

<b>LBC comment</b>	<b>BB action and mitigation</b>
<p><b>Balustrade</b></p> <p>That no works to remove the balustrade around the Gardens at street level shall take place unless a detailed methodology carried out by a qualified specialist for its removal, repair, storage, strengthening and reinstatement have been submitted to and approved in writing by the planning authority. Thereafter no works shall be carried out unless in complete accordance with such details as so approved unless otherwise agreed in writing with the planning authority.</p> <p>- to safeguard the special architectural and historical character of the site.</p>	<ul style="list-style-type: none"> <li>• Before works can start a detailed record of the existing balustrade will be done by BB to high light any existing damages and positions of individual items within the balustrade (see appendix 1).</li> <li>• Methodology of removal:             <ol style="list-style-type: none"> <li>1.0 the granite coping stone will be lifted from its existing position using slings and excavator, wooden wedges may be used to part the column from the coping stone, in some cases a chasing cut will be done using hammer and chisel. The coping stone will then be given its unique identification number and placed on pallet for easy handling.                 <ol style="list-style-type: none"> <li>1.1 Columns will be choke lifted using slings and wooden wedges driven between the columns and seating stone to part the column from the iron seating dowels. Once free the columns will be given a unique identification number and stored on pallets.</li> <li>1.2 The seating stone will be freed from the arches using a 100mm chasing cut in the mortar bed using 100mm blade grinder. The stone will then be lifted out by hand and placed on a pallet and given a unique identification number.</li> </ol> </li> <li>2.0 The cleaning of the dissembled balustrade will be done using a high-pressure steam cleaning lance.                 <ol style="list-style-type: none"> <li>2.1 any damage on the individual item will then be assessed and best course of repairing decided.</li> <li>2.2 At this point with the balustrade disassembles and cleaned the stones will now be drilled to receive the new stainless steel doweling pins, this will be done using a specialised core drill on a lathe (see appendix 2 for details).</li> </ol> </li> <li>3.0 The reassembly of the balustrade will be done in the reverse methodology of 1.0-1.2 however the new additional stainless-steel guide pins will be installed. The pins will be installed with resin in to the pre cored holes then the three separate items will be mortared on using a lime-based mortar to prevent water ingress to the joint.                 <ol style="list-style-type: none"> <li>3.1 All components of the balustrade will be put back into their original positions where possible, this will be done using the individual items unique identification numbers.</li> </ol> </li> </ol> </li> </ul>

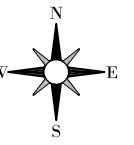
### **Granite Storage**

That no dountaking of any granite features, shall take place until details of the safe storing of said granite have be submitted to and approved in writing by the planning authority. Thereafter no works shall be carried out unless in complete accordance with such details as so approved unless otherwise agreed in writing with the planning authority.

- to safeguard the special architectural and historical character of the site.

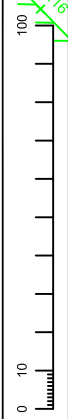
- The down takings of the granite balustrade will be kept on site where possible, however if specialist work or repair of individual items of balustrade need to be done these items will be taken to the granite specialist Graeme Cheyne (<https://www.graemecheynebuilders.co.uk/>)
- Off-site material storage address:  
Graeme W Cheyne builders  
2 Walker Lane  
Toray  
AB11 8BW
- All materials taken off site will be covered under a separate insurance policy to cover damage and theft.
- All materials taken off site will be tracked and traced via the unique identification number.
- All granite down takings that are identified to stay within the site will be placed on pallets, padded with hessian or other soft material and then banded to secure to the pallet. No more than three items of granite per pallet and no pallets will be stacked. A specified area will be given for granite storage that is fenced off from other site activates.

