CampbellReith
consulting engineers

56 Hawtrey Road
London NW3 3SS

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12066-15
Rev: F1

November 2015

Campbell Reith Hill LLP
Friars Bridge Court
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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	July 2015	Comment	EMBts12066-15-300715-D1.doc	E Brown	E Brown	E Brown
F1	November 2015	For planning	EMBts12066-15-251115-56 Hawtry Road-F1.doc	E Brown	E Brown	E Brown

Document Details

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Path	EMBts12066-15-251115-56 Hawtry Road-F1.doc
Author	E M Brown, BSc MSc CGeol FGS
Project Partner	E M Brown, BSc MSc CGeol FGS
Project Number	12066-15
Project Name	56 Hawtrey Road, London NW3 3SS
Planning Reference	2015/2665/P

Contents

Appendices

1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by London Borough of Camden (LBC) to carry out an audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 56 Hawtrey Road, London NW3 3SS (planning reference 2015/2665/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. The Audit reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development in accordance with LBC's policies and technical procedures.

1.3. CampbellReith was able to access LBC's Planning Portal and gain access to the latest revision of submitted documentation and review it against an agreed audit check list.

1.4. The BIA has confirmed that the proposed basement will be located partly within the London Clay and that the surrounding slopes are stable.

1.5. Groundwater detected during monitoring may represent a perched groundwater table and this should be confirmed by further monitoring. Suitable mitigation measures should be agreed with the party wall surveyor to be implemented if groundwater ingress is encountered. Further investigation would be prudent to inform the design.

1.6. The proposed basement will be excavated and constructed utilising established techniques. There is a presumption of an absence of neighbouring basements, however, in the absence of a risk to groundwater flow, this is a conservative assumption.

1.7. It is accepted that the risk of surface water flooding is likely to be low.

1.8. Subsequent to the issue of the initial audit report, additional information was provided by the Engineer (refer to Appendix 3). This information confirms that the bearing stratum is adequate for the proposed foundations and that ground movements resulting from basement construction should be small. Assuming there is good control of workmanship and the neighbouring structures are in sound condition, it is accepted that any damage should not exceed "slight". A monitoring regime has been proposed which should be agreed with the party wall surveyor.

1.9. It is accepted that the BIA has adequately identified the potential impacts from basement construction and proposes sufficient mitigation.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 16th June 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 56 Hawtrey Road, Camden Reference 2015/2665/P.

2.2. The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development.

2.3. A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water

2.4. The BIA should demonstrate that schemes:

a) maintain the structural stability of the building and neighbouring properties;

b) avoid adversely affecting drainage and run off or causing other damage to the water environment; and,

c) avoid cumulative impacts upon structural stability or the water environment in the local area.

and evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

2.5. The planning proposal is for a 3.5m deep basement beneath a terraced building for domestic use. LBC's Audit Instruction described the planning proposal as the "*Excavation of single storey rear basement extension. Revised rooftop storage and ground floor rear doors following 2014/7964/P (Erection of single storey rear extension and roof extension, replacement of garage door with window, replacement of front door and replacement of rear 1st floor windows with French doors) granted 03/02/2015 and replacement of first and second floor windows at front and rear 'like for like'*"

The Audit Instruction also confirmed that the basement proposals do not involve a listed building, nor does the site neighbour listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 13th July 2015 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment by JMS Engineers
- Basement Impact Assessment (Groundwater only) by ESI
- Construction Management Plan
- Drawings;

  PO1 no rev existing general arrangement plans

  P04 no rev general arrangement plans

  PO5 no rev general arrangement

  PO6 no rev general arrangement sections

  P04 rev A proposed basement-ground

  PO5 rev A proposed general arrangement elevations

  PO6 rev A proposed general arrangement sections

2.7. In response to a number of queries raised by the audit, additional information was received between 20 October and 23 November 2015. The pertinent information is listed below and is presented in Appendix 3.

- Response to audit queries – 20.10.15
- Monitoring regime – 20.10.15
- Audit response calculations - 17.11.15
- Revised calculations – 23.11.15.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	The author of the JMS BIA is a chartered structural engineer. The checker of the ESI BIA (Groundwater only) is a chartered geologist.
Is data required by Cl.233 of the GSD presented?	Yes	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	BIA and drawings.
Are suitable plan/maps included?	Yes	BIA and drawings.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 4.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 4, and BIA (Groundwater only) - Section 2.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 4. There is a statement that there is no risk of flooding but no discussion of any previous historical flooding in the area. However, the list of streets at risk of surface water flooding in CPG4 does not include Hawtrey Road.
Is a conceptual model presented?	Yes	Only for groundwater; BIA (Groundwater only) - Section 4.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 4.
Hydrogeology Scoping Provided?	Yes	BIA – groundwater only Section 3.

Item	Yes/No/NA	Comment
Is scoping consistent with screening outcome?		
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	BIA Section 3.
Is monitoring data presented?	Yes	Groundwater monitoring indicated groundwater at 1.65m depth.
Is the ground investigation informed by a desk study?	Yes	BIA Section 1.
Has a site walkover been undertaken?	No	No evidence of the authors of the BIA having visited the site.
Is the presence/absence of adjacent or nearby basements confirmed?	No	Basement presumed absent – BIA Section 6.2.
Is a geotechnical interpretation presented?	No	Supplementary information states that vertical loadings are unchanged and soil becomes stiffer with depth.
Does the geotechnical interpretation include information on retaining wall design?	NA	
Are reports on other investigations required by screening and scoping presented?	Yes	BIA – groundwater only.
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	No	
Is an Impact Assessment provided?	Yes	BIA Section 7. A statement is made that the use of temporary and permanent propping will limit deflections to less than 5mm.
Are estimates of ground movement and structural impact presented?	No	BIA Section 7 states that damage will be "slight".

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	BIA Section 7 indicates that temporary and permanent propping will be provided. Construction Management Plan.
Has the need for monitoring during construction been considered?	Yes	Indicative monitoring regime provided as supplementary information.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Indicative monitoring regime provided as supplementary information.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure been maintained?	Yes	Supplementary information provided to confirm that anticipated ground movements are small.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	
Are non-technical summaries provided?	No	Reports are written clearly and in an understandable way.

4.0 DISCUSSION

4.1. The BIA has been carried out by an established firm of consulting engineers, JMS Engineers, supplemented by ESI. The authors have suitable qualifications.

4.2. The excavation and construction method of the proposed basement is not described in detail. The Construction Management Plan indicates that the existing foundations will be underpinned in phased and sequenced panels. Excavation may be using a conveyor. With suitable controls this is an acceptable methodology using established techniques.

4.3. It is accepted that the basement will be within London Clay.

4.4. We accept that the groundwater detected during monitoring may represent a perched groundwater table, and be of limited volume. Suitable mitigation measures should be agreed with the party wall surveyor to be implemented if groundwater ingress is encountered. Further investigation would be prudent to inform the design.

4.5. The BIA has shown that the surrounding slopes to the development are stable. There is a tree close to the basement and the impact on the tree from the basement is not discussed.

4.6. The BIA states that there is a low risk of surface water flooding. A check of the streets listed in CPG4 that have been affected by historical flooding does not include Hawtrey Road. The flooding risk is accepted as being low.

4.7. The BIA does not include a geotechnical interpretative report nor any discussion of the adequacy of the founding stratum for the proposed underpinning. In supplementary information, it is stated by the Engineer that the structural loads are unaltered and the ground investigation shows the ground to become stiffer with depth. This is accepted.

4.8. There is a presumption of an absence of neighbouring basements, however, in the absence of a risk to groundwater flow, this is a conservative assumption.

4.9. The original BIA did not contain a Ground Movement and detailed Building Damage Assessment, nor any calculations to predict the vertical and horizontal movements and strains associated with excavation, retaining wall construction, excavation, re-loading and the long term dissipation of excess ground water pressures. These calculations were required to be submitted. This information was subsequently provided (refer to Appendix 3). It is accepted that on the assumption of good control of workmanship, any damage to the neighbouring properties is likely to be no worse than slight, provided they are in sound condition.

4.10. An indicative monitoring regime was provided after the submission of the original BIA. The monitoring regime and trigger levels should be agreed with the party wall surveyor.

5.0 CONCLUSIONS

5.1. The BIA authors have suitable qualifications.

5.2. The excavation and construction method of the proposed basement is not described in detail. The Construction Management Plan indicates that the existing foundations will be underpinned in phased and sequenced panels. Excavation may be using a conveyor. With suitable controls this is an acceptable methodology using established techniques.

