

IF THE MATERIALS AND DENSITIES ENCOUNTERED DIFFER
FROM THE ABOVE ASSUMPTIONS RENAISSANCE SHOULD BE
ADVISED AS THESE MAY ALTER THE LOADINGS.

THE IMPOSED LOAD FROM HGV IS ASSUMED TO BE 20kN/m².

DESIGN FORCES

THE FORCES PROVIDED ARE UNFACTORED (SLS) AND THE
TEMPORARY WORKS DESIGNED SHOULD FACTOR FOR
ULTIMATE LIMIT STATE TO SUIT THE DESIGN CODES ADOPTED.

THE MOST ONEROUS COMBINATION OF DESIGN FORCES IS TO
BE TAKEN IN THE DESIGN OF ANY TEMPORARY WORKS. THE
PRINCIPAL AXIAL AND BENDING MOMENT FORCES IN DIRECTION
2 ARE TO BE CONSIDERED WITH AND WITHOUT THE FORCES IN
DIRECTION 1 TO OBTAIN THE MOST ONEROUS LOADINGS FOR
DESIGN PURPOSES. NOTE ALL FORCES ARE IN THE PLANE OF
THE ARCH AND THE TEMPORARY WORKS DESIGNER SHOULD
DECOMPOSE THE FORCES IF REQUIRED FOR THE DESIGN OF
THEIR ELEMENTS.

ALL OTHER TEMPORARY LOADS ASSOCIATED WITH THE WORKS
ARE TO BE DETERMINED BY THE TEMPORARY WORKS
DESIGNER AND INCORPORATED INTO THE TEMPORARY WORKS
DESIGN.

FACTORS OF SAFETY

THE DESIGN FORCES AND LOADINGS ARE APPROXIMATE AND
BASED ON DETAILED REVIEW OF BOTH 2D AND 3D MODELS. ALL
DESIGN LOADS GIVEN ON THIS DRAWING SHOULD BE
INCREASED BY A MINIMUM 10% TO ALLOW FOR MODELLING
ACCURACIES. THIS IS IN ADDITIONAL TO THE NORMAL LOAD
FACTORS USED WITHIN THE TEMPORARY WORKS DESIGN.

HORIZONTAL TEMPORARY PROPPING

THE DESIGN LOADINGS GIVEN ARE BASED UPON THE
TEMPORARY HORIZONTAL PROPPING AT SKEWBACK LEVEL
BEING INSTALLED PRIOR TO REMOVAL OF THE FILL TO THE
ARCHES AND FORMATION OF THE TEMPORARY CRANE OPENING.
THE HORIZONTAL PROPPING IS TO REMAIN IN PLACE FOR THE
DURATION OF THE WORKS AND NOT REMOVED UNTIL THE
EXISTING ARCH HAS BEEN REINSTATED AND BACKFILLED. THE
TEMPORARY WORKS DESIGNER IS TO ENSURE THAT PROPPING
IS DESIGNED AND PROTECTED TO PREVENT ACCIDENTAL
REMOVAL. TEMPORARY WORKS DESIGNER TO AGREE
INSPECTION AND MAINTENANCE REQUIREMENTS FOR THE
DURATION.

T01	STAGE 4 ISSUE	20.04.21	GR	KG					
Rev.	Description:	Date:	By:	Chkd:					
		Renaissance Associates Carvers Warehouse 77 Dale Street Manchester M1 2HG							
Project: VIADUX MANCHESTER									
Drawing Title: TOWER CRANE OPENING - DESIGN FORCES									
Status: RIBA STAGE 4									
Size:	A1	Date:	19.04.20	Drawn by:	GR	Designed by:	-	Checked by:	KG
Scale:	NTS		Project No:	1910-12					
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:		
VIA-REN-0-ZZ-DR-S-90041-T01									