# Appendix 1



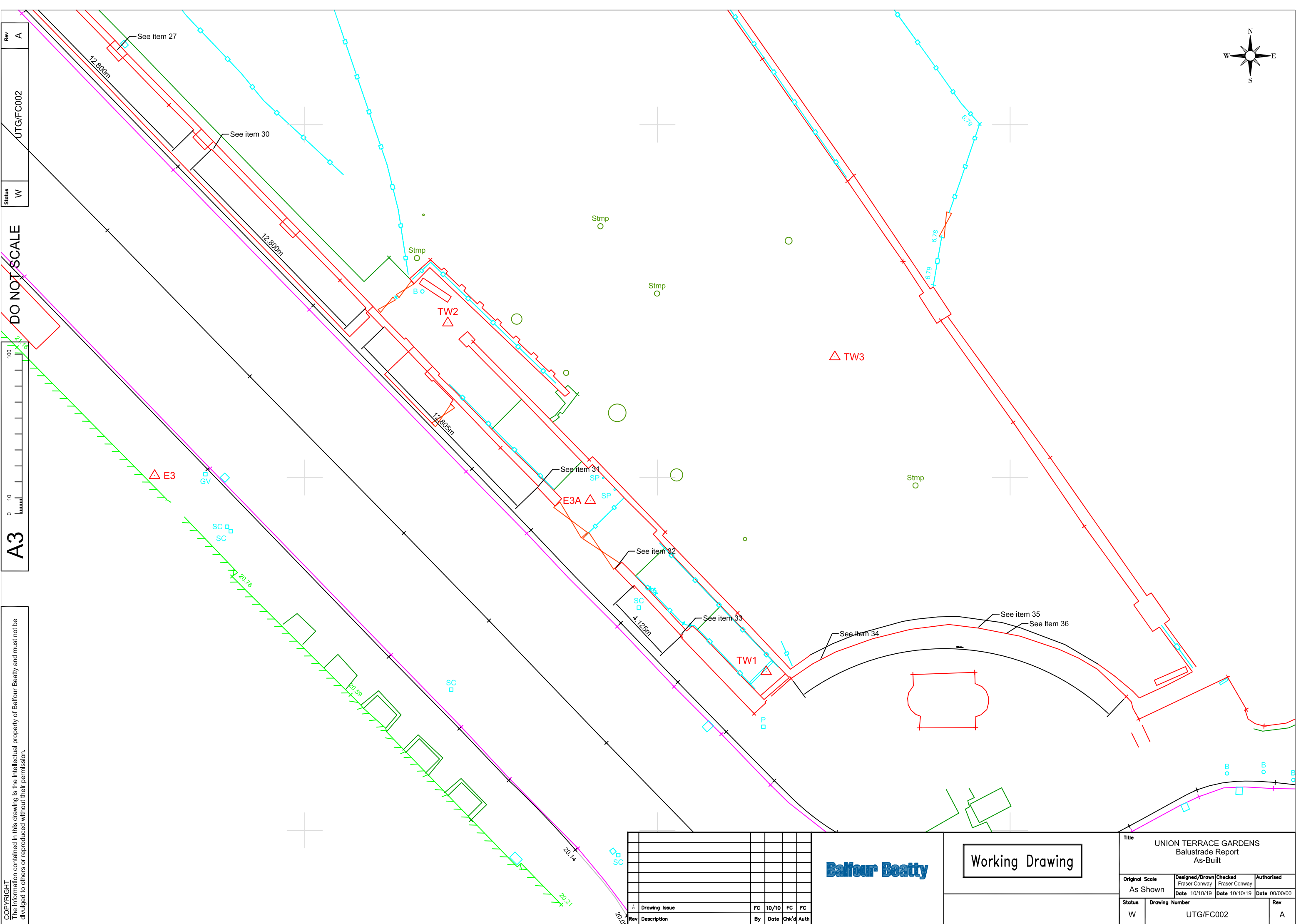
Rev A  
 UTG/FC002  
 Status W

DO NOT SCALE



A3

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Rev	Description	By	Date	Ch'k'd	Auth
A	Drawing Issue	FC	10/10	FC	FC



Working Drawing

Title UNION TERRACE GARDENS Balustrade Report As-Built			
Original Scale As Shown	Designed/Drawn Fraser Conway	Checked Fraser Conway	Authorised
Date 10/10/19	Date 10/10/19	Date 00/00/00	
Status W	Drawing Number UTG/FC002	Rev A	




















Item	Location	Description	Image
1	Section 1 Balustrade 9	Crack in base	 A close-up photograph of a stone balustrade base. The stone is dark grey with some lighter spots. A thin crack is visible in the lower part of the balustrade. A small, light-colored object, possibly a piece of debris or a small hole, is visible on the surface of the stone.
2	Section 3 Balustrade 1	Crack in base	 A close-up photograph of a stone balustrade base. The stone is dark grey with some lighter spots. A thin crack is visible in the lower part of the balustrade. The background shows a metal fence and some greenery.

<p><b>3</b></p>	<p>Section 4 Slab 7</p>	<p>Crack in outer side</p>	 A close-up photograph of a concrete slab. The slab is light-colored with a dark, reddish-brown horizontal band near the bottom. A vertical crack is visible on the right side of the slab. Below the slab, two large, rounded concrete supports are visible.
<p><b>4</b></p>	<p>Section 4 Slab 13</p>	<p>Crack in inner side</p>	 A close-up photograph of a concrete slab. The slab is light-colored with a dark, reddish-brown horizontal band near the bottom. A vertical crack is visible on the right side of the slab. The slab is supported by a metal railing on the left side.



<p>5</p>	<p>Section 5 Balustrade 15</p>	<p>Paint on balustrade</p>	
<p>6</p>	<p>Section 5 Balustrade 22</p>	<p>Crack through bottom neck</p>	

<p><b>7</b></p>	<p>Section 6 Slab 7</p>	<p>Crack in outer side</p>	 A close-up photograph of a concrete slab, likely a balustrade top. A distinct horizontal crack is visible on the outer side of the slab. The concrete has a speckled, greyish texture. In the background, a chain-link fence and green foliage are visible.
<p><b>8</b></p>	<p>Section 6 Balustrade 4</p>	<p>Crack through bottom neck</p>	 A close-up photograph of a concrete balustrade post. The post has a bulbous top section and a narrower neck. A crack is visible running through the bottom neck of the post. The concrete is grey and speckled. A chain-link fence is visible in the background.


<p>9</p>	<p>Section 6 Balustrade 6</p>	<p>Patch up job over crack through bottom neck</p>	
<p>10</p>	<p>Section 6 Balustrade 20</p>	<p>Paint over balustrade</p>	


<p><b>11</b></p>	<p>Section 7</p>	<p>Ivy covering balustrade, potential damage caused</p>	
<p><b>12</b></p>	<p>Section 7</p>	<p>Metal plate, potentially covering crack or adding support</p>	

<p><b>13</b></p>	<p>Between sections 8 and 9</p>	<p>Cracked off east corners</p>	 A close-up photograph of several stacked, rectangular stone blocks. The top block is slightly offset to the right. A vertical crack is visible on the east corner of the second block from the top. The stone is a light grey color with some darker speckling. A small black sign with white letters 'ACE' is partially visible on the left side of the blocks.
<p><b>14</b></p>	<p>Between sections 8 and 9</p>	<p>Cracked off north corners</p>	 A close-up photograph of several stacked, rectangular stone blocks. The top block is slightly offset to the left. A vertical crack is visible on the north corner of the second block from the top. The stone is a light grey color with some darker speckling. A small black sign with white letters 'UN' is partially visible on the right side of the blocks.

<p><b>15</b></p>	<p>Section 9 Slab 9</p>	<p>Chip along inner edge</p>	
<p><b>16</b></p>	<p>Section 11 Slab 5</p>	<p>Chipped along inner edge</p>	







<p><b>17</b></p>	<p>Section 12 Slab 12</p>	<p>Chipped along outer edge</p>	
<p><b>18</b></p>	<p>Section 14 Slab 10</p>	<p>Chipped and cracked along outer side</p>	



<p><b>19</b></p>	<p>Section 15 Balustrade 6</p>	<p>Crack through bottom neck</p>	
<p><b>20</b></p>	<p>Section 16 Slab 5</p>	<p>Big chip on outer side</p>	

<p><b>21</b></p>	<p>Section 16 Balustrade 6</p>	<p>Chipped in centre section</p>	
<p><b>22</b></p>	<p>Section 16 Balustrade 11</p>	<p>Crack through upper neck</p>	

<p><b>23</b></p>	<p>Section 16 Balustrade 12</p>	<p>Crack through upper neck</p>	
<p><b>24</b></p>	<p>Section 16 Balustrade 12</p>	<p>Crack through lower neck</p>	

<p><b>25</b></p>	<p>Section 18 Slab 6</p>	<p>Crack in outer side</p>	 A close-up photograph of a concrete slab. A distinct crack runs horizontally across the top surface of the slab. Below the slab, a metal mesh fence is visible, and some greenery is seen in the background.
<p><b>26</b></p>	<p>Section 18 Balustrade 9</p>	<p>Out of place at top of balustrade (crooked)</p>	 A photograph of a stone balustrade. The balustrade consists of several stone balusters. The top section of the balustrade is crooked, leaning to the right. The balusters are made of light-colored stone. The ground in front of the balustrade is paved with concrete and has some fallen leaves.