5.3. It is accepted that the basement will be within London Clay.

5.4. Further investigation should be carried out to confirm the groundwater regime and suitable mitigation measures should be agreed with the party wall surveyor to be implemented if groundwater ingress is encountered.

5.5. There is a tree close to the basement and the impact on the tree from the basement is not discussed. Any potential impacts should be agreed with the party wall surveyor.

5.6. The flooding risk is accepted as being low.

5.7. There is a presumption of an absence of neighbouring basements. In the absence of a risk to groundwater flow, this is a conservative assumption.

5.8. It has been confirmed that the bearing stratum has an adequate design resistance for the proposed underpinning.

5.9. Subsequent to the issue of the BIA, structural calculations were provided which included an estimate of ground movements. No damage assessment was provided, however it was stated that any damage would be no worse than "slight". On the basis of the predicted movements, this is accepted.

5.10. A movement monitoring regime on the adjacent properties during construction has been proposed. This should be agreed with the party wall surveyor.

5.11. It is accepted that the BIA has adequately identified the potential impacts from basement construction and proposes sufficient mitigation.

Appendix 1: Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
ADL Planning Ltd	29 Highmarsh Crescent, Newton-le-Willows, Merseyside, WA12 9WE	28/05/15	Concerned about damage to neighbouring building. Concerned about effect on groundwater.	See Sections 5.7 – 5.10 See Section 4.4 and 5.4

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Subterranean water	A possible perched water table was recorded.	Further monitoring required prior to construction to allow mitigation measures to be agreed.	N/A
2	Stability	No geotechnical interpretation provided.	Adequacy of bearing stratum to be confirmed in updated BIA.	20.10.2015
3	Stability	Calculations are required to be submitted to justify the "slight" building damage assessment	Updated calculations received.	23.11.2015
4	Stability	Requirement for monitoring regime not determined.	Monitoring regime proposed.	20.10.2015

Appendix 3: Supplementary Supporting Documents

SubStructural Limited
Suite LP202292
145-157 St John Street
London EC1V 4PW
T: 020 7608 5740
www.substructual.co.uk

20.10.2015

Planning Dept.
London Borough of Camden
5 Pancras Square
London
N1C 4AG

For the attention of Tessa Craig

Re: Proposed Works at 56 Hawtry Road, London NW3 3SS

Dear Tessa,

With regard to the above project and the queries raised by the audit engineer we would respond the points raised as follows:

1 It is proposed to create a basement beneath the existing building utilising, in part, the Party Walls. No additional vertical load of significance is being applied to these Party Walls and as such no increased bearing pressure will arise and no settlement/consolidation of the underlying soils is expected.

2 The transfer of the vertical loads will occur by the underpinning of the existing footing to a depth appropriate to reflect the proposed basement excavation. This load will be re-applied to the soils by a mass concrete foundation beneath the basement (see attached sketch)

3 The introduction of the reinforced slab at the basement floor level is twofold:
   a. It is utilised to distribute the lateral loads applied to the basement wall from the retained material
   b. It is utilised to restrict uplift from potential clay heave (nominal) and water pressure

4 As there is no proposed increase in loading and lateral loads are addressed by a suitably stiff basement wall, we anticipate that movement to adjacent/Party walls are negligible. Calculations have been provided in respect of lateral movement to the basement walls. As vertical loading remains the same and the ground becomes 'stiffer' with depth vertical settlement is, for all intents and purpose, zero

SubStructural Limited
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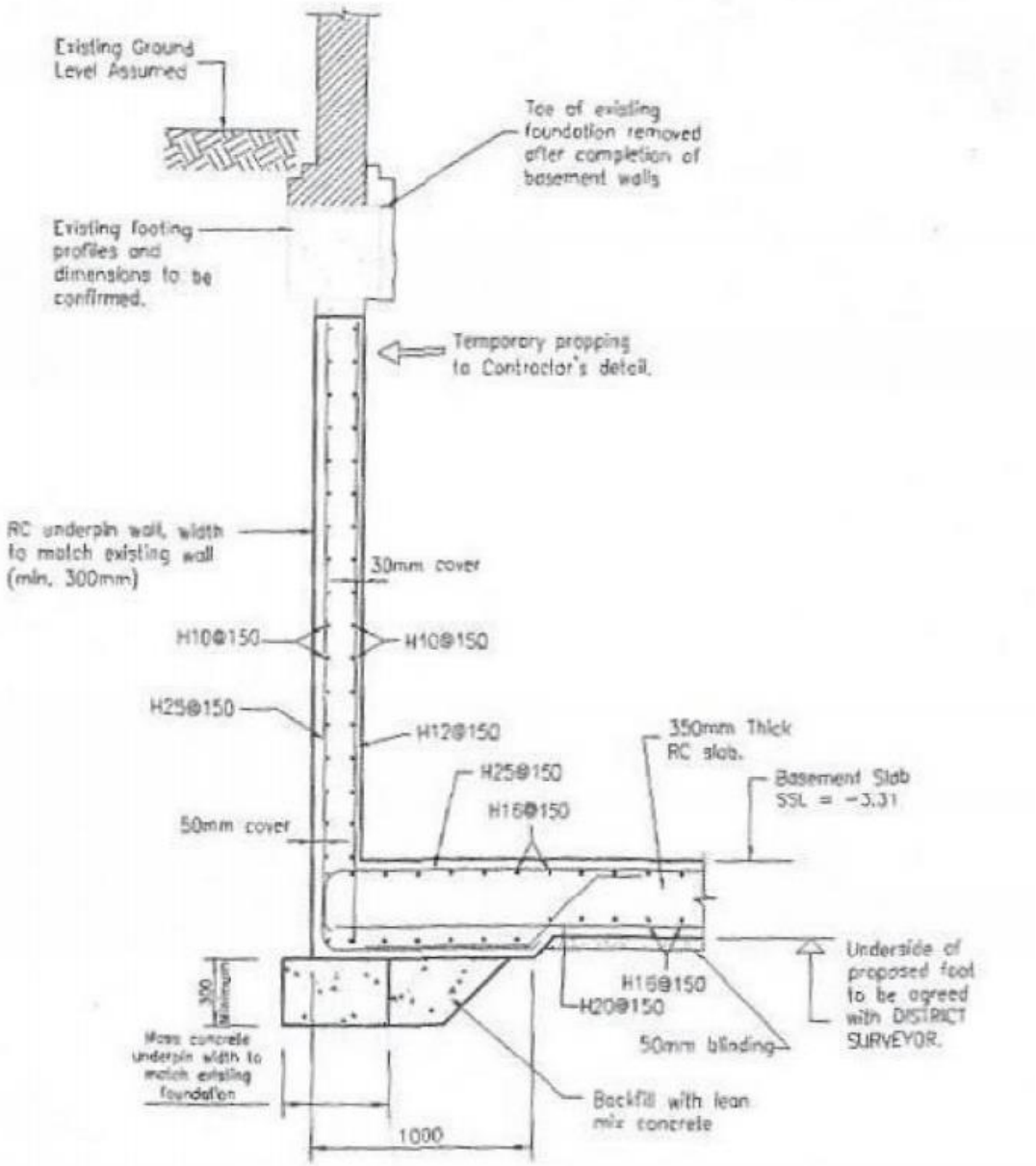
We trust the foregoing clarifies the proposal:



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Yours sincerely

For and behalf of SubStructural Ltd

Daniel Staines

BEng (Hons) MIStructE CEng PgDip Const. Management

SubStructural Limited
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Monitoring Regime

At

56 Hawtrey Road, London NW3 3SS

For

Proposed Basement & Internal Alterations

Client: Mr & Mrs Koffel

Architect: Anna Williamson Architects

October 2015

SubStructural Limited
Suite LP202292
145-157 St John Street
London EC1V 4PW
T: 020 7608 5740
www.substructual.co.uk

To address concerns regarding movement during the construction process, we suggest a monitoring regime undertaken by a Chartered Building Surveyor and is instigated as follows:

1. Surveyor to visit the site to inspect the property and those adjacent to it. A number of monitoring points could then be installed to the corners and front, side and rear elevations of the property. In addition, and providing the adjoining property owner is in agreement similar points could be fixed to the adjacent property too.

2. An initial set of readings will need to be taken prior to commencement of construction. Timing of subsequent visits will be subject to the main contractors program of works on site but a bi-weekly basis should be sufficient as below ground construction takes place.

