Discharge of Listed Building Consent Conditions: Union Mill (Batley) Viaduct (MDL1/27)

2022/65/90276/E Conditions 3, 4, and 5

Document Reference: TP/LNE/2024-075

Network Rail

July 2024



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1. INTRODUCTION

1.1 Background

1.1.1 The Scheme is part of a wider programme of works under the Trans-Pennine Route Upgrade (TRU) which will improve the Trans-Pennine railway between Manchester, Huddersfield, Leeds and York and improve connections between key towns and cities across the north of England.

1.1.2 The works to which this document relate lie within the TRU W4 Scheme between Westtown (Dewsbury) and Leeds which will contribute to the overall TRU aims of increasing service capacity and offering journey time benefits. This will deliver upgrades to the existing railway line including electrification of the line, increase in line speeds and remodelling of stations, as well as various other engineering works necessary to realise the benefits of the scheme including alterations to existing bridge structures.

1.1.3 The TRU W4 works necessitate the electrification of the railway at Union Mill (Batley) Viaduct (MDL1/27) to facilitate the public benefits of the upgraded railway. A Listed Building Consent (LBC) Application referenced 2022/65/90276/E, to install Overhead Line Electrification (OLE) portals and supporting brackets on Union Mill (Batley) Viaduct (MDL1/27) was approved subject to conditions on 8 April 2022.

1.1.4 This submission sets out details in relation to Conditions 3, 4 and 5 of the approved Listed Building Consent for the works. A separate submission will be made to discharge Condition 6 which secures the Level 1 programme of historic building recording of the viaduct[1].

[1] On the Decision Notice letter issued by Kirklees Council, the condition to secure Historic Building Recording is erroneously labelled as a duplicate Condition 5.

2. INFORMATION INCLUDED IN THIS SUBMISSION

2.1.1 The wording of Conditions 3, 4 and 5 attached to the granted Listed Building Consent application is reproduced in Table 2-1, along with a brief overview of the information submitted in order to discharge the relevant conditions.

Table 2-1 Details of information provided in relation to Conditions 3, 4 and 5

Condition reference	Details of condition	Section reference and Material Submitted
3	Detailed designs and drawings at a scale of 1:10 - 1:20 and report, including method and detail of fittings of the OLE brackets shall be submitted for approval by the Local Planning Authority.	Section 3: Methodology details for fixing of OLE brackets and structures. Appendix A: Supplementary detailed drawings.
4	Detail of all mortar specifications for repointing and repair works shall be submitted to the Local Authority for approval.	Section 4: Detail of mortar specification.
5	Detail of masonry repairs shall be submitted for approval by the Local Planning Authority. This shall include details of any replacement materials.	Section 5: Detail of masonry repairs. Appendix A: Supplementary detailed drawings.

3. CONDITION 3: OLE DETAILS AND METHOD STATEMENT

3.1 Background

3.1.1 Union Mill (Batley) Viaduct (MDL1/27) is made of rock faced Pennine Lower Coal Measure sandstone and dressed stone vaults, and is adorned with stepped arch rings and rusticated v-joined ashlar voussoirs. These features contribute to the viaduct's overall aesthetic value by reflecting the engineering of the 1840s and 50s, and evidencing Thomas Grainger's design influence which elevate the structure beyond the purely functional.

3.1.2 To ensure the OLE attachments are fixed to the Grade II Listed Building in a manner which preserves the appearance and character of the Listed viaduct, the Local Planning Authority attached Condition 3 which requires submission of details of design and methodology for the proposed installation of the OLE bracketry. The condition wording also includes the requirement for additional detailed drawings for the attachment of the OLE structures.

3.2 Proposal

3.2.1 The OLE will be attached Union Mill (Batley) Viaduct (MDL1/27) using the following approach:

- Install temporary working platform
- Undertake repairs to masonry and localised breakout if required (detailed further in Section 5 below)
- Drill anchor holes and install resin anchors for the drilling rig
- Install and test the anchors
- Install the top frame of bracket, main UC beams and bracing with grouting behind wall plates
- Install bottom frame along with plate and angle supports to the tip frame of bracket
- Undertake grouting between bracket and spandrel wall
- OLE masts to be lifted into position and bolted to the top bracket in temporary form.

3.2.2 In order to safely erect the temporary working platforms required to facilitate the installation of the eight OLE V-shaped brackets (four on each elevation) to the spandrel walls, vegetation clearance on the embankments at either end of the viaduct may be necessary. If vegetation is to be removed on the Listed structure itself, this will be undertaken by raking out joints and repointing as part of the general repair works (see below, Section 5).

3.2.3 Temporary measures required to prepare the structure for the installation of the OLE may also include the installation of temporary anti-bird spikes, if deemed necessary by the construction team. If required, these will be fixed in place using cable ties to the top of the proposed bracketry, before installing the OLE masts; this approach has been shaped to avoid fitting directly to the viaduct.

3.2.4 Once the working area has been suitably prepared, temporary freestanding scaffolding and platforms will be erected around the piers where possible, with alternate mobile elevated working platforms (MEWPs) and/or topside access utilised where necessary. No on-site compound is required for these works, rather the OLE steelwork will be stored at the nearest local TRU Alliance rail systems compound in Huddersfield and transported to site using the railway during the installation shift. Track-mounted plant from within the railway boundary will be used to lift the masts and all other elements required to undertake the works.

3.2.5 A total of eight brackets (four on each elevation) over piers 3, 7, 11 and 15 are to be installed on the spandrel walls of the viaduct. Ahead of their installation, preparatory repairs

to the masonry on the spandrel walls will be required. These are described in more detail in Section 4 below, as part of the requirement of Condition 5 attached to the LBC. The wall surface will be scabbled via localised break-back of masonry surfaces to provide a smooth level of installation of the bracketry steelwork. This will only be undertaken for areas where the steelwork will come into contact with the wall for fixing and will not be visible following the installation of the brackets. This process will be undertaken either by hand through cold-chiselling techniques, or mechanically with a rotary tool, if necessary.

3.2.6 A drilling rig will be used to core the holes into the viaduct for fixing the OLE brackets; this rig will itself need to be attached to the viaduct temporarily. The drilling rigs will be installed by handheld coring rigs which don't need temporary mounting. If mounting rigs are required, these will be secured with temporary mechanical anchors, not permanently resin fixed to the viaduct. The cores for the drilling rig will be 10mm in diameter x 100mm long and once the works are finished they will be grouted and not visible.

3.2.7 Once attached to the viaduct, holes will be cored by the drilling rig to the required depth for fixing the OLE brackets. The rig will drill at a depth of 900mm for the top bracket and 580mm for the bottom brackets. The brackets will then be installed below the masonry string course and will each be fixed into the wall with 10 Galvanised Threaded anchors: five 1100mm long anchors on the top and five 750mm anchors on the bottom brackets.

3.2.8 The top bracket will be 1680mm wide and consist of a PFC (parallel flange channel) base plate, main UC (universal column) beams and bracing which will be bolted onto the wall (see drawing number 151667-TSA-41-MDL1-DRG-C-ST-042708 in Appendix A). The bottom bracket will be 700mm x 500mm x 25mm with angled supports.

3.2.9 A 30mm layer of grout (Webercem Grout Eco) will be applied to the back of the bracket, between the anchors, plates and the spandrel wall for further support. The requirement for the brackets to be securely embedded to the wall necessitates the use of particular grout types, as opposed to lime-based products. Once the brackets have been installed and securely fastened to the masonry wall, each OLE mast will then be able to be lifted into position, and secured to the top brackets by bolting it into the bracket to form the moment connection.

3.2.10 Detailed design drawings showing the OLE brackets and their fixings (at a scale of 1:10) are included in Appendix A.

4. CONDITION 4: MORTAR MATERIAL SPECIFICATIONS

4.1 Background

4.1.1 The appearance of masonry walls of Union Mill (Batley) Viaduct (MDL1/27) is partly characterised by the style and finish of mortar joints. To ensure that any consented works involving intervention into existing or new mortar joints are finished in a manner which preserves the appearance and character of the Listed viaduct, the Local Planning Authority attached Condition 4 which requires submission of specification details for the application of mortar for repointing and repair works.