<p><b>27</b></p>	<p>Section 19 Slab 9</p>	<p>Chip in outer side</p>	 A close-up photograph of a stone balustrade slab. The slab is made of light-colored, textured stone. On the right side of the slab, there is a distinct chip or missing piece of stone. Below the slab, a metal mesh fence is visible, and the ground appears to be paved with some small plants growing between the stones.
<p><b>28</b></p>	<p>Section 19 Balustrade 1</p>	<p>Crack in south of upper neck</p>	 A close-up photograph of a stone balustrade post. The post is made of light-colored, textured stone. It has a decorative upper neck section. A vertical crack is visible on the right side of the upper neck. To the right of the post, a metal mesh fence is visible, and the background shows some greenery and a building.

<p><b>29</b></p>	<p>Section 19 Balustrade 3</p>	<p>Crack around the middle</p>	
<p><b>30</b></p>	<p>Section 20 Balustrade 1</p>	<p>Crack in south of middle section</p>	


<p><b>31</b></p>	<p>Section 21</p>	<p>Cracked north east corner</p>	 A photograph showing the north-east corner of a stone wall. The wall is constructed from large, rectangular, grey stone blocks. A distinct vertical crack is visible in the corner joint. In the background, there is a green sign with a crest and some trees.
<p><b>32</b></p>	<p>Section 22</p>	<p>Cracked north east corner</p>	 A photograph showing the north-east corner of a stone wall, similar to the one in the first row. The stone blocks are grey and rectangular. A crack is visible in the corner joint. The background shows a paved area with some fallen leaves and a building in the distance.





<p><b>33</b></p>	<p>Section 22 Balustrade 10</p>	<p>Crack through base</p>	 A close-up photograph of a stone balustrade base. The stone is dark grey and shows a vertical crack running through the base. A small green plant is growing from the base of the stone.
<p><b>34</b></p>	<p>Section 25 Balustrade 5</p>	<p>Crack through bottom neck</p>	 A close-up photograph of a stone balustrade base. The stone is light grey and shows a horizontal crack through the bottom neck. A wire mesh fence is visible in the background.

<p><b>35</b></p>	<p>Section 25 Balustrade 35</p>	<p>Crack through bottom neck</p>	
<p><b>36</b></p>	<p>Section 25 Balustrade 38</p>	<p>Chipped in upper section</p>	

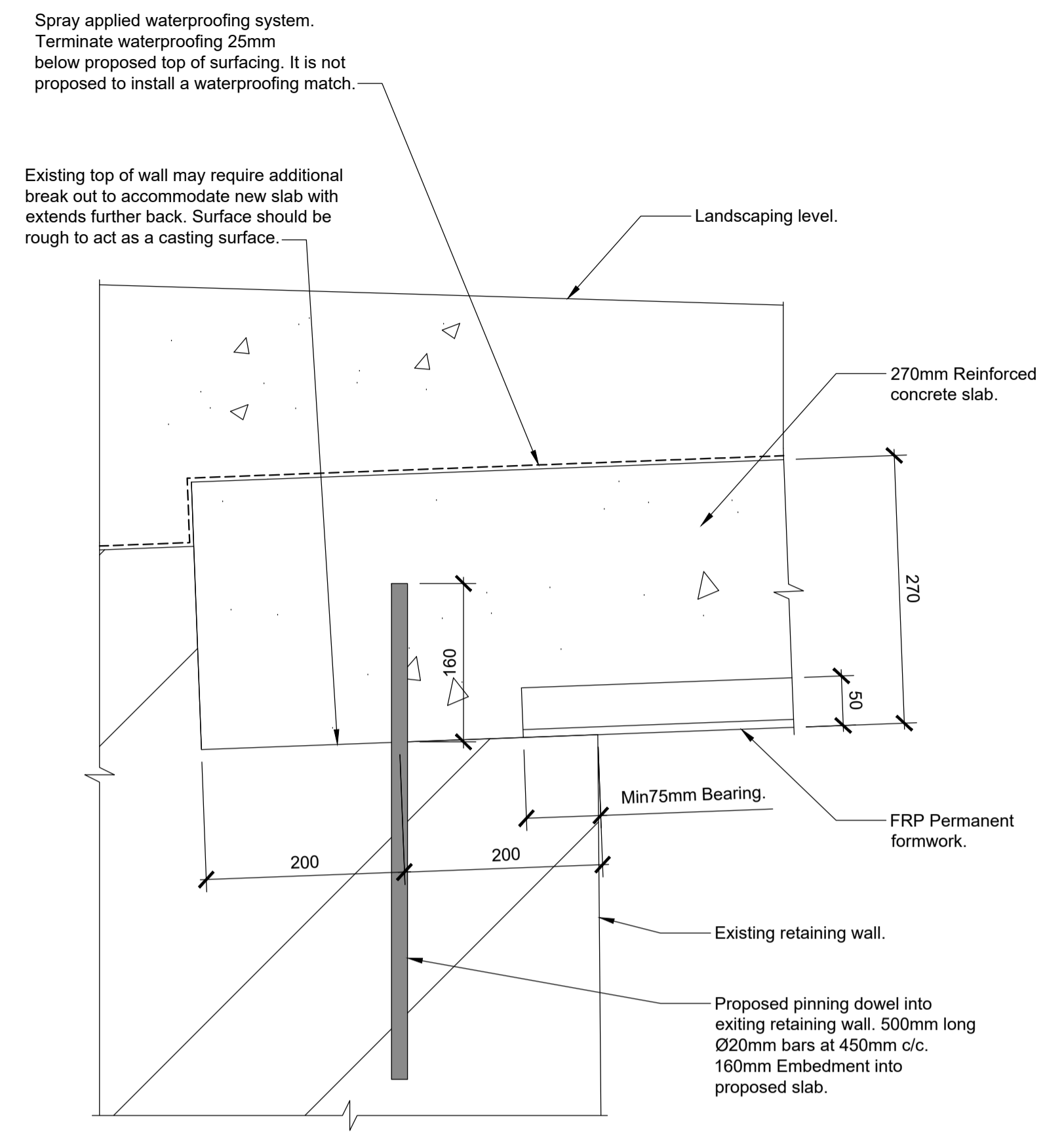
<p><b>37</b></p>	<p>West Union Street Section Balustrade 9</p>	<p>Crack through bottom neck</p>	 A close-up photograph of a stone balustrade post. The post is made of dark, speckled granite and consists of a large spherical top, a smaller neck, and a square base. A horizontal crack is visible through the bottom of the neck, just above the base. The background shows a chain-link fence and some greenery.
<p><b>38</b></p>	<p>West Union Street Section Balustrade 11</p>	<p>Crack through bottom neck</p>	 A close-up photograph of a stone balustrade post, similar to the one in the first image. It features a spherical top, a neck, and a base. A horizontal crack is clearly visible through the bottom of the neck. The background includes a chain-link fence and some foliage.