3. The surveyors will provide a plan showing numbered positions of the monitoring targets and a spreadsheet showing any discrepancies between the previous visit and the original visit. It's anticipated that any monitoring regime is expected to last for the duration of the basement structural works.

4. Trigger limits of 0-2mm (Green), 2-5mm (Amber), and anything above Red. Should Amber limits be reached then the Structural Engineer should be notified and the contractor to proceed with caution. Should Red limits be reached then the Structural Engineer should again be notified and works halted on site until otherwise agreed with the Engineer.

An example of monitoring points that may be used is shown on the following pages

SubStructural Limited
Suite LP202292
145-157 St John Street
London EC1V 4PW
T: 020 7608 5740
www.substructual.co.uk

75 x 75mm Prisim
The prisim is the most accurate and is bolted to the building surface using a 8mm x 80mm expanding bolt. Once removed they leave a drilled hole in the wall

8 x 80mm Fixing Bolt

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www.substructual.co.uk

25 x 25mm Target

These targets stick to the surface, they are slightly less accurate and have a potential to come away from the surface due to weather conditions

Re: FW: 56 Hawtry Road
Liz Brown to: Craig, Tessa 22/10/2015 15:15

Tessa

Thanks for forwarding on the additional information for Hawtry Road. Taking each of the 4 points in Audit Queries 20.10.2015, we would comment as follows:

1. Whilst there are no additional vertical loads, the foundations are deeper and will be stressing soils that were previously below the zone of influence of the foundations. Some settlement might therefore be expected.
2. As above.
3. Accepted.
4. There will be some settlement as noted above, as well as horizontal movements (Substructural say that calculations of horizontal movement have been provided - can these be sent to us?)

With respect to the monitoring plan, the amber trigger level is set at 5mm. At the least, Substructural should demonstrate the Category of damage anticipated with 5mm horizontal and/or vertical movement, or more if that is what is estimated in the calculations.

Regards,

Elizabeth Brown
Partner

CampbellReith
consulting engineers

Friars Bridge Court,
41-45 Blackfriars Road,
London
SE1 8NZ

Tel +44 (0)20 7340 1700
www.campbellreith.com

"Craig, Tessa" Dear Liz, Please find attached additional informat... 20/10/2015 13:36:41

From: "Craig, Tessa" <Tessa.Craig@camden.gov.uk>
To: "lizbrown@campbellreith.com" <lizbrown@campbellreith.com>
Date: 20/10/2015 13:36
Subject: FW: 56 Hawtry Road

Dear Liz,

Please find attached additional information responding to the queries by Campbell Reith for 56 Hawtrey Road (2015/2665/P).

Any questions please let me know.

Regards,

Tessa Craig
Planning Officer

Telephone: 020 7974 6750

From: iancannons@jmsengineers.co.uk [mailto:iancannons@jmsengineers.co.uk] **On Behalf Of** Ian Cannons
Sent: 20 October 2015 12:41
To: Craig, Tessa
Cc: Anna Williamson; Paul Koffel; Christine Athanasius
Subject: Fwd: 56 Hawtry Road

Hi Tessa,

As requested by our client, and as discussed earlier, please see enclosed our response to queries raised by your audit engineer.

Kind regards,

Ian

Ian Cannons

On behalf of
SubStructural Ltd

T 020 7608 5740
M 07720590681

www.substructural.co.uk

---------- Forwarded message ----------
From: **Ian Cannons** <icannons@substructural.co.uk>
Date: 20 October 2015 at 11:38
Subject: 56 Hawtry Road
To: Paul Koffel <paul.koffel@collercapital.com>, Anna Williamson <anna@annawilliamsonarchitects.co.uk>, Christine Athanasius <pandckoffel@btinternet.com>

Hi All,

Please see enclosed to address further queries raised by Camden's Audit Engineer.

We've addressed it to Tessa Craig at LB Camden, please let me know if it needs to be addressed otherwise.

This will need to be forwarded along with the monitoring document as sent to you last week. However please let me know if you'd like us to forward to Tessa direct.

Kind regards,

Ian

Ian Cannons

On behalf of
SubStructural Ltd

T 020 7608 5740
M 07720590681

www.substructural.co.uk

RE: FW: 56 Hawtry Road
Liz Brown to: Craig, Tessa 28/10/2015 14:04

Tessa

I believe that these are the calculations that were submitted before. They do not provide the information noted as being required in our audit report and email of 22 October.

We need a clear statement of predicted horizontal and vertical movements around the excavation and a building damage assessment which are based on accepted methodologies.

Regards,
Elizabeth Brown
Partner

CampbellReith
consulting engineers
Friars Bridge Court,
41-45 Blackfriars Road,
London
SE1 8NZ

Tel +44 (0)20 7340 1700
www.campbellreith.com

"Craig, Tessa" Hi Liz, These are the calculations provided (attac... 23/10/2015 15:56:50

From: "Craig, Tessa" <Tessa.Craig@camden.gov.uk>
To: "LizBrown@campbellreith.com" <LizBrown@campbellreith.com>
Date: 23/10/2015 15:56
Subject: RE: FW: 56 Hawtry Road

Hi Liz,

These are the calculations provided (attached). Please review and let me know whether this clarifies your points or if I need to go back to Substructural for further information.

Regards,

Tessa Craig
Planning Officer

Telephone: 020 7974 6750

You can sign up to our new and improved planning e-alerts to let you know about new planning applications, decisions and appeals.

From: LizBrown@campbellreith.com [mailto:LizBrown@campbellreith.com]
Sent: 22 October 2015 15:15
To: Craig, Tessa
Subject: Re: FW: 56 Hawtry Road

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Regards,

Elizabeth Brown
Partner

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consulting engineers

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Tessa Craig
Planning Officer

Telephone: 020 7974 6750

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Kind regards,

Ian

Ian Cannons

On behalf of
SubStructural Ltd

T 020 7608 5740
M 07720590681

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From: **Ian Cannons** <icannons@substructural.co.uk>
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To: Paul Koffel <paul.koffel@collercapital.com>, Anna Williamson <anna@annawilliamsonarchitects.co.uk>, Christine Athanasius <pandckoffel@btinternet.com>

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We've addressed it to Tessa Craig at LB Camden, please let me know if it needs to be addressed otherwise.

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Kind regards,

Ian

Ian Cannons

On behalf of
SubStructural Ltd

T 020 7608 5740
M 07720590681

www.substructural.co.uk

As this e-mail has been transmitted over a public network the accuracy, completeness and virus status of the transmitted information is not secure a
guaranteed. If verification is required please telephone the sender of the email.

Re: 56 Hawtry Road

Daniel Staines to: LizBrown 17/11/2015 22:44

Cc: Anna Williamson, Ian Cannons, Christine Athanassious, Paul Koffel, Tessa.Craig

Liz,

Following our telephone conversation yesterday please find attached the following documentation:

1 Design commentary outlining the design philosophy for the basement
2 Annotated output sheets from Scia explaining their various aspects
3 A Scia Engineer Fact Sheet which provides additional explanation on how the soil parameters are used by the program.

With regard to the predicted movement, lateral movement of the walls will be negligible and will not have any noticeable effect on either this building or the neighbouring. Vertical displacement due to stressing of the soil is predicted to be at worst 2.4mm as shown on section 7.1 of the results. However this is a transitional displacement not a differential one with 'sloping' more likely to occur as opposed to fracturing. Subsequently, such theoretical displacement will result in minimal damage to the superstructure and is predicted to be CIRIA 580 Category 1 (very slight). As discussed, most movement in houses undergoing underpinning arises from workmanship issues and not ground movement and, although we have specified dry packing and curing times etc., damage to Category 2 (slight) would not be unusual in such works. I would reiterate, however, that 'workmanship movement' cannot be designed/predicted but, from experience, invariably is the prime cause for movement in domestic schemes such as this.

Daniel Staines

On Behalf Of

JMS Consulting Engineers Ltd

View my **Flipbook**

JMS London Ltd : 150 Minories, City of London EC3N 1LS

Tel : 0207 347 5239

JMS East Anglia Ltd : Unit 10 Brightwell Barns, Waldringfield Road, Brightwell, Suffolk IP10 0BJ
Tel : 01473 487250
JMS Midlands Ltd: Victoria Court, Tennant Street, Nuneaton, Warwickshire CV11 4LZ
Tel : 02476 350505
JMS Manchester Ltd : 204 Bolton Road, Worsley, Manchester M28 3BN
Tel : 0161 790 4404
JMS Manchester Ltd (City) : 79 St Thomas St, Manchester, M4 1LQ
Tel : 0161 883 2909
JMS Greece Ltd : 27 Arapitsas Street, Sykies, Thessaloniki 56626 Greece
Tel : 0030 2310 960636

On 16 November 2015 at 11:55, <LizBrown@campbellreith.com> wrote:

Daniel

I understand that you are out of the office this morning.