4.2 Proposal

4.2.1 Mortar is proposed to be used as part of both the works to affix the OLE to the structure, and the general masonry repairs being undertaken as further specified under Condition 5 of the LBC (see Section 5). The mortar specification for each element of the works has been shaped by both the structural requirements associated with the works and also an effort to respond to the historic masonry of the structure and minimise change.

4.2.2 Where mortar will be applied as part of the general repairs, prior to installation of the OLE bracketry, this mortar is required to set to 60% of its final strength before the brackets are installed; this will comprise setting for a minimum of 24 hours.

4.2.3 Preparatory repair work will be undertaken in accordance with the appropriate required Network Rail standards specification[2]. Repair work will be undertaken from the temporary working platforms which are installed for the bracket installations (see paragraph 3.2.4). Lime mortar will be used for these repairs. This will comprise an NHL5 lime mortar mix, with a ratio of 1:2 lime:sand; this will match the approach taken for similar repairs on other Listed structures on the TRU programme.

4.2.4 Mortar will also be used for bedding the masonry anchors. The threaded bars and the injectable hybrid mortar will be inserted into the 40mm diameter oversized holes to secure the bracket fixing to the spandrel wall. This will be done using HIT-HY-270 hybrid anchor mortar. It is necessary to use this for the OLE brackets to meet the standards for securely and safely fixing the OLE into the structure.

[2] Network Rail. 2018, NR/CIV/SD/TUM/101 Technical User Manual: For the Application of Standard Brickwork and Masonry Repair.

5. CONDITION 5: MASONARY REPAIRS

5.1 Background

5.1.1 Union Mill (Batley) Viaduct (MDL1/27) is noted for being made with Pennine Lower Coal Measures sandstone and dressed stone vaults, which are contributing factor to its architectural quality and overall monumental engineering form designed by Thomas Grainger. To ensure the viaduct retains is overall appearance and character, the Local Planning Authority has attached Condition 5 which requires submission of details of any masonry repairs to be undertaken and of any replacement materials if required.

5.2 Proposal

Planned Masonry Repairs

5.2.1 Standard masonry repairs will be undertaken to the spandrel wall elevations ahead of installing the OLE. These preparatory repairs will be undertaken in accordance with the appropriate required Network Rail standards specification[2]. These localised masonry repairs will be limited to the areas on each elevation surrounding where the OLE bracketry will be fixed; this would correlate to the areas behind each bracket and 1m on either side, and extending the full length of the spandrel, as shown in Appendix A (drawing numbers 151667-TSA-41-MDL1-DRG-C-ST-042706 and 151667-TSA-41-MDL1-DRG-C-ST-042707). These works will be undertaken from the scaffolding erected as part of the bracket installations.

5.2.2 The repair work will be limited to repointing, as well as isolated re-bedding of stonework and/or stitching of fractures, where required. The repair specification essentially constitutes a like-for-like approach, with no blockwork to be replaced with new masonry. This specification of the standard suite of repairs has been approved based on the findings of the most recent detailed structures examinations and assessment reports conducted on behalf of Network Rail.

5.2.3 Following these works, the surface of the spandrel walls will be prepared for the brackets by being scabbled / chiselled down to create a level surface. This will be undertaken by localised break-back of masonry surface to provide smooth level for installation of bracketry steelwork. This will be undertaken to areas where the steelwork comes in contact with the wall for fixing and therefore will not be visible following installation. The process will be done either by hand using cold-chiselling techniques or, if this is not safely practicable, mechanically using a rotary tool.

5.2.4 Detail of the mortar specification for the masonry repairs is included in Section 4 above to meet the requirements of Condition 4 attached to the granted LBC.

5.2.5 Detail of the masonry repair works are also shown on the drawings included in Appendix A.

Risk of Unforeseen Repairs

5.2.6 Safety measures have been embedded within the design process and, as a result, the final proposals include all possible risks and the mitigation required to lessen these risks through surveying and analysis. Through the detailed design process, an overarching general risk has been identified of the potential for structural issues with the spandrel wall, given its age and the nature of the works being undertaken. This risk has been limited though interpolation and extrapolation of discrete coring and trial pit information to form an assumed wall arrangement. From this, the risk of structural failure through a specification of brickwork

repairs in accordance with the appropriate Network Rail standard detail drawings series[3] was outlined. Any required repairs will be undertaken in advance of all other specified construction activities within this package of works. This structural risk has been further reduced through specification of a permeation grouting scheme to blocked up end-walls.

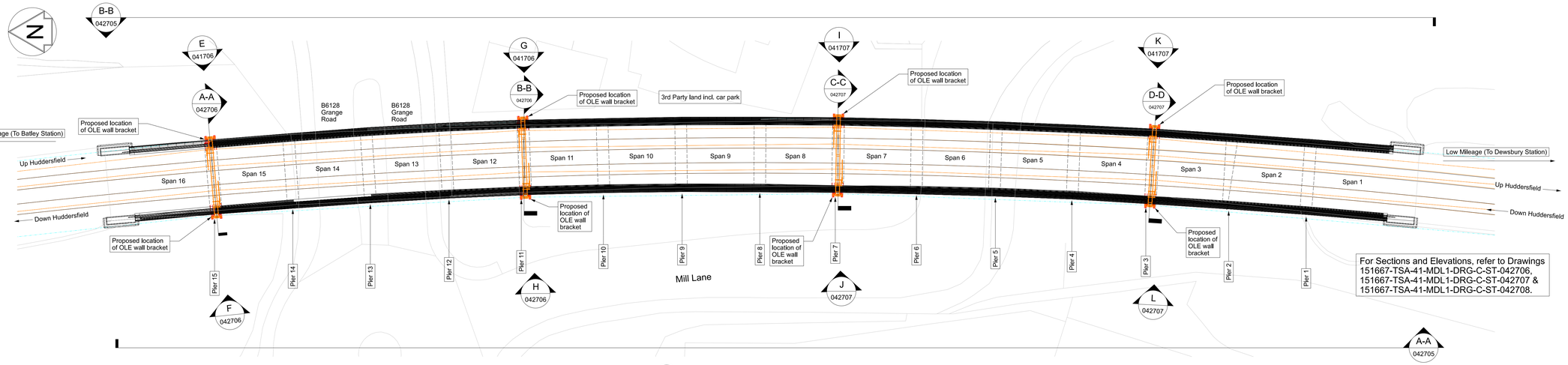
5.2.7 Despite the measures taken, the risk cannot be fully eliminated due to historic nature of existing retaining walls and potential for differing conditions on site to those assumed in analysis and design. During construction activities and temporary loading by plant the wall will be visually monitored. Any unforeseen repairs arising will be undertaken in line with the Network Rail standards for masonry repair (in line with the approach taken for planned repair works outlined above in paragraphs 5.2.1 and 5.2.2).

[3] In accordance with standard detail drawings NR/CIV/SD/100 series, included in Annexe 2 of Network Rail, 2018. NR/CIV/SD/TUM/101 Technical User Manual: For the Application of Standard Brickwork and Masonry Repair.

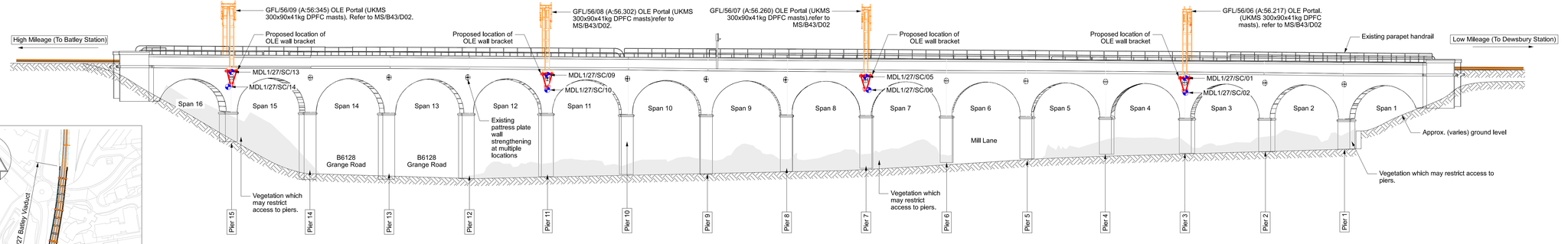
APPENDIX A – ACCOMPANYING DRAWINGS

P04

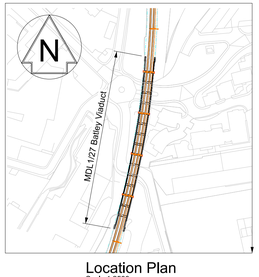
Drawing Number
151667-TSA-41-MDL1-DRG-C-ST-042705