<p><b>39</b></p>	<p>East Union Street Section Balustrade 3</p>	<p>Crack through bottom neck</p>	
<p><b>40</b></p>	<p>East Union Street Section Balustrade 4</p>	<p>Crack through bottom neck</p>	

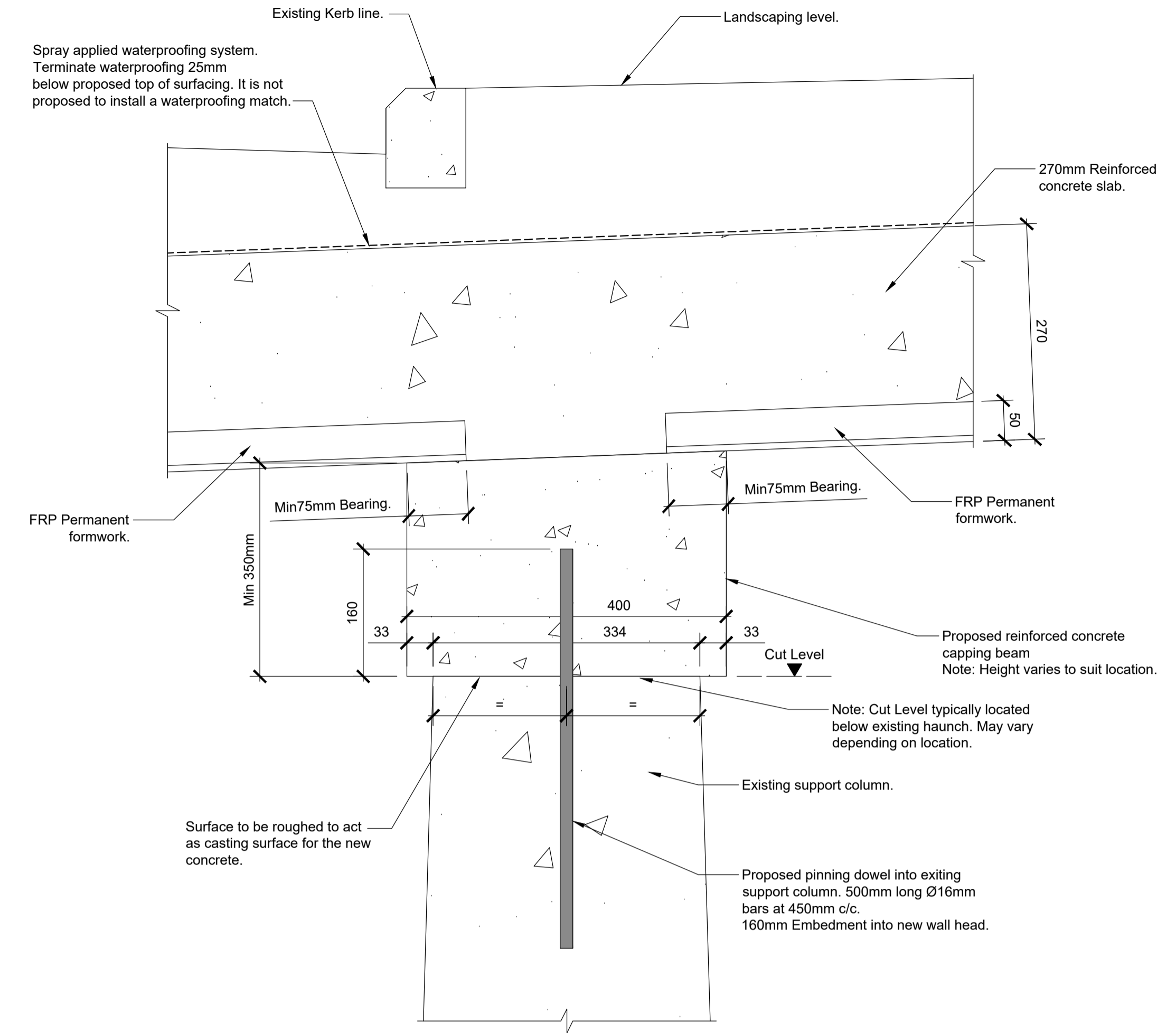
<p><b>41</b></p>	<p>East Union Street Section Balustrade 5</p>	<p>Crack through bottom neck</p>	
<p><b>42</b></p>	<p>East Union Street Section Balustrade 7</p>	<p>Crack in bottom neck</p>	