Thank you for your email of 4 November which suggests that you may not have seen my email of 30 October. I have repeated the text of that email below and annotated it to respond to your latest communication and try to make matters clearer. Section 6 of the Terms of Reference for BIA audits (on Camden's website) may also help explain what we are looking for, together with reference back to our original audit report.

Tessa

Thanks for your email.

The attached information does not really take us any further forward. Whilst it provides an estimate of horizontal movements, it does not address queries 2 and 3 in our audit report.

There is no geotechnical assessment of the design resistance of the soil in relation to the proposed loads. A commentary is required alongside the SCIA output to state assumptions with respect to live and dead loads, surcharges, groundwater etc. Please ask the engineer to refer back to our audit report, in particular paragraph 4.9. **For example, what are C1 and C2 in Section 3.3? What is sigma - is it Cu? Where is the justification for the soil parameters used ? A hand mark up of the SCIA output to provide the information requested above is acceptable to confirm the input and provide justification for the assumptions made .**

There is no consideration of ground movements resulting from the underpinning process.

There is no building damage assessment to confirm the predicted category of damage. The monitoring plan allows for up to 5mm of movement to occur before any mitigation measures are put in place. The category of damage which might occur to neighbouring structures should be predicted should that movement occur (vertically and/or horizontally). **Your email of 4 November suggests BRE Classification 1-2 at most. BRE Classification includes cracks up 5mm and is significantly at odds with previous statements . Can you please clearly state predicted ground movements resulting from all phases of construction and provide an assessment of the predicted building damage resulting from such movements . Mitigation measures are required where damage is predicted to exceed Category 1..**

We previously advised an additional fee of £1012.50 to review revised information and update our report (I'm not sure that acceptance of the additional fee was confirmed). Unless we receive a clear response to our queries in the next iteration of information, we shall have to add another few hours, probably around £540.

I hope that clarifies matters. I am in the office all day today should you have any queries.

56 Hawtrey Rd

Christos Papadakis to: LizBrown 23/11/2015 10:10

Cc: pandckoffel, Graham Chapman

History: This message has been forwarded.

1 attachment

L15_022_01_Basement_design.esa

Hi Liz,

We are sending across a model where an additional 50 kN/m2 has been applied under the slab.

Please feel free to give me a call if you wish to discuss further.

Also can you please confirm if you received the monitoring scheme that Christine has forwarded across?

Thank you in advance and I am looking forward to hearing from you.

Kind regards,

Chris Papadakis

On Behalf Of

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JMS Greece Ltd : 27 Arapitsas Street, Sykies, Thessaloniki 56626 Greece

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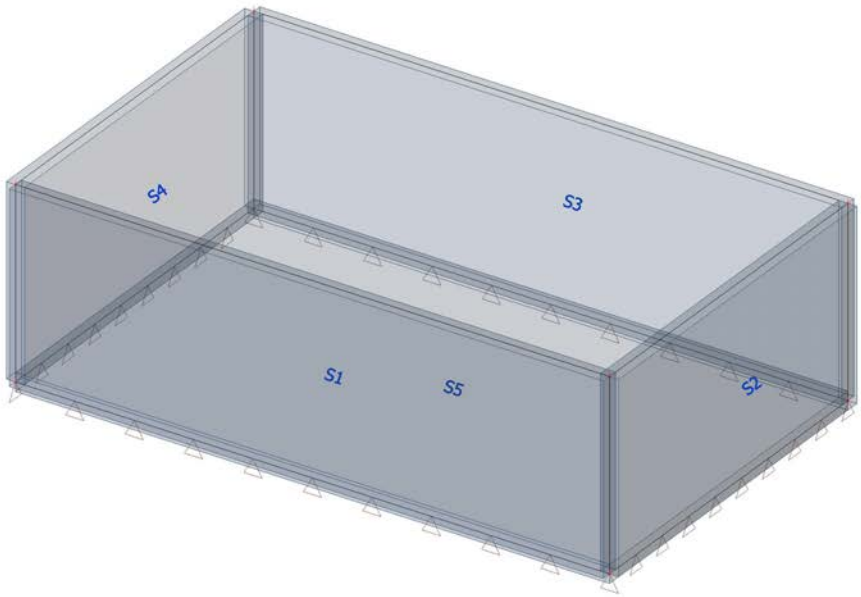
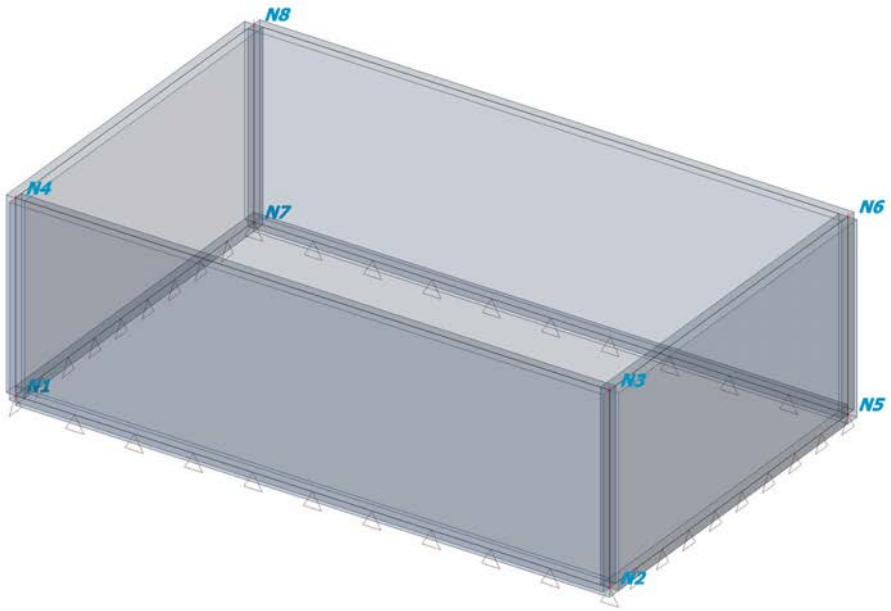
1. Table of contents

2. Model

2.1. 2D Members



2.2. Nodes



3. Libraries

3.1. Setup manager

Combination setup

Category H loading not to be combined with snow or wind	✓

Psi factors

Load	Psi0	Psi1	Psi2
CategoryA	0.7	0.5	0.3
CategoryB	0.7	0.5	0.3
CategoryC	0.7	0.7	0.6
CategoryD	0.7	0.7	0.6
CategoryE	1	0.9	0.8
CategoryF	0.7	0.7	0.6
CategoryG	0.7	0.5	0.3
CategoryH	0	0	0
Snow	0.5	0.2	0
Wind	0.6	0.2	0
Temperature	0.6	0.5	0

Load combination factors

Permanent action - unfavorable	1.35
Permanent action - favorable	1.00
Leading variable action	1.50
Accompanying variable action	1.50
Reduction factor ksi	0.85
Permanent action - unfavorable	1.00
Permanent action - favorable	1.00
Leading variable action	1.30
Accompanying variable action	1.30

Road bridges

gr1b not to be combined with other non-traffic loads	✓
Snow or wind load not to be combined with gr2	✓
Snow or wind load not to be combined with gr3	✓
Snow or wind load not to be combined with gr4	✓
Snow not to be combined with gr1a and gr1b	✓
Wind loads not to be combined with Thermal loads	✓
Snow loads and wind loads not to be combined with construction activity	✓

Road bridges

Load	Psi0	Psi1	Psi2
Traffic - gr1a - TS	0.75	0.75	0
Traffic - gr1a - UDL	0.4	0.4	0
Traffic - gr1a - Pedestr. + cycle track	0.4	0.4	0
Traffic - gr1b - Single axle	0	0.75	0
Traffic - gr2 - Horizontal forces	0	0	0
Traffic - gr3 - Pedestrian loads	0	0.4	0
Traffic - gr4 - Crowd loading	0	0	0
Traffic - gr5 - Special vehicles	0	0	0
Wind forces - FWk - Persistent	0.6	0.2	0
Wind forces - FWk - Execution	0.8	0	0
Wind forces - F*W - Design	1	0	0
Thermal actions - Tk	0.6	0.6	0.5
Snow loads - QSn,k - Execution	0.8	0	0
Construction loads - Qc	1	0	1