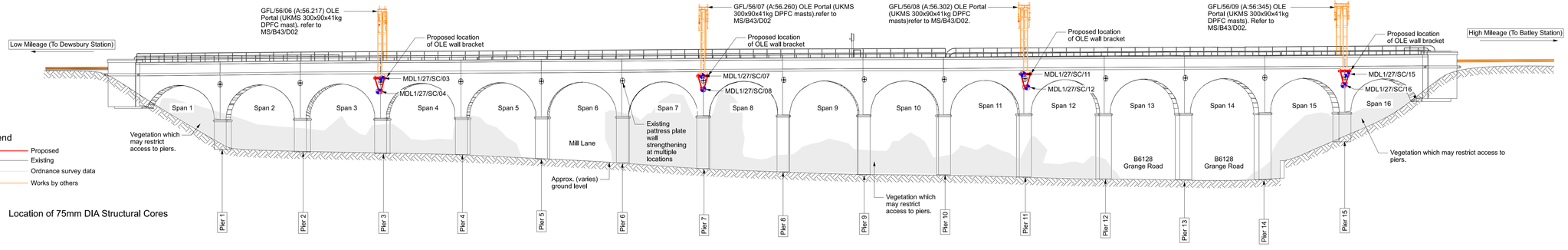
- Plan on MDL1/27 Union Mill Viaduct
042705 Scale 1:250



A-A 042705 West 'Down' Side Elevation
Scale 1:250



Location Plan
Scale 1:2500



B-B 042705 East 'Up' Side Elevation
Scale 1:250

Legend
- Proposed
- Existing
- Ordnance survey data
- Works by others

Key:
- Location of 75mm DIA Structural Cores

0 5 10 15 20 25m
SCALE 1:250

Legend/Notes

1. All dimensions are in millimetres unless noted otherwise.
2. Do not scale from this drawing.
3. This drawing is to be printed in colour.
4. To be read in conjunction with Drawings: 151667-TSA-41-MDL1-DRG-C-ST-042706, 151667-TSA-41-MDL1-DRG-C-ST-042707 & 151667-TSA-41-MDL1-DRG-C-ST-042708
5. The CDM Hazard Record is to be read in conjunction with this drawing: 151667-TSA-41-MDL1-RSA-W-SS-000001
6. To be read in conjunction with the Form B certificate of Design and Check: - 151667-TSA-48-MDL1-FOB-W-ST-000001
7. This drawing is based on OS Tiles, Network Rail record information and supplemented by the following Survey information:
   - MDL1/27 3D Wire Frame: 151667-TSA-W4-MDL1-DM3-X-MF-501001
   - MDL1/27 3D Wire Frame: 151667-TSA-W4-MDL1-DM3-X-MF-502001
   - MDL1/27 3D Wire Frame: 151667-TSA-W4-MDL1-DM3-X-MF-701355
   - MDL1/27 Point Cloud: 151667-TSA-W4-MDL1-DM3-X-MF-502501
   - MDL1/27 Coring + Trial Pits: 151667-TSA-W4-MDL1-DM3-X-MF-702014
   - MDL1/27 Trial Pit Logs: 151667-TSA-W4-MDL1-DM3-X-MF-701579
   - MDL1/27 Trial Pit Logs: 151667-TSA-W4-MDL1-DM3-X-MF-702815
8. Services information taken from TRU-TPEN Buried Services Model.
9. Dimensions shown of historic Structures are taken from varying Survey sources. As such all dimensions are to be verified by the contractor prior to commencing construction works.
10. All works to be undertaken in accordance with Network Rail standards NR/L2/CIV/140 Issue 12: Specifying Civil Engineering works and NR/L2/CIV/044 Issue 4.
11. Up/Down rail ID convention is taken from National Electronic Sectional Appendix:
    - Line of Reference: LN860 , Seq.003 (Diggle Jn. to Copley Hill East Jn.)
12. Condition and capacity of MDL1/27 is based on the following reports:
    - MDL1/27 Detail Exam, ID: 12068971 (Dated: 09/04/2021)
    - MDL1/27 Level 1 Assessment Report - Final (Dated 2019)
    - MDL1/27 Sensitivity Assessment Report - A02 (Dated 25/01/2022)
13. The previous assesment (2018) reports a capacity of RA10 at 75mph. The TRU sensitivity capacity undertaken determined a capacity of RA10@75mph however behaviour of the arch under this loading is unknown (incl. potential for ring separation).

Rev	Date	Description of Revisions	Drawn	Chkd	Appr
P02	19/10/21	Fix rendition issue & road names for F001 Submission	DH	NH	DR
P03	03/11/21	First Issue	PA	NH	DR
A01	25/04/22	First Issue	PA	NH	DR
P04	29/04/24	For IDC/R	LP	JI	NW

Status: Fit for Information
Suitability: S2

Authorised | Signed | Date

Contractor(s): TRU West Alliance

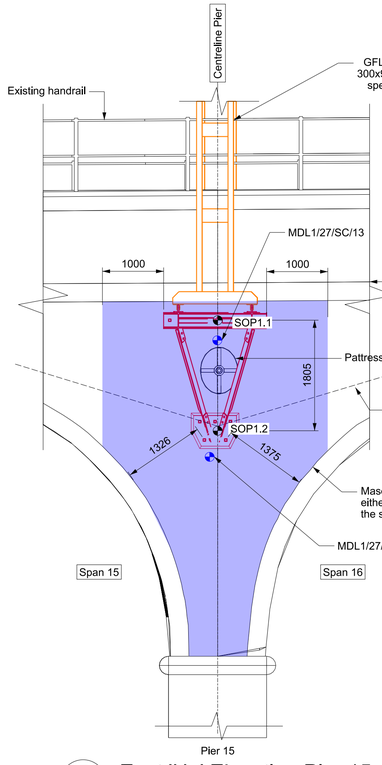
Location: THORNHILL LNW JN - HOLBECK EAST JN (MIRFIELD - LEEDS)
Type: CAD Drawing
Sub-type: General Arrangement
Role: Civil Engineer
Sub-Role: Structures and Buildings
Zone: Batley to Morley Tunnel - Area B
Phasing: Proposed
Project Stage: GRIP 4
Project: Transpennine Route Upgrade
Contract No.: 151667
Contract Title: TRU - West of Leeds
Drawing Title: W4 - Area B MDL1/27 - Union Mill (Batley) Viaduct - OLE Bracket Proposed General Arrangement

Designed	Y.Vorajee	Signed	Date 29/04/24
Drawn	L.Peters	Signed Electronically Signed	Date 29/04/24
Checked	J.Ingram	Signed Electronically Signed	Date 29/04/24
Approved	N.Wightman	Signed Electronically Signed	Date 29/04/24

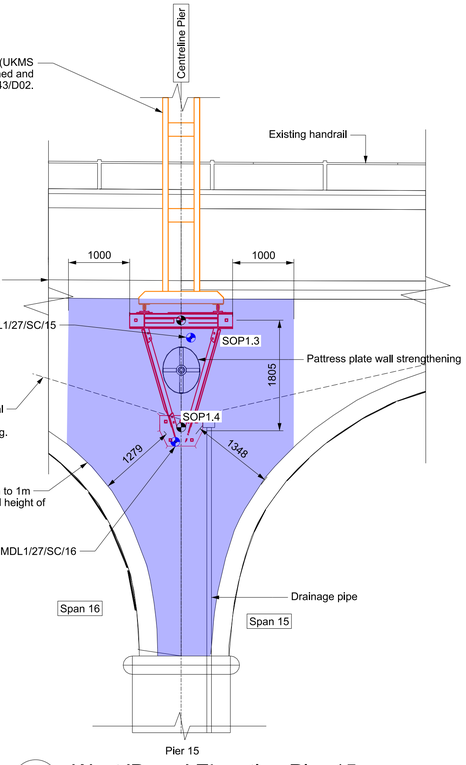
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Drawing Number: 151667-TSA-41-MDL1-DRG-C-ST-042705
Revision: P04