<p><b>43</b></p>	<p>East Union Street Section Bottom Slab</p>	<p>Crack in outer edge</p>	 A close-up photograph of a concrete slab, likely part of a bridge or overpass. The concrete is light gray and shows signs of weathering and discoloration. A prominent vertical crack runs down the center of the slab, extending from the top edge towards the bottom. The crack is filled with a dark, possibly mossy or organic material. A metal railing, consisting of a horizontal bar and two diagonal supports, is visible in the foreground, partially obscuring the view of the slab. The railing is made of a light-colored metal, possibly galvanized steel.
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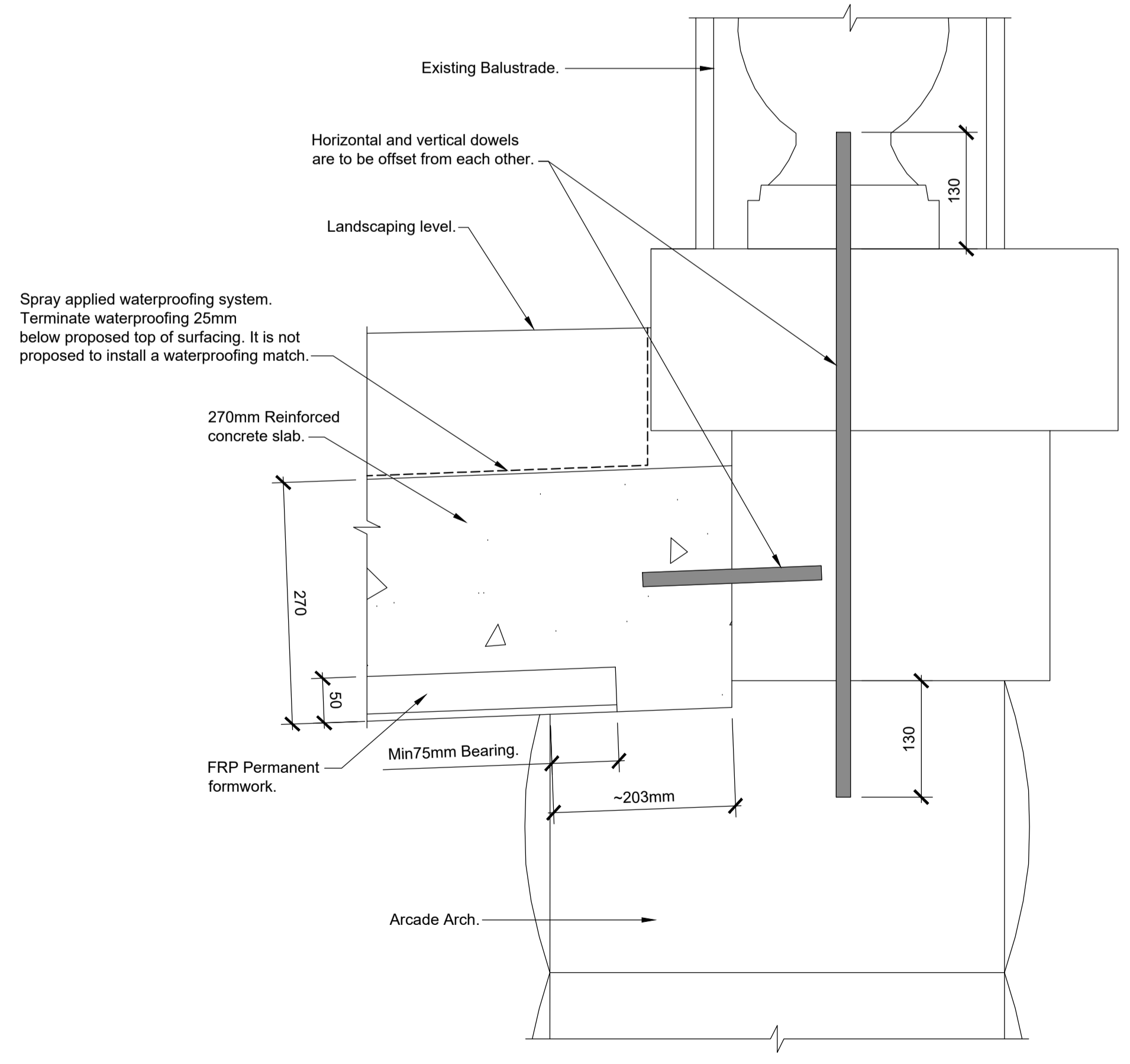
# Appendix 2



Detail A Scale 1:5



Detail B Scale 1:5



Detail C Scale 1:5

- Notes**
- All dimensions are in millimetres unless noted otherwise.
  - Dimensions are based on historic drawings and are to be confirmed on site by contractor prior to construction design.
  - This drawing is to be read in conjunction with Drg. Nos. UTG-ARP-AR-ZZ-DR-CS-0101 & 0102.

F01	24 /04/20	GB	EM	MD
Preliminary Design Issue.				
Rev	Date	By	Chkd	Appd

# ARUP

Scotstoun House, South Queensferry  
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Tel +44 (0)131 331 1999 Fax +44 (0)131 331 3730  
www.arup.com

Client

## Balfour Beatty

Project Title  
**Union Terrace Gardens**

Drawing Title  
**Typical Arcade Arche Slab Replacement Details Sheet 2 of 2.**

Scale at A1 As Shown

Role Civil Structures

Suitability S3 - Suitable for Review and Comment

Arup Job No <b>270959-00</b>	Rev <b>F01</b>
---------------------------------	-------------------

Name  
**UTG-ARP-AR-ZZ-DR-CS-0103**



## General Notes Drawings

### Concrete

- All concrete should be assumed to be a C40/50 infrastructure mix.
- All edges to have 25x25 chamfers.
- Surface finishes to be as follows:
  - Waterproofed surfaces - Class F4/U4.
  - Formed surface - Class F3
  - Exposed surfaces - U3
- All reinforcement to be:
  - Grade B500B to BS 4449 and EN 10080.
  - All rebar bending to be in accordance with BS 8666.
  - Stainless steel rebar to be Grade 500 to BS 6744 sub-grade 1.4429 or 1.4436.

### Permanent formwork

- FRP permanent formwork is proposed and should be compliant to BA 36/99. EMJ Permadeck or similar.
- The final specification of the permanent formwork should take cognisance of the wet weight of concrete and Construction Loading as defined by the Temporary Works Engineer.
- Edge support details should be as per manufactures requirements while 75mm has been allowed for and should be as per EMJ Standard Detail.

### Waterproofing

- Spray applied waterproofing in accordance with Series 2002 of the MCHW. GCP Eliminator or similar approved.
- A min of 100mm laps should be allowed for between waterproofing sections, or as recommended by the subcontractor.
- No new back of wall drainage is proposed at current.
- No subsurface drainage is proposed either due to limited depth on top of the structure for surfacing.

### Pavement bedding

- The paving shall be as per the LDA Hard Landscaping drawings.
- The existing surfacing is to be laid to the same level and fall as per the existing surfacing.
- The paving slabs shall have a maximum of 50mm of depth and may require cutting to achieve this. The LDA Hard Landscaping Specification should be reviewed against this.
- The paving slabs shall bedded in accordance with Series 1104.2. A layer of sand conforming to BS EN 12620 designation 0/4 mm. Joints to be filled with sand conforming to BS EN 12620 designation 0/2.