Road bridges

Permanent action - unfavorable	1.35
Permanent action - favorable	1.00
Leading variable action - unfavorable due to road or pedestrian	1.35
Accompanying variable action - unfavorable due to road or pedestrian	1.35
Leading variable action - all other	1.50
Accompanying variable action - all other	1.50
Reduction factor ksi	0.85

Permanent action - unfavorable	1.00
Permanent action - favorable	1.00
Leading variable action - unfavorable due to road or pedestrian	1.15
Accompanying variable action - unfavorable due to road or pedestrian	1.15
Leading variable action - all other	1.30
Accompanying variable action - all other	1.30

Footbridges

Qfvk not to be combined with other non-traffic loads	✓
Wind loads not to be combined with Thermal loads	✓
Snow loads not to be combined with gr1 and gr2	✓
Snow loads and wind loads not to be combined with construction activity	✓

Footbridges

Load	Psi0	Psi1	Psi2
Traffic - gr1	0.4	0.4	0
Traffic - Qfvk	0	0	0
Traffic - gr2	0	0	0
Wind forces - FWk	0.3	0.2	0
Thermal actions - Tk	0.6	0.6	0.5
Snow loads - QSn,k - Execution	0.8	0	0
Construction loads - Qc	1	0	1

Footbridges

Permanent action - unfavorable	1.35
Permanent action - favorable	1.00
Leading variable action - unfavorable due to road or pedestrian	1.35
Accompanying variable action - unfavorable due to road or pedestrian	1.35
Leading variable action - all other	1.50
Accompanying variable action - all other	1.50
Reduction factor ksi	0.85
Permanent action - unfavorable	1.00
Permanent action - favorable	1.00
Leading variable action - unfavorable due to road or pedestrian	1.15
Accompanying variable action - unfavorable due to road or pedestrian	1.15
Leading variable action - all other	1.30
Accompanying variable action - all other	1.30

Railway bridges

Snow loads not to be taken into account	✓
Wind action not to be combined with gr13 or gr23	✓
Wind action not to be combined with gr16, gr17, gr26, gr27	✓
Snow loads and wind loads not to be combined with constr. activity	✓

Railway bridges

Load	Psi0	Psi1	Psi2
Traffic - gr11 (LM71 + SW/0)	0.8	0.8	0
Traffic - gr12 (LM71 + SW/0)	0.8	0.8	0
Traffic - gr13 (Braking/traction)	0.8	0.8	0
Traffic - gr14 (Centrifugal/nosing)	0.8	0.8	0
Traffic - gr15 (Unloaded train)	0.8	0.8	0
Traffic - gr16 (SW/2)	0.8	0.8	0
Traffic - gr17 (SW/2)	0.8	0.8	0
Traffic - gr21 (LM71 + SW/0)	0.8	0.7	0
Traffic - gr22 (LM71 + SW/0)	0.8	0.7	0
Traffic - gr23 (Braking/traction)	0.8	0.7	0
Traffic - gr24 (Centrifugal/nosing)	0.8	0.7	0
Traffic - gr26 (SW/2)	0.8	0.7	0
Traffic - gr27 (SW2)	0.8	0.7	0
Traffic - gr31 (LM71 + SW/0)	0.8	0.6	0
Aerodynamic effects	0.8	0.5	0
General maintenance loading...	0.8	0.5	0
Wind forces - FWk - Characteristic	0.75	0.5	0
Wind forces - F**W - Design	1	0	0
Thermal actions - Tk	0.6	0.6	0.5

Load	Psi0	Psi1	Psi2
Snow loads - QSn,k - Execution	0.8	0	0
Construction loads - Qc	1	0	1

Railway bridges

Permanent action - unfavorable	1.35
Permanent action - favorable	1.00
Leading variable action - unfavorable due to railway	1.45
Accompanying variable action - unfavorable due to railway	1.45
Leading variable action - unfavorable due to railway gr 16-17	1.20
Accompanying variable action - unfavorable due to railway gr 16-17	1.20
Leading variable action - unfavorable due to railway gr 26-27	1.20
Accompanying variable action - unfavorable due to railway gr 26-27	1.20
Leading variable action - all other	1.50
Accompanying variable action - all other	1.50
Reduction factor ksi	0.85
Permanent action - unfavorable	1.00
Permanent action - favorable	1.00
Leading variable action - unfavorable due to railway	1.25
Accompanying variable action - unfavorable due to railway	1.25
Leading variable action - all other	1.30
Accompanying variable action - all other	1.30

3.2. Materials

Concrete EC2

Name	Type	ρ [kg/m³]	E_{mod} [kPa]	μ	α [m/mK]	$f_{c.k.28}$ [MPa]
C30/37	Concrete	2500.0	3.2800e+07	0.2	0.00	30.00

3.3. Subsoils

Name	C1x [MN/m³]	C1z	C1y [MN/m³]	Stiffness [MN/m³]	C2x [MN/m]	C2y [MN/m]	Sigma oc [kPa]
Sub1	1.5000e+01	Flexible	1.5000e+01	1.5000e+01	1.5000e+01	1.5000e+01	100.0

4. Structure

4.1. Nodes

Name	Coord X [m]	Coord Y [m]	Coord Z [m]
N1	0.000	0.000	0.000
N2	9.800	0.000	0.000
N3	9.800	0.000	3.100

Name	Coord X [m]	Coord Y [m]	Coord Z [m]
N4	0.000	0.000	3.100
N5	9.800	5.900	0.000
N6	9.800	5.900	3.100

Name	Coord X [m]	Coord Y [m]	Coord Z [m]
N7	0.000	5.900	0.000
N8	0.000	5.900	3.100

4.2. 2D members

Name	Layer	Type	Analysis model	Material	Thickness type	Th. [mm]	
S1	Layer1-Basement walls	wall (80)	Standard	C30/37	constant	300	
S2	Layer1-Basement walls	wall (80)	Standard	C30/37	constant	300	
S3	Layer1-Basement walls	wall (80)	Standard	C30/37	constant	300	
S4	Layer1-Basement walls	wall (80)	Standard	C30/37	constant	300	
S5	Layer2-Basement slab	plate (90)	Standard	C30/37	constant	300	

4.3. 2D member supports

Name	Type	Subsoil	2D member
SS1	Individual	Sub1 - 100Kpa	S5

5. Sets

5.1. Load cases

Name	Description	Action type	LoadGroup	Direction	Duration	Master load case
	Spec	Load type				
LC1-Self weigt		Permanent Self weight	LG1	-Z		
LC2-Dead		Permanent Standard	LG1			
LC3-Live		Variable Static	LG2		Short	None
	Standard					
LC4-Water pressure		Permanent Standard	LG1			
LC5-Soil pressure		Permanent Standard	LG1			
LC6-Surcharge		Variable Static	LG2		Short	None
	Standard					