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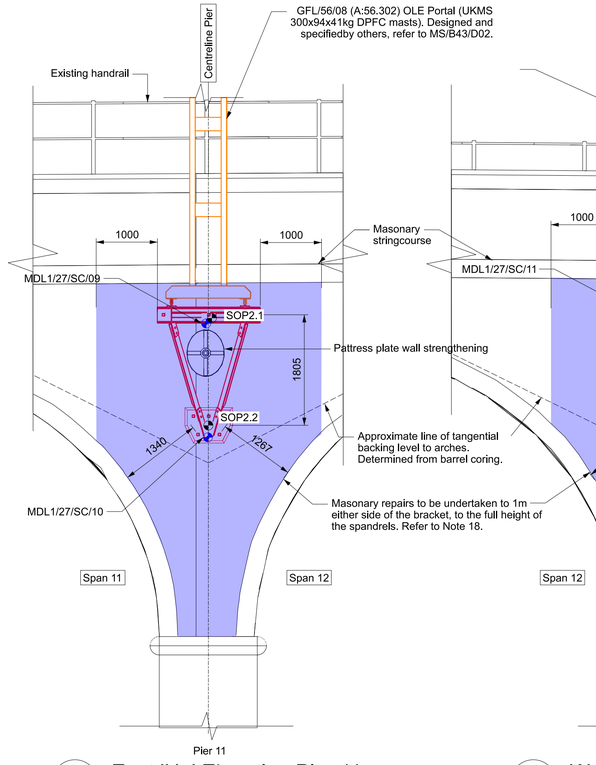
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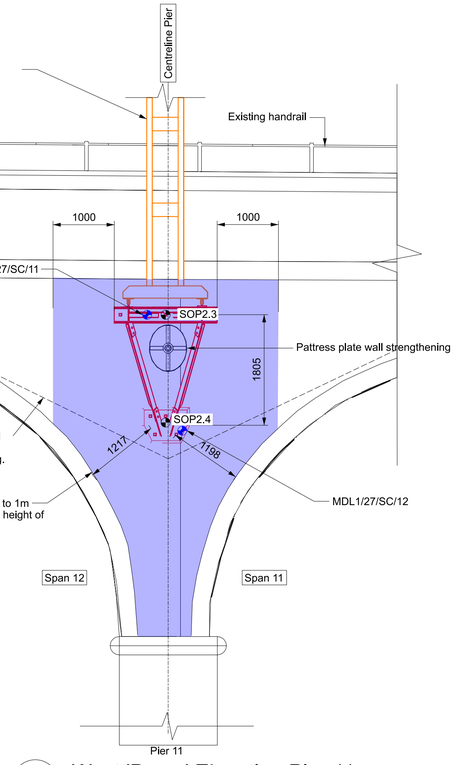
E 042705 **East 'Up' Elevation Pier 15**
Scale 1:50



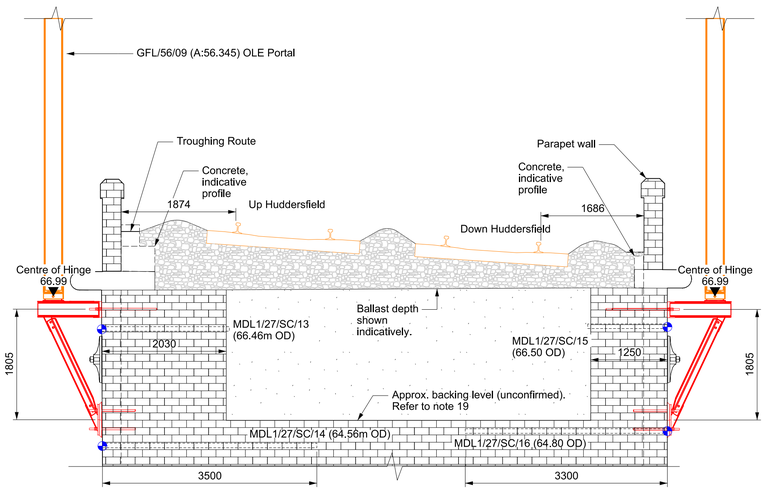
F 042705 **West 'Down' Elevation Pier 15**
Scale 1:50



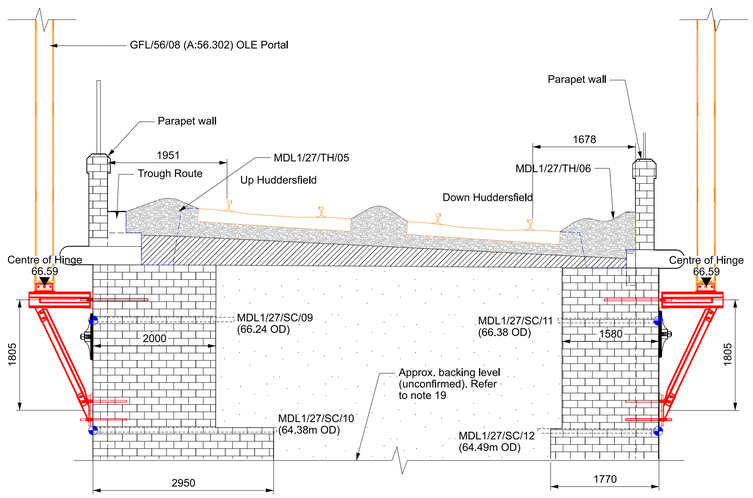
G 042705 **East 'Up' Elevation Pier 11**
Scale 1:50



H 042705 **West 'Down' Elevation Pier 11**
Scale 1:50



A-A 042705 **Section Through Pier 15**
Scale 1:50



B-B 042705 **Section Though Pier 11**
Scale 1:50

Structural Core Information				
Pier	Up Side			
	Top Core	Depth	Bottom Core	Depth
11	MDL1/27/SC/09	2.30m	MDL1/27/SC/10	3.00m
15	MDL1/27/SC/13	2.08m	MDL1/27/SC/14	3.50m
	Down Side			
	Top Core	Depth	Bottom Core	Depth
11	MDL1/27/SC/11	1.64m	MDL1/27/SC/12	1.97m
15	MDL1/27/SC/15	1.30m	MDL1/27/SC/16	3.30m

Key -

Location of Ø75mm Structural Cores

Sandstone Masonary:

Made Ground:

Coarse Granuar Fill:

Concrete:

Ballast:

Legend

- Proposed
- To be removed
- Existing
- Ordnance survey data
- Works by others

0 1 2 3 4 5m
SCALE 1:50

Safety, Health and Environmental Information

For Health and Safety information, refer to discipline specific Project Hazard Record.