### Paint/Corrosion protection

- Ladies toilets steel beam is assumed to be painted with an intumescent paint to provide adequate fire durability which is 30min, see Architect details for paint system.

### Masonry mortar specification

- Epoxy for steel dowel connections compliant to BS EN 1504.
- For masonry reassembly and repointing a grade II/M6 mortar should be used.

### Excavation backfill

- Given proximity to existing structures, backfilled concrete is proposed as GEN1/SI2.

### Steel beam specification.

- All steelwork shall comply with the Specification which refers to BS EN 1090-2.
- All steelwork to be S355J2 to EN 10025.
- Execution class is to be EXC3.
- Shear connectors to be Type SD1 to En 13918 with a UTS of 450 MPA.

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Client

## Balfour Beatty

Project Title

Union Terrace Gardens

Drawing Title

Arcade Arches  
General Notes

Scale at A1

Role

Civil Structures

Suitability

S3 - Suitable for Review and Comment

Arup Job No

270959-00

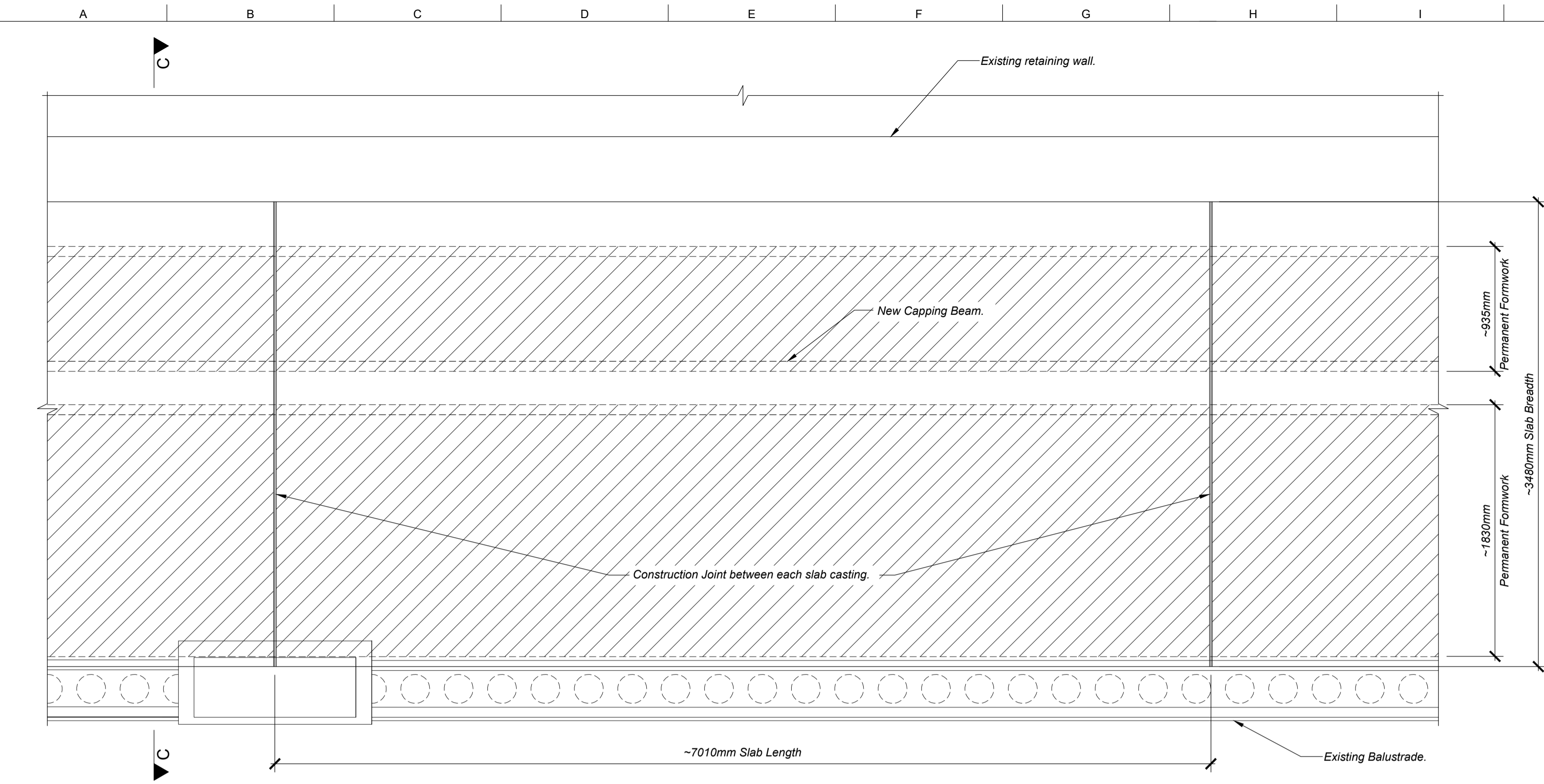
Rev

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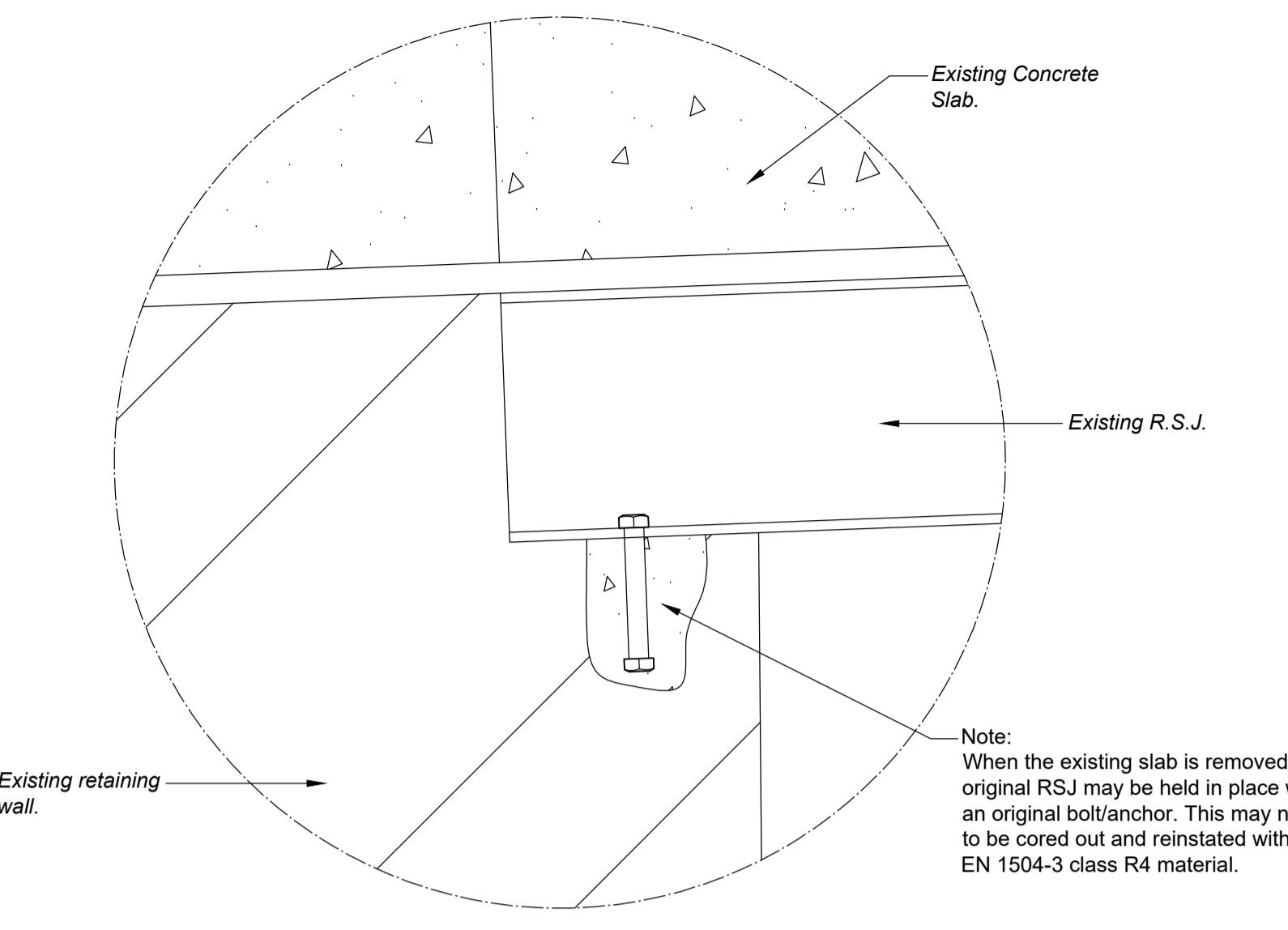
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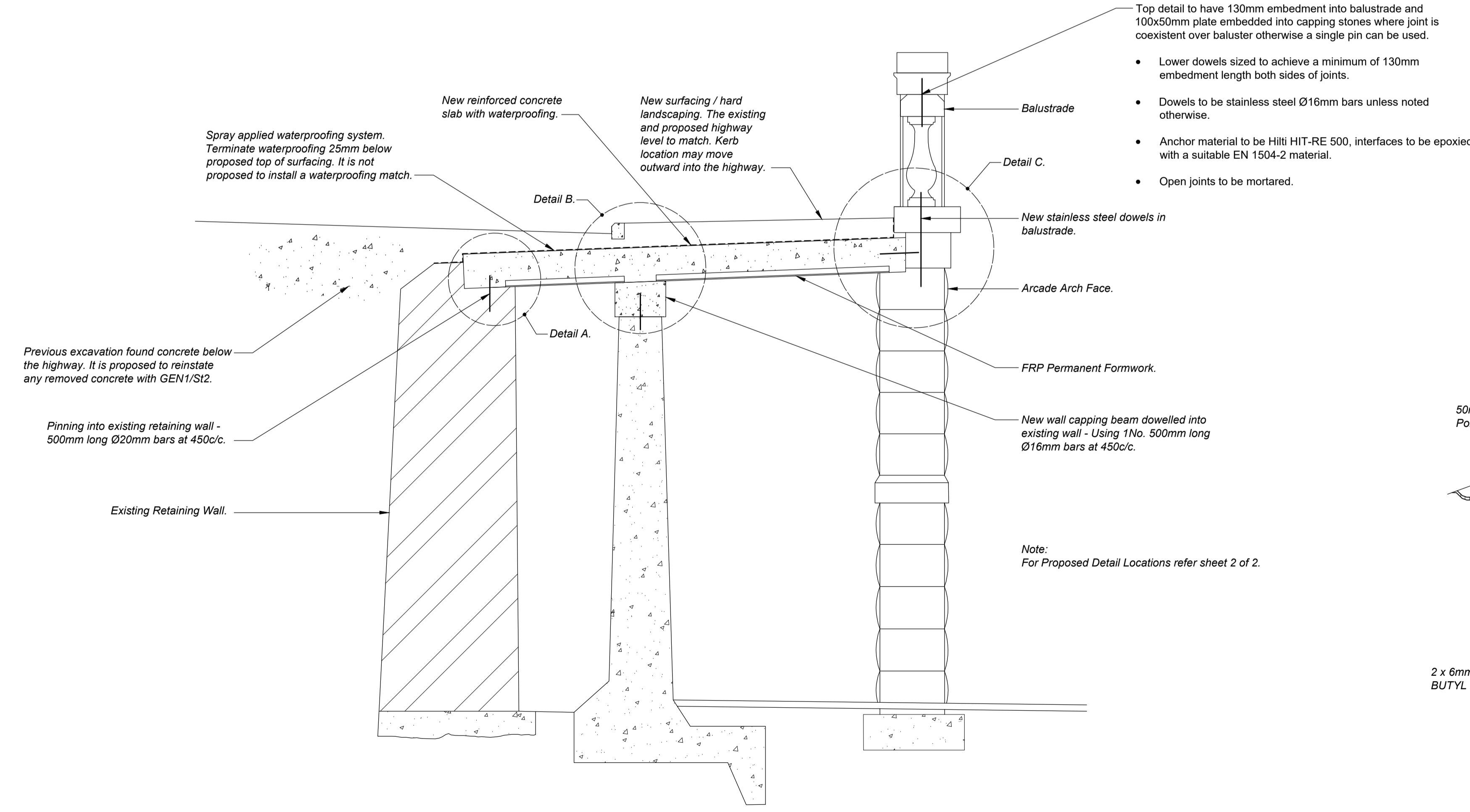