5.2. Load groups

Name	Load	Relation	Type
LG1	Permanent		
LG2	Variable	Standard	Cat A : Domestic

5.3. Combinations

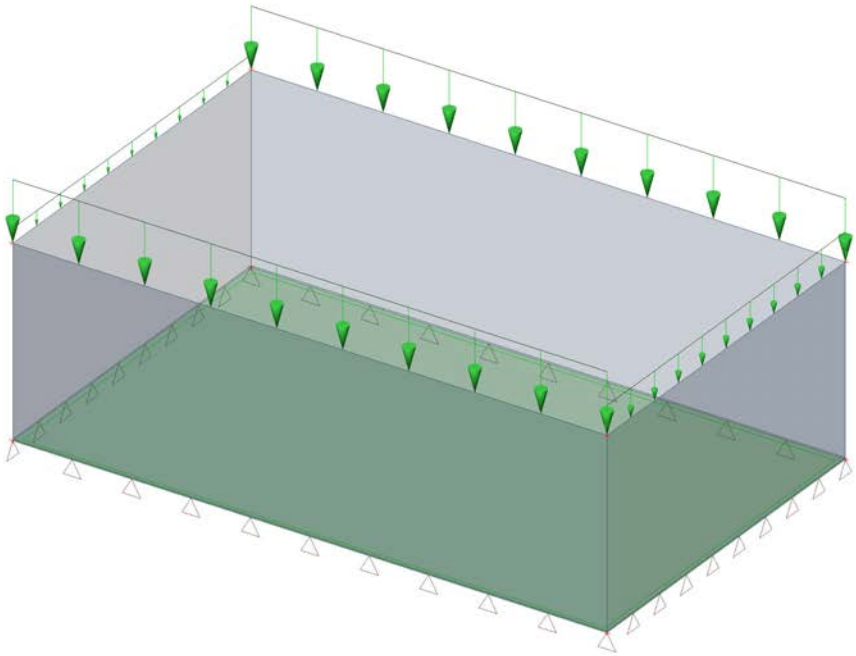
Name	Description	Type	Load cases	Coeff. [-]
SLS-Qp		EN-SLS Quasi-permanent	LC1-Self weigt	1.00
			LC2-Dead	1.00
			LC3-Live	1.00
			LC4-Water pressure	1.00
			LC5-Soil pressure	1.00
			LC6-Surcharge	1.00
SLS-Fr		EN-SLS Frequent	LC1-Self weigt	1.00
			LC2-Dead	1.00
			LC3-Live	1.00
			LC4-Water pressure	1.00
			LC5-Soil pressure	1.00
			LC6-Surcharge	1.00
SLS-Ch		EN-SLS Characteristic	LC1-Self weigt	1.00
			LC2-Dead	1.00
			LC3-Live	1.00
			LC4-Water pressure	1.00
			LC5-Soil pressure	1.00
			LC6-Surcharge	1.00
ULS		EN-ULS (STR/GEO) Set B	LC1-Self weigt	1.00
			LC2-Dead	1.00
			LC3-Live	1.00
			LC4-Water pressure	1.00
			LC5-Soil pressure	1.00
			LC6-Surcharge	1.00

5.4. Result classes

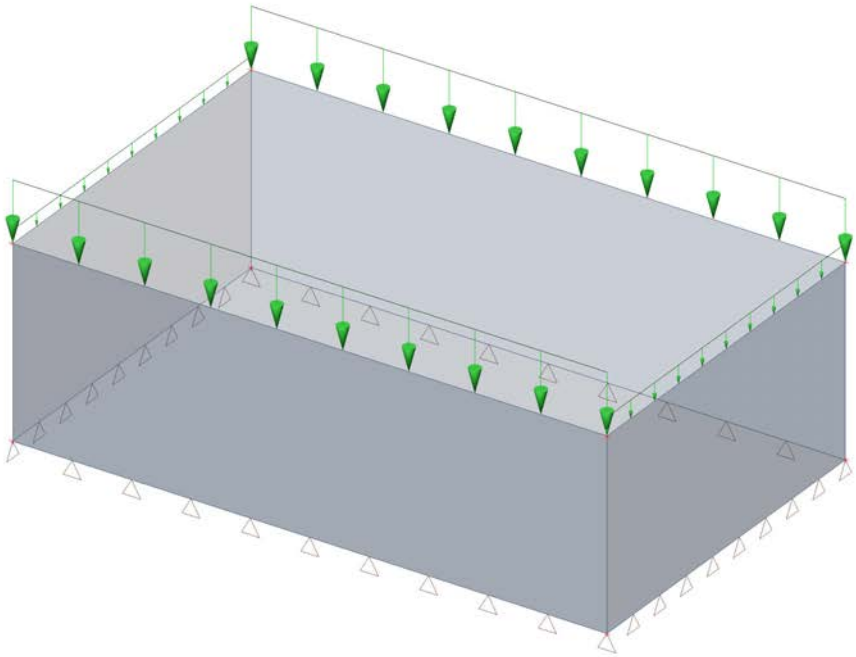
Name	List
SLS	SLS-Qp - EN-SLS Quasi-permanent
	SLS-Fr - EN-SLS Frequent
	SLS-Ch - EN-SLS Characteristic
GEO	ULS - EN-ULS (STR/GEO) Set B