Legend/Notes

1. All dimensions are in millimetres unless noted otherwise.
2. Do not scale from this drawing.
3. This drawing is to be printed in colour.
4. This drawing refers only to the Structures scope OLE bracketry works only
5. The CDM Hazard Record is to be read in conjunction with this drawing: 151667-TSA-W4-MDL1-RSA-W-SS-000001
6. All works to be undertaken in accordance with Network Rail standards NR/L2/CIV/140 Issue 12: Specifying Civil Engineering works and NR/L2/CIV/044 Issue 4.
7. Track monitoring shall be carried out in accordance with NR/L2/CIV/177, Issue 2, Monitoring Track over or Adjacent to Building and Civil Engineering Works.
8. Requirement for Anti-bird spikes in the temporary condition during construction to be reviewed by construction team.
9. This drawing is based on OS Tiles, Network Rail record information and supplemented by the following Survey information:
   - MDL1/27 3D Wire Frame: 151667-TSA-W4-MDL1-DM3-X-MF-501001
   - MDL1/27 3D Wire Frame: 151667-TSA-W4-MDL1-DM3-X-MF-502001
   - MDL1/27 3D Wire Frame: 151667-TSA-W4-MDL1-DM3-X-MF-701355
   - MDL1/27 Point Cloud: 151667-TSA-W4-MDL1-DM3-X-MF-502501
   - MDL1/27 Coring + Trial Pits: 151667-TSA-W4-MDL1-DM3-X-MF-702014
   - MDL1/27 Trial Pit Logs: 151667-TSA-W4-MDL1-DM3-X-MF-701579
   - MDL1/27 Trial Pit Logs: 151667-TSA-W4-MDL1-DM3-X-MF-702815
10. Dimensions shown of historic Structures are taken from varying Survey sources. As such all dimensions are to be verified by the contractor prior to commencing construction works.
11. Walls to be scabbled to reduce surface profile variation prior to settling out and drilling of anchors for fitment and constructibility purposes.
12. Alternate UP/DN brackets are to be installed 'square' to one another, or as far as reasonable practicable for fitment requirements with limited skew permissible in hinge base fixtures and OLE structures.
13. OLE position based on the latest OLE deliverables:
   - Layout Plan: 151667-TSA-W4-MDL1-DRG-R-OH-110301
   - GFL/56/08 Cross Section: 151667-TSA-W4-MDL1-DRG-R-OH-110347
   - GFL/56/09 Cross Section: 151667-TSA-W4-MDL1-DRG-R-OH-110348
14. Construction tolerance for bracket position is +/- 20mm globally.
15. Setting Out Point (SOP) coordinates are at bolt/anchor fixing centres upon the masonry surface prior to scabbling (using point cloud data). The contractor is to verify fixing locations using total stations and templating methods. Clients Representative / Designer to be informed of discrepancies.
16. All works relate to fixing OLE supporting structure to Network Rail owned and maintained assets. Asset is Grade II listed. Works overhang third-party land. Negotiation/approval of access and siteworks are therefore required.
17. All dimensions relevant to position of the running rail edge (offsets and drops/heights) have been calculated using proposed TRU alignments.
18. Standard NR Specification masonry repairs shall be completed to spandrel elevations prior to installation of OLE in accordance with NR/CIV/SD/101 and the associated technical user manual. Use of standard repairs has been approved based on the following:
   - MDL1/27 Detailed Exam, ID: 12068971 (Dated 09/04/2021)
   - MDL1/27 Level 1 Assessment Report - Final (Dated 2019)
   - MDL1/27 Sensitivity Assessment Report - A02 (Dated 25/01/2022)
19. AECOM Drawing COCAFALNEY4-A114-14 (Version P0), containing barrel cores used to verify presence of backing and overlaid waterproofing

Rev	Date	Description of Revisions	Drawn	Chkd	Appr
P01	19/10/21	F001 Submission	DH	NH	DR
P02	03/11/21	First Issue	PA	NH	DR
A01	25/04/22	First Issue	PA	NH	DR
P03	29/04/24	For IDC/R	LP	JI	NW

Status: Fit for Information
Suitability: S2

NetworkRail

Authorised		Signed	Date

Contractor(s): TRU West Alliance

Location: THORNHILL LNW JN - HOLBECK EAST JN (MIRFIELD - LEEDS)

Type: CAD Drawing	Sub-type: Section
Role: Civil Engineer	Sub-Role: Structures and Buildings
Zone: Batley to Morley Tunnel - Area B	
Phasing: Proposed	Grip Stage: GRIP 4

Project: Transpennine Route Upgrade

Contract No.: 151667

Contract Title: TRU - West of Leeds

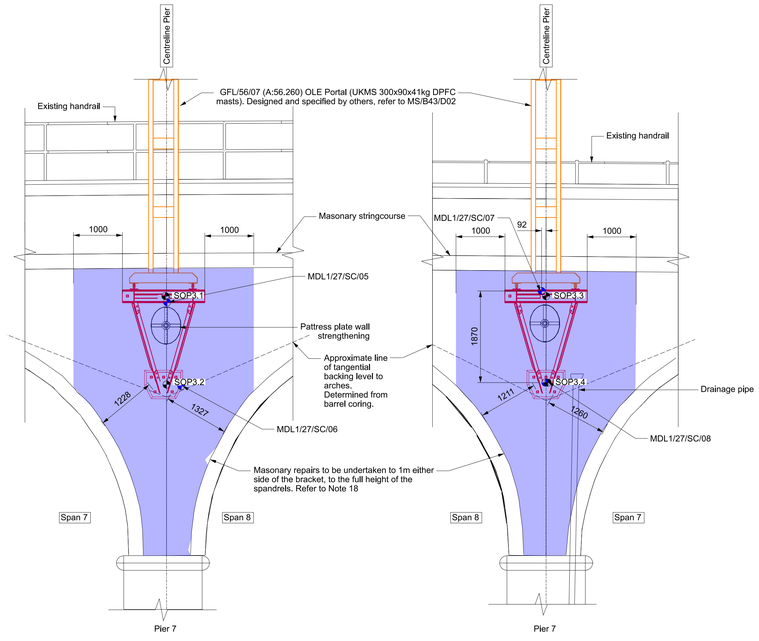
Drawing Title: W4 - Area B MDL1/27 - Union Mill (Batley) Viaduct - OLE Brackets Proposed Sections Sheet 1 of 2

Designed	Y.Vorajee	Signed	Date 29/04/24
Drawn	L.Peters	Signed Electronically Signed	Date 29/04/24
Checked	J.Ingram	Signed Electronically Signed	Date 29/04/24
Approved	N.Wightman	Signed Electronically Signed	Date 29/04/24

Scale(s): As Shown
ELR & Mileage: 34.1606 to 0
Alternative Reference
Sheet: 1 of 2
Drawing Number: 151667-TSA-41-MDL1-DRG-C-ST-042706
Revision: P03

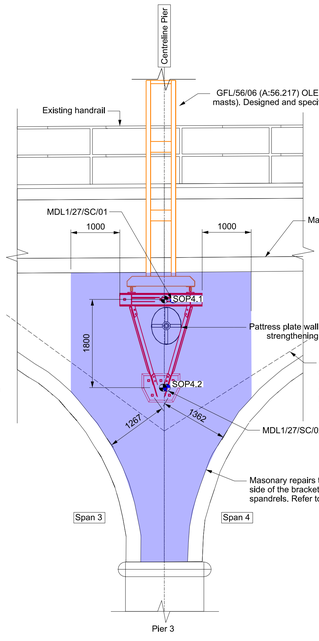
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Drawing Number
151667-TSA-41-MDL1-DRG-C-ST-042707 P03

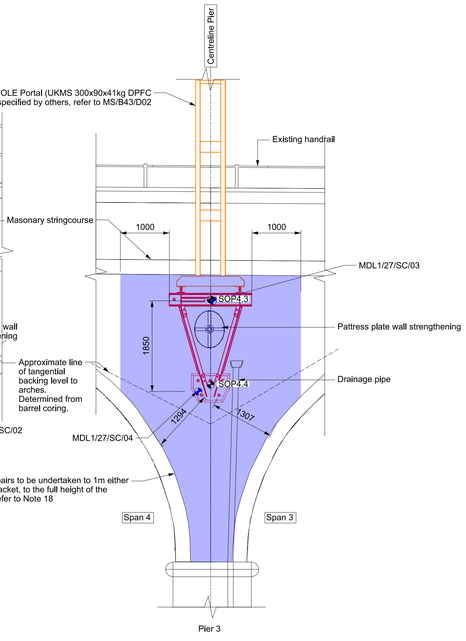


I 042705 East 'Up' Elevation Pier 7
Scale 1:50

J 042705 West 'Down' Elevation Pier 7
Scale 1:50



K 042705 East 'Up' Elevation Pier 3
Scale 1:50



L 042705 West 'Down' Elevation Pier 3
Scale 1:50

Structural Core Information

Pier	Up Side			
	Top Core	Depth	Bottom Core	Depth
3	MDL1/27/SC/01	1.16m	MDL1/27/SC/02	2.65m
7	MDL1/27/SC/05	1.00m	MDL1/27/SC/06	3.50m
	Down Side			
	Top Core	Depth	Bottom Core	Depth
3	MDL1/27/SC/03	1.16m	MDL1/27/SC/04	1.95m
7	MDL1/27/SC/07	1.27m	MDL1/27/SC/08	3.50m

Key -

Location of Ø75mm Structural Cores

Sandstone Masonary:

Made Ground:

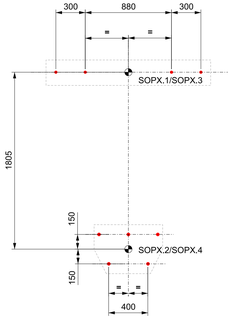
Coarse Granuar Fill:

Concrete:

Ballast:

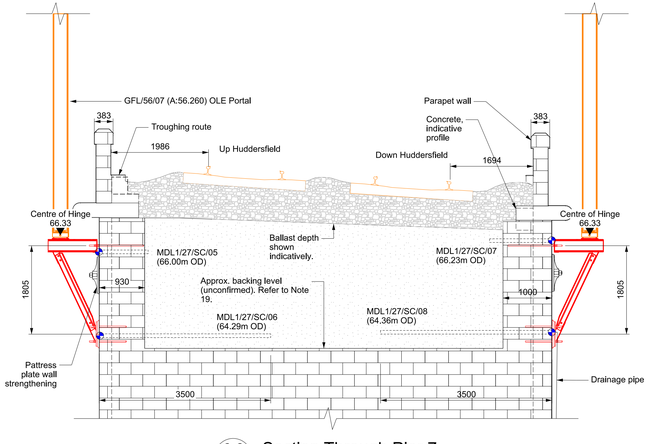
Legend

- Proposed
- To be removed
- Existing
- Ordnance survey data
- Works by others

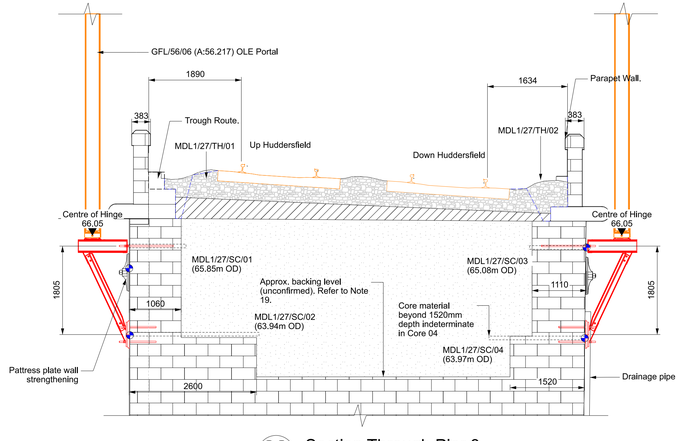


- 042705 Anchor Setting Out Template
Scale 1:25

Mast	SOP	Easting	Northing	Level
GFL/56/09	1.1	244639.274	430935.649	66.790
	1.2	244639.274	430935.649	64.985
	1.3	244630.002	430936.558	66.785
	1.4	244629.988	430936.560	64.980
GFL/56/08	2.1	244634.321	430893.346	66.382
	2.2	244634.321	430893.346	64.577
	2.3	244625.078	430894.684	66.382
	2.4	244625.078	430894.684	64.577
GFL/56/07	3.1	244626.927	430851.042	66.126
	3.2	244626.927	430851.042	64.321
	3.3	244617.771	430852.834	66.126
	3.4	244617.771	430852.834	64.321
GFL/56/06	4.1	244617.809	430809.001	65.848
	4.2	244617.809	430809.001	64.043
	4.3	244608.683	430811.251	65.848
	4.4	244608.683	430811.251	64.043



C-C 042705 Section Through Pier 7
Scale 1:50



D-D 042705 Section Through Pier 3
Scale 1:50

Legend/Notes

1. All dimensions are in millimetres unless noted otherwise.
2. Do not scale from this drawing.
3. This drawing is to be printed in colour.
4. This drawing refers only to the Structures scope OLE bracketry works only
5. The CDM Hazard Record is to be read in conjunction with this drawing: 151667-TSA-41-MDL1-RSA-W-SS-000001
6. All works to be undertaken in accordance with Network Rail standards NR/L2/CIV/140 Issue 12: Specifying Civil Engineering works and NR/L2/CIV/044 Issue 4.
7. Track monitoring shall be carried out in accordance with NR/L2/CIV/177, Issue 2, Monitoring Track over or Adjacent to Building and Civil Engineering Works.
8. Requirement for Anti-bird spikes in the temporary condition during construction to be reviewed by construction team.
9. This drawing is based on OS Tiles, Network Rail record information and supplemented by the following Survey information:
   - MDL1/27 3D Wire Frame: 151667-TSA-W4-MDL1-DM3-X-MF-501001
   - MDL1/27 3D Wire Frame: 151667-TSA-W4-MDL1-DM3-X-MF-502001
   - MDL1/27 3D Wire Frame: 151667-TSA-W4-MDL1-DM3-X-MF-701355
   - MDL1/27 Point Cloud: 151667-TSA-W4-MDL1-DM3-X-MF-502501
   - MDL1/27 Coring + Trial Pits: 151667-TSA-W4-MDL1-DM3-X-MF-702014
   - MDL1/27 Trial Pit Logs: 151667-TSA-W4-MDL1-DM3-X-MF-701579
   - MDL1/27 Trial Pit Logs: 151667-TSA-W4-MDL1-DM3-X-MF-702815
10. Dimensions shown of historic Structures are taken from varying Survey sources. As such all dimensions are to be verified by the contractor prior to commencing construction works.
11. Walls to be scabbled to reduce surface profile variation prior to settling out and drilling of anchors for fitment and constructibility purposes.
12. Alternate UP/DN brackets are to be installed 'square' to one another, or as far as reasonable practicable for fitment requirements with limited skew permissible in hinge base fixtures and OLE structures.
13. OLE position based on the latest OLE deliverables:
   - Layout Plan: 151667-TSA-W4-MDL1-DRG-R-OH-110301
   - GFL/56/10 Cross Section: 151667-TSA-W4-MDL1-DRG-R-OH-110345
   - GFL/56/11 Cross Section: 151667-TSA-W4-MDL1-DRG-R-OH-110346
14. Construction tolerance for bracket position is +/- 20mm globally.
15. Setting Out Point (SOP) coordinates are at bolt/anchor fixing centres upon the masonry surface prior to scabbling (using point cloud data). The contractor is to verify fixing locations using total stations and templating methods. Clients Representative / Designer to be informed of discrepancies.
16. All works relate to fixing OLE supporting structures to Network Rail owned and maintained assets. Asset is Grade II listed. Works overhang third-party land. Negotiation/approval of access and site works are therefore required.
17. All dimensions relevant to position of the running rail edge (offsets and drops/heights) have been calculated using proposed TRU alignments. unusual site specific risks that are obvious to a competent contractor.
18. Standard NR Specification masonry repairs shall be completed to spandrel elevations prior to installation of OLE in accordance with NR/CIV/SD/101 and the associated technical user manual. Use of standard repairs has been approved based on the following:
   - MDL1/27 Detailed Exam, ID: 12068971 (Dated 09/04/2021)
   - MDL1/27 Level 1 Assessment Report - Final (Dated 2019)
   - MDL1/27 Sensitivity Assessment Report - A02 (Dated 25/01/2022)
19. AECOM Drawing COCAFALNEY4-A114-14 (Version P0) containing barrel cores used to verify presence of backing and overlaid waterproofing.

Rev	Date	Description of Revisions	Drawn	Chkd	Appr
P01	19/10/21	F001 Submission	DH	NH	DR
P02	03/11/21	First Issue	PA	NH	DR
A01	25/04/22	First Issue	PA	NH	DR
P03	29/04/24	For IDC/R	LP	JI	NW

Status: Fit for Information
Suitability: S2

Authorised | Signed | Date

Contractor(s): TRU West Alliance

Location: THORNHILL LNW JN - HOLBECK EAST JN (MIRFIELD - LEEDS)

Type: CAD Drawing
Sub-type: Section
Role: Civil Engineer
Sub-Role: Structures and Buildings
Zone: Batley to Morley Tunnel - Area B
Phasing: Proposed
Project Stage: GRIP 4

Project: Transpennine Route Upgrade

Contract No.: 151667

Contract Title: TRU - West of Leeds

Drawing Title:
W4 - Area B
MDL1/27 - Union Mill (Batley) Viaduct - OLE Brackets
Proposed Sections Sheet 2 of 2

Designed	Y.Vorajee	Signed	Date 29/04/24
Drawn	L.Peters	Signed Electronically Signed	Date 29/04/24
Checked	J.Ingram	Signed Electronically Signed	Date 29/04/24
Approved	N.Wightman	Signed Electronically Signed	Date 29/04/24