**Typical Arcade Arch Plan**  
Scale 1:25

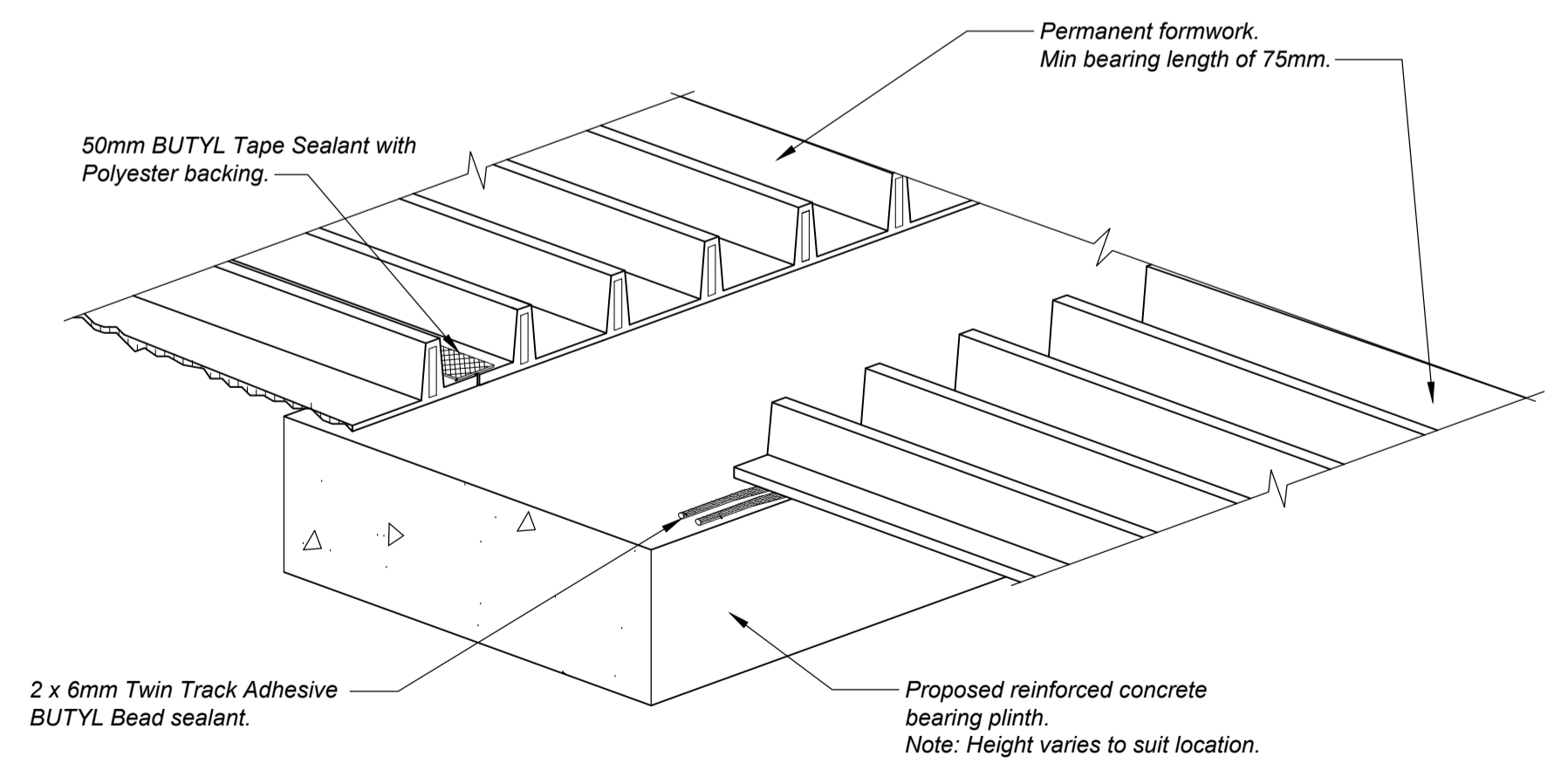


**Detail A Existing Case**  
Scale 1:5

- Notes**
- All dimensions are in millimetres unless noted otherwise.
  - Dimensions are based on historic drawings and are to be confirmed on site by contractor prior to construction.
  - Drawing to be read in conjunction with Drg. No. UTG-ARP-AR-ZZ-DR-CS-0101 for location of sections & Drg. No. UTG-ARP-AR-ZZ-DR-CS-0103 for details.
  - See General Notes drawing UTG-ARP-AR-ZZ-GN-CS-0001 for high level specification.
  - The permanent formwork bearing length is proposed as 75mm as advised by EMJ Plastics, if the supplier is changed this requirements may also change.
  - Proposed EMJ Plastics permanent formwork is Type 1B and 3A, this should be verified by the temporary works engineer for construction loading requirements.
  - Once the existing slab is removed from the existing retaining wall and arch, remedial works may be required to the wall head. It is assumed that a shallow layer of leveling mortar will be required.
  - Proposed scope of works for Typical Arcade Arches:
    - Demolition and renewal of rear slab and jack arch.
    - Pinning of the granite balustrade.
  - The new slab will be at the same level as the existing with internal soffit level maintained.
  - Assumed construction sequence:
    - Carefully take down and store balustrade.
    - Prop arch as required.
    - Demolish existing slab/jack arches and cut down top of wall.
    - Cast new RC wall head.
    - Place permanent formwork.
    - Cast new slab.
    - Tie balustrade together (stainless steel dowels) and reinstall.
    - Apply waterproofing
    - Lay surfacing/hard landscaping



**Section C-C Typical Arcade Arch**  
Scale 1:25



**Indicative EMJ Detail Showing Sealant System to Permanent Formwork**  
Scale 1:5

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Client

**Balfour Beatty**

Project Title  
**Union Terrace Gardens**

Drawing Title  
**Typical Arcade Arche Slab Replacement Details Sheet 1 of 2.**

Scale at A1	As Shown
Role	Civil Structures
Suitability	S3 - Suitable for Review and Comment
Arup Job No	Rev
<b>270959-00</b>	<b>F01</b>
Name	
<b>UTG-ARP-AR-ZZ-DR-CS-0102</b>	