6. Loads

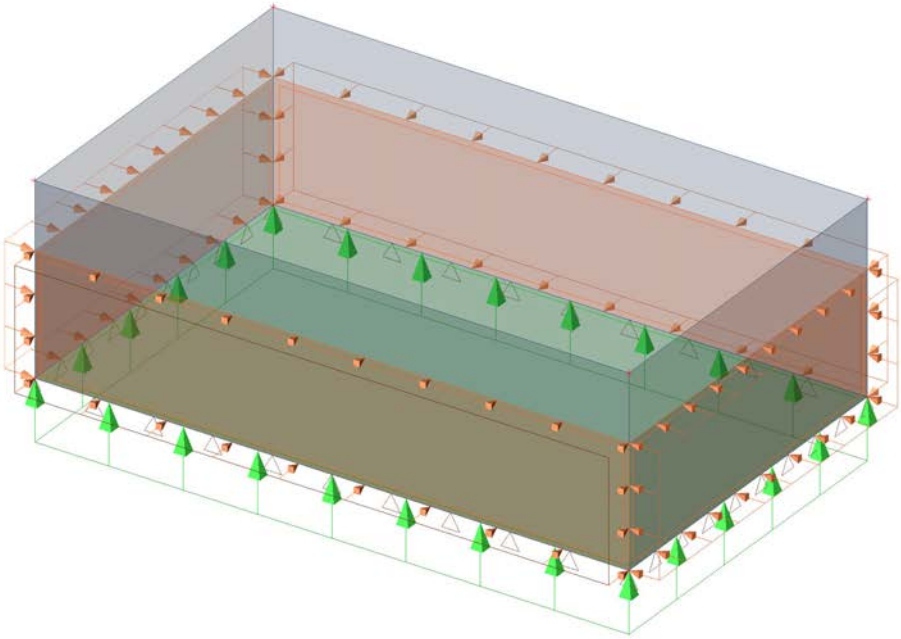
6.1. LC2-Dead



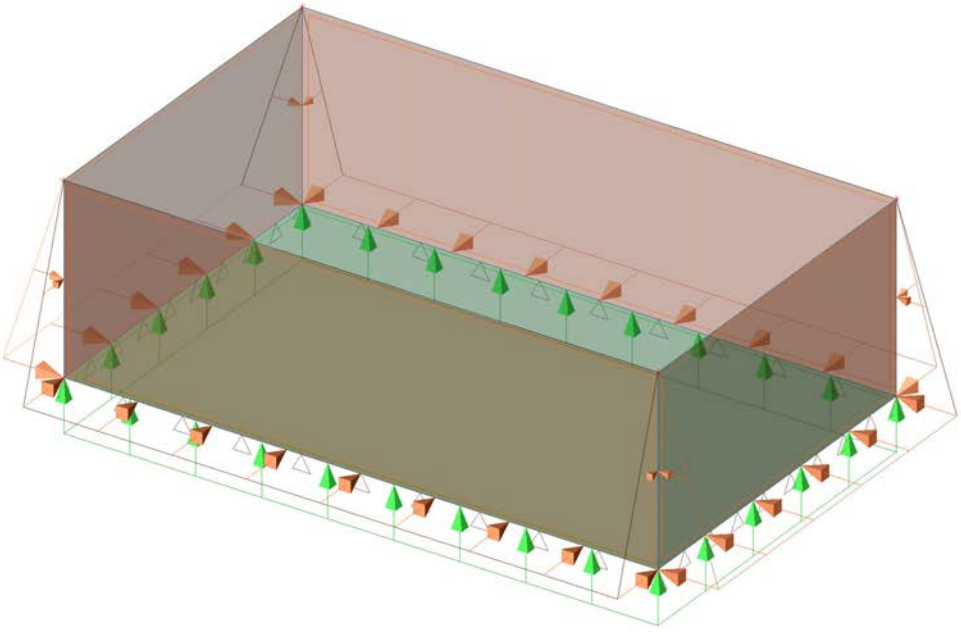
6.2. LC3-Live



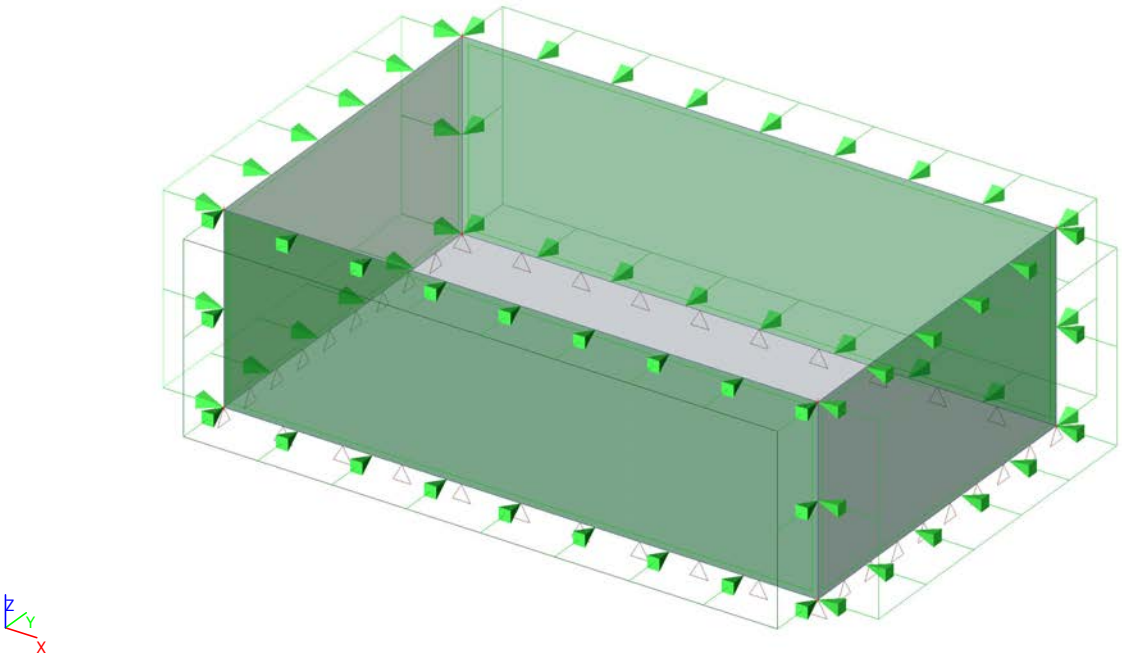
6.3. LC4-Water pressure



6.4. LC5-Soil pressure



6.5. LC6-Surcharge



6.6. Line force on 2D member edge

Name	2D member	Type	Dir	Value - P_1 [kN/m]	Pos x_1	Loc	Edge
	Load case	System	Distribution	Value - P_2 [kN/m]	Pos x_2	Coor	Orig
LFS1	S3	Force	Y	53.50	0.000	Length	3
	LC2-Dead	LCS	Uniform		1.000	Rela	From start
LFS2	S1	Force	Y	53.50	0.000	Length	3
	LC2-Dead	LCS	Uniform		1.000	Rela	From start
LFS3	S4	Force	Y	-12.70	0.000	Length	3
	LC2-Dead	LCS	Uniform		1.000	Rela	From start
LFS4	S2	Force	Y	-25.00	0.000	Length	3
	LC2-Dead	LCS	Uniform		1.000	Rela	From start
LFS5	S3	Force	Y	30.00	0.000	Length	3
	LC3-Live	LCS	Uniform		1.000	Rela	From start
LFS6	S1	Force	Y	30.00	0.000	Length	3
	LC3-Live	LCS	Uniform		1.000	Rela	From start
LFS7	S4	Force	Y	-6.50	0.000	Length	3
	LC3-Live	LCS	Uniform		1.000	Rela	From start
LFS8	S2	Force	Y	-8.75	0.000	Length	3
	LC3-Live	LCS	Uniform		1.000	Rela	From start

6.7. Generated free loads

Name	Load case	2D member	Dir	Type load	Original Load	q [kN/m²]	System
			Distribution	Type		Value - P [kN/m]	Location
GFF1	LC4-Water pressure	S2	X	Surface	FF4	-10.00	GCS
			Uniform	Force			Length
GFF2	LC4-Water pressure	S1	Y	Surface	FF1	10.00	GCS
			Uniform	Force			Length
GFF3	LC4-Water pressure	S3	Y	Surface	FF2	-10.00	GCS
			Uniform	Force			Length
GFF4	LC4-Water pressure	S4	X	Surface	FF3	10.00	GCS
			Uniform	Force			Length
GFF5	LC5-Soil pressure	S1	Y	Surface	FF7		GCS
			3 points	Force			Length
GFF6	LC5-Soil pressure	S2	X	Surface	FF5		GCS
			3 points	Force			Length
GFF7	LC5-Soil pressure	S3	Y	Surface	FF8		GCS
			3 points	Force			Length
GFF8	LC5-Soil pressure	S4	X	Surface	FF6		GCS
			3 points	Force			Length

6.8. Free surface load

Name	Load case	Dir	Type	Distribution	q [kN/m²]	q1 [kN/m²]	q2 [kN/m²]	q3 [kN/m²]	Validity	Select	System	Location
FF1	LC4-Water pressure	Y	Force	Uniform	10.00				Z=0	Auto	GCS	Length
FF2	LC4-Water pressure	Y	Force	Uniform	-10.00				Z=0	Auto	GCS	Length
FF3	LC4-Water pressure	X	Force	Uniform	10.00				Z=0	Auto	GCS	Length
FF4	LC4-Water pressure	X	Force	Uniform	-10.00				Z=0	Auto	GCS	Length
FF5	LC5-Soil pressure	X	Force	3 points		0.00	-57.00	-57.00	Z=0	Auto	GCS	Length
FF6	LC5-Soil pressure	X	Force	3 points		0.00	0.00	57.00	Z=0	Auto	GCS	Length
FF7	LC5-Soil pressure	Y	Force	3 points		57.00	0.00	0.00	Z=0	Auto	GCS	Length
FF8	LC5-Soil pressure	Y	Force	3 points		0.00	0.00	-57.00	Z=0	Auto	GCS	Length

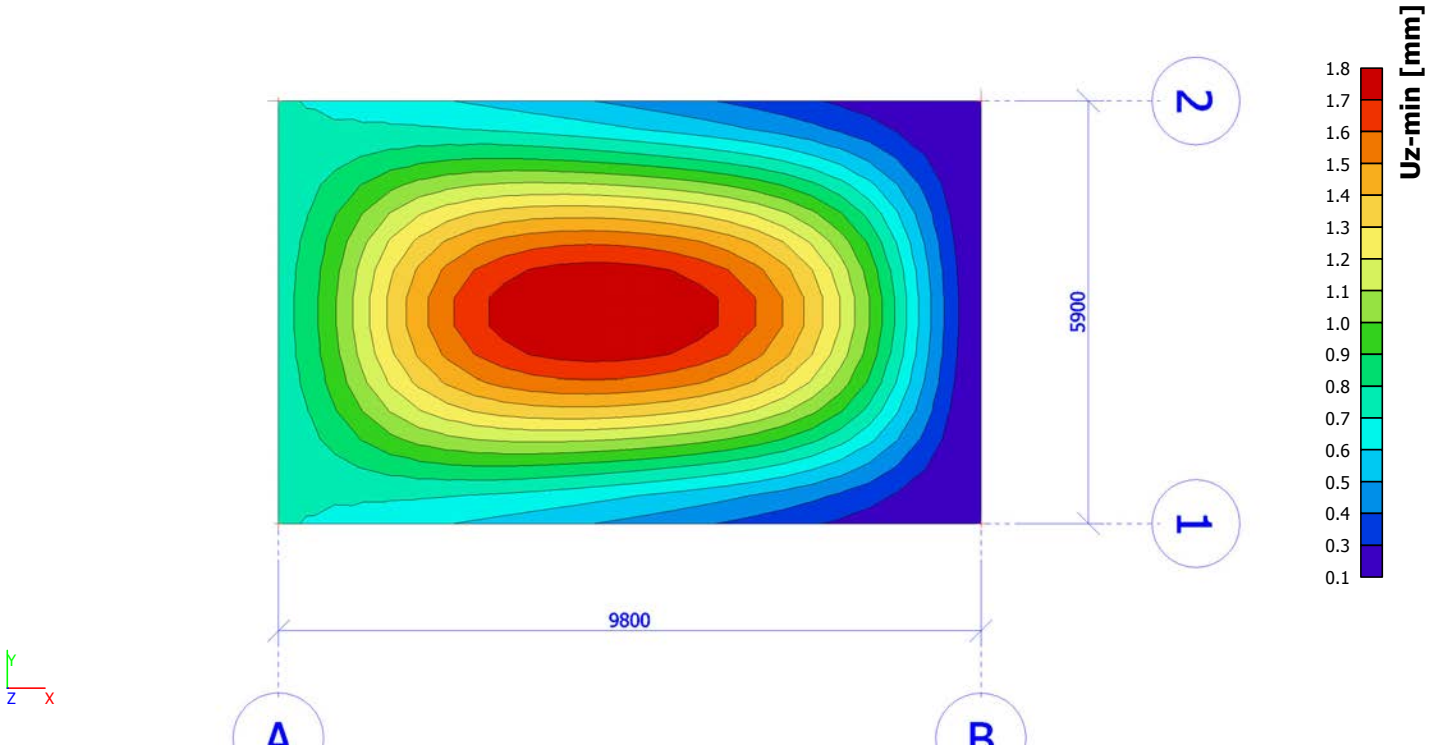
6.9. Surface load

Name	Dir	Type	Value [kN/m²]	2D member	Load case	System	Loc
SF1	Z	Force	20.00	S5	LC4-Water pressure	LCS	Length
SF2	Z	Force	3.30	S4	LC6-Surcharge	LCS	Length
SF3	Z	Force	-3.30	S2	LC6-Surcharge	LCS	Length
SF5	Z	Force	-3.30	S3	LC6-Surcharge	LCS	Length

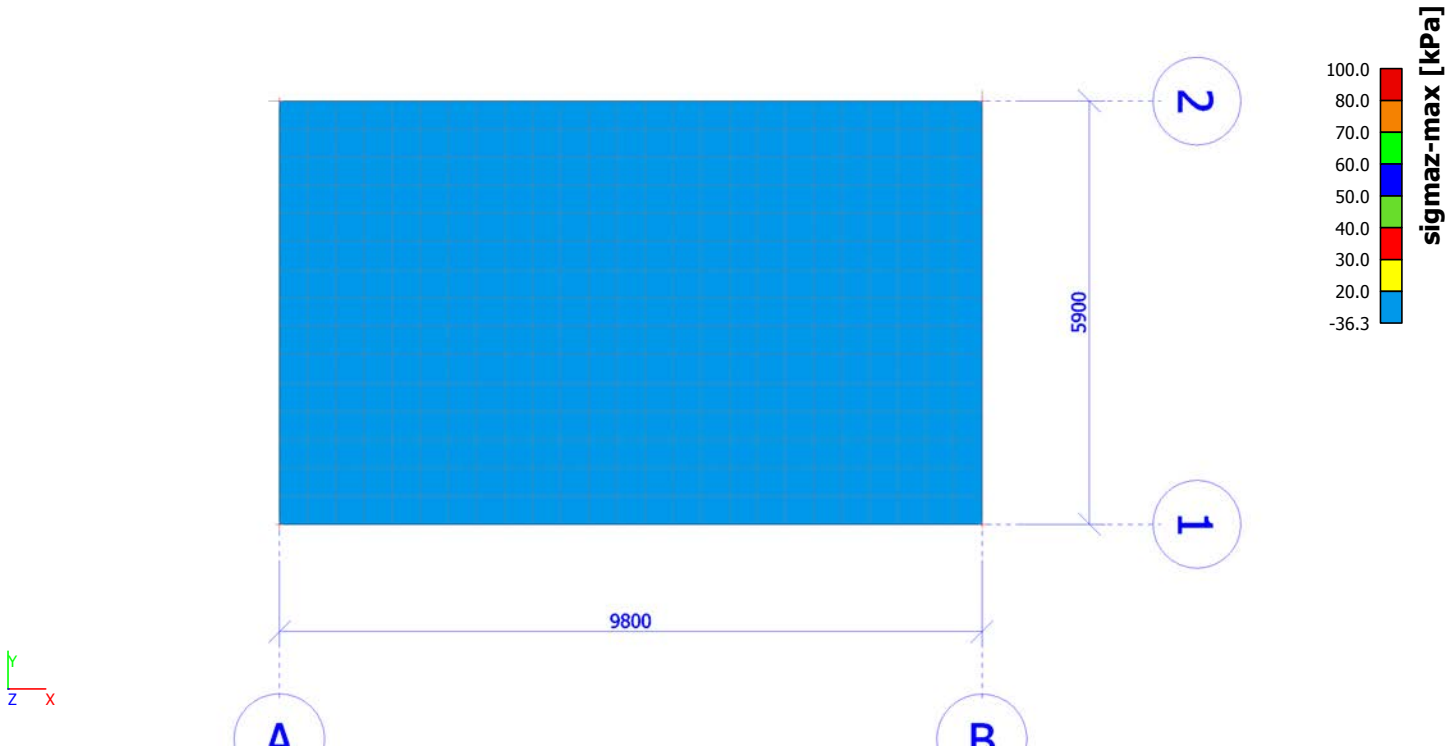
Name	Dir	Type	Value [kN/m²]	2D member	Load case	System	Loc
SF4	Z	Force	3.30	S1	LC6-Surcharge	LCS	Length
SF6	Z	Force	50.00	S5	LC5-Soil pressure	LCS	Length
SF7	Z	Force	-1.80	S5	LC2-Dead	LCS	Length

7. Results

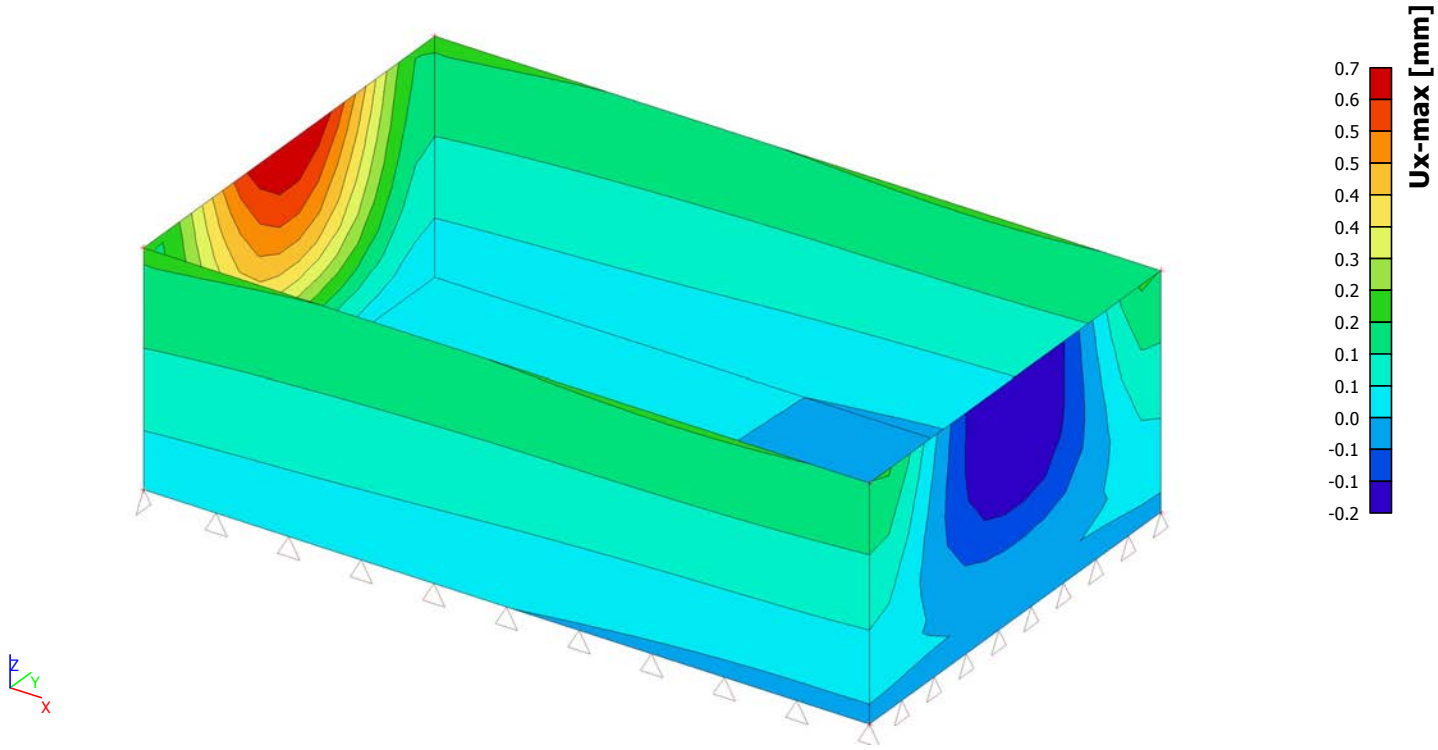
7.1. Displacement of nodes; Uz