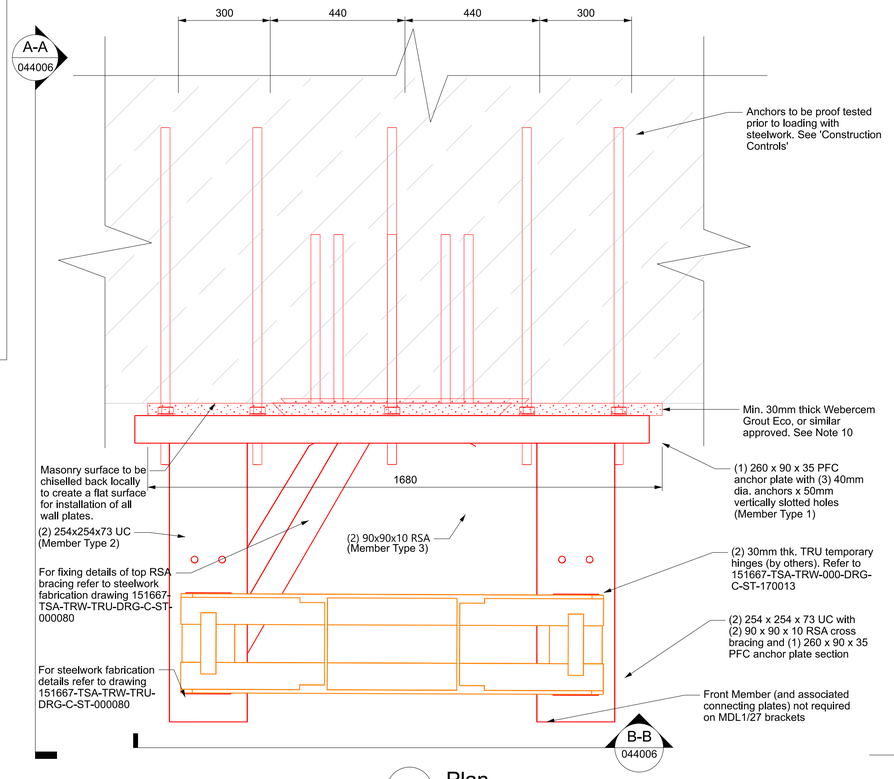
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Alternative Reference

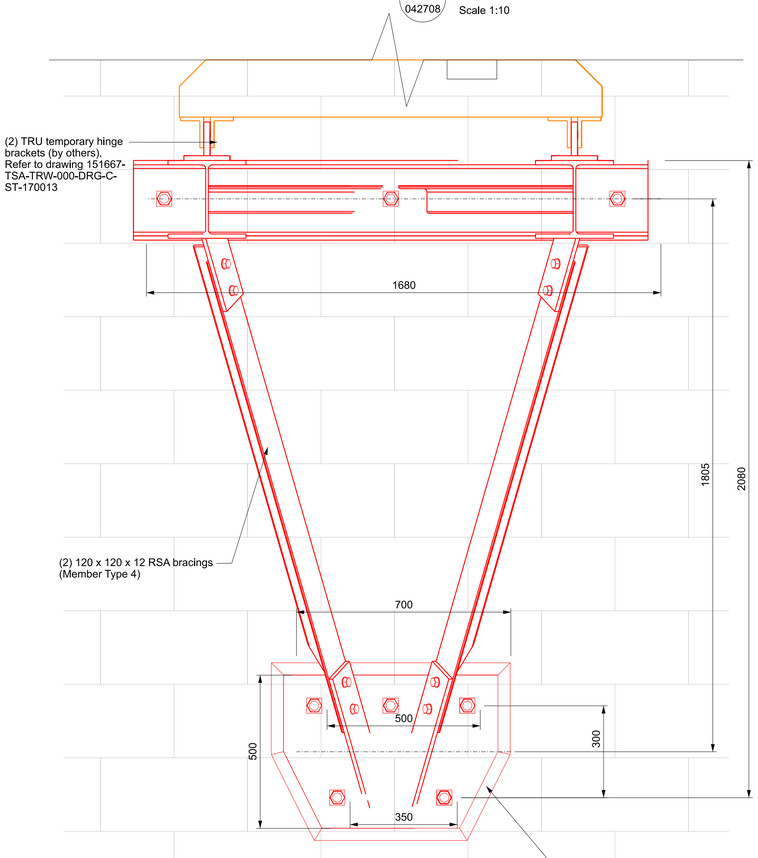
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Drawing Number: 151667-TSA-41-MDL1-DRG-C-ST-042707
Revision: P03

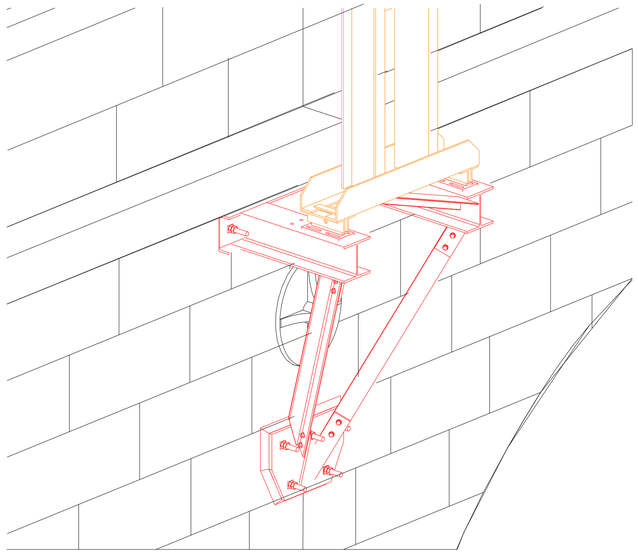
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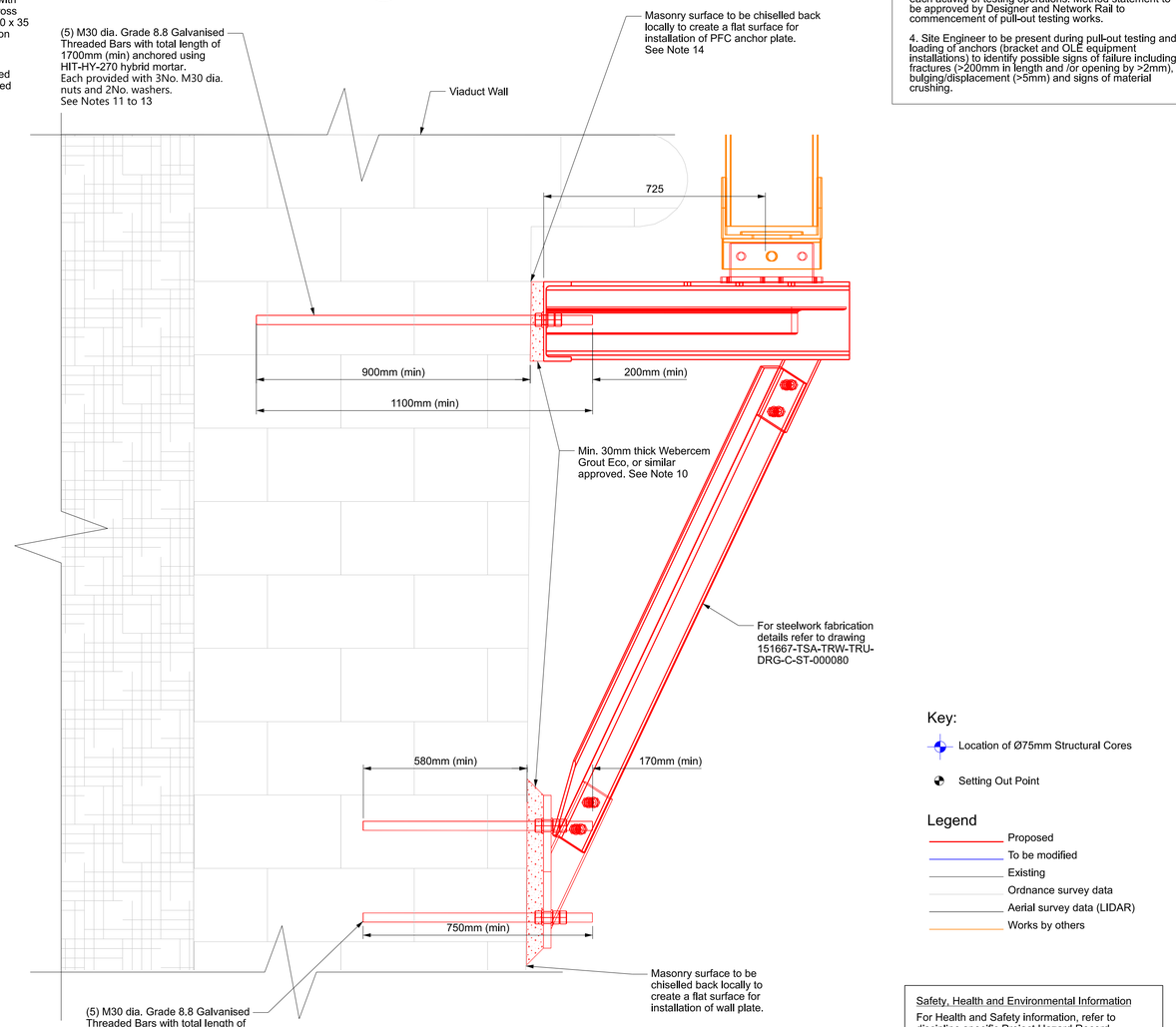
- / 042708 **Plan**
Scale 1:10



B-B / 042708 **Elevation**
Scale 1:10



- / 042708 **3D View**
NTS



A-A / 042708 **Section A-A**
Scale 1:10

Key:

- Location of Ø75mm Structural Cores
- Setting Out Point

Legend

- Proposed
- To be modified
- Existing
- Ordnance survey data
- Aerial survey data (LIDAR)
- Works by others

Safety, Health and Environmental Information

For Health and Safety information, refer to discipline specific Project Hazard Record.

0 200 400 600 800 1000mm
SCALE 1:10

Construction Sequence

1.Install Working Platform/ temporary works as necessary.

2. Undertake repairs to masonry and localised breakout of masonry surface as required to facilitate installation. Mortar to achieve >60% of final strength before installation of brackets. 24hours minimum recommended dependant on final product sopec/mix of mortar used.

3. Drill anchor holes and install resin anchors for attachment of drilling rig (incl. curing time as per manufacturers guidelines).

4. Attach rig and undertake drilling to required depth.

5. Insert anchors as per design specification.

6. Perform anchor proof testing - refer to 'construction controls' section for further details.

7. Top frame of bracket, consisting of PFC base plate (Member Type 1), main UC beams (Member Type 2) and bracings (Member Type 3) to be bolted onto wall. Grouting to be added behind wall plates.

8. Bottom frame, consisting of plate and angle supports (Member Type 4) to be installed. Angle supports (Member Type 4) to be bolted to top frame of bracket.

9.OLE masts to be lifted into position, without top boom of portal. Base of OLE mast to be bolted to top of bracket. All three holes to be bolted in temporary condition to form moment connection (see guidance on drawing 151667-TSA-TRW-000-DRG-C-ST-170013).

10. Undertake grouting between bracket and wall (incl. curing time as per manufacturer's guidelines).

11. Top boom of portal to be installed on OLE mast and secured.

12. Temporary bolts at OLE base to be removed to form hinge connection (see guidance on drawing 151667-TSA-TRW-000-DRG-C-ST-170013).

13. All temporary works to be removed and site made good

Construction Controls

1. Proof testing of anchors to take place in accordance with CFA document 'GN Procedure for site testing construction fixings' - 2012. Loading to be completed in 3 No. increments - TBC at detailed design.

2.Testing to be undertaken to 2no. top (tensile) bracket anchors as a minimum. Remaining to be tested if failure occurs.

3. Installer to provide method statement fully detailing each activity of testing operations. Method statement to be approved by Designer and Network Rail to commencement of pull-out testing works.

4. Site Engineer to be present during pull-out testing and loading of anchors (bracket and OLE equipment installations) to identify possible signs of failure including: fractures (>200mm in length and /or opening by >2mm), bulging/displacement (>5mm) and signs of material crushing.

Legend/Notes

1. All dimensions are in millimetres unless stated otherwise.

2. Do not scale from this drawing.

3. This drawing is to be printed in colour.

4. Construction tolerance is +/- 10mm

5. For steelwork fabrication details refer to drawing 151667-TSA-TRW-TRU-DRG-C-ST-000080

6. Front PFC member and welded fixing plates of standard arrangement not required for MDL1/27 brackets.

Construction Phasing and Monitoring

7. Repairs required should be reviewed on site by qualified STE4 examiner.

8. Existing Structure to undergo Visual Watching Brief during drilling of anchors and installation of brackets. Refer to CDM Hazard Register (151667-TSA-W4-MDL1-REG-W-ST-000001) and 'Construction Controls' identified within this drawing for additional details.

9. All main steelwork to be Grade S355 J2 unless stated otherwise in accordance with BS EN 10025-2. All steelwork (incl. fixings) to be hot-dip galvanised to ZN3 (140µm) in accordance with BS EN ISO 1461 and NR/L3/CIV/040.

Grouting

10. 30mm thick (min) to 50mm thick (max) Webercem Grout Eco (or similar approved) non-shrink cementitious grout to be placed between the uneven surface provided by non-coordinated size masonry block work construction and bracket steelwork. Grout to be suitable for void filling between 25 and 100mm, with minimum compressive strength 40N/mm²and compliance to BS EN 1504-3 and BS EN 1504-6.

Anchors

11. Masonry anchors to be M30 dia. Grade 8.8 Galvanised threaded bars with HIT-HY-270 injectable hybrid mortar (or similar approved such as EPCON C8 Resin or Fosroc Conbextra HF Plus) in accordance with MS/C65/J55 into 40mm dia. oversized holes.

12. Masonry anchors are to be provided with (2) Grade A4 nuts (DIN 314) with 1719Nm (max) tightening torque and (2) compatible oversized M30 washers (DIN ISO 7093 - 92mm O.D) in accordance with BS 4320:1968. Top anchors to be embedded 1500mm and project 200mm, bottom anchors to be embedded 580mm minimum and project 165mm minimum.

13. All anchors should be installed in accordance with manufacturer's guidance. Holes to be drilled and air cleaned and injected with resin (Hilti HIT-HY 270 or similar approved). Resin to be set to manufacturer's specification, ensuring that specified strength has been sufficiently developed.

14. Standard NR Specification masonry repairs shall be completed to spandrel elevations prior to installation of OLE in accordance with NR/CIV/SD/101 and the associated technical user manual. Use of standard repairs has been approved based on the following:
- MDL1/27 Detailed Exam, ID: 12068971 (Dated 09/04/2021)
- MDL1/27 Level 1 Assessment Report - Final (Dated 2019)
- MDL1/27 Sensitivity Assessment Report - A02 (Dated 25/01/2022)

15. Proprietary nut protection caps to be used on bolted connections of steel work to improve long-term protection of hex-heads.

Rev	Date	Description of Revisions	Drawn	Chkd	Appr
P01	29/04/24	For IDC/R	LP	JI	NW

Status: Fit for Information
Suitability: S2

NetworkRail

Authorised		Signed	Date

Contractor(s): TRU West Alliance

Location	THORNHILL LNW JN - HOLBECK EAST JN (MIRFIELD - LEEDS)		
Type	CAD Drawing	Sub-type	Detail
Role	Civil Engineer	Sub-Role	Structures and Buildings
Zone	Batley to Morley Tunnel - Area B		
Phasing	Proposed	Project Stage	GRIP 5

Project: Transpennine Route Upgrade

Contract No.: 151667

Contract Title: TRU - West of Leeds

Drawing Title:
W4 - Area B
MDL1/27 - Union Mill (Batley)
Viaduct - OLE Brackets
Anchorage Details

Designed	Y.Vorajee	Signed	Date 29/04/24
Drawn	L.Peters	Signed Electronically Signed	Date 29/04/24
Checked	J.Ingram	Signed Electronically Signed	Date 29/04/24
Approved	N.Wightman	Signed Electronically Signed	Date 29/04/24

Scale(s)	As Shown	ELR & Mileage	34.1606 to 0
Alternative Reference		Sheet	1 of 1
Drawing Number	151667-TSA-41-MDL1-DRG-C-ST-042708	Revision	P01

Sheet Size A1 594 x 841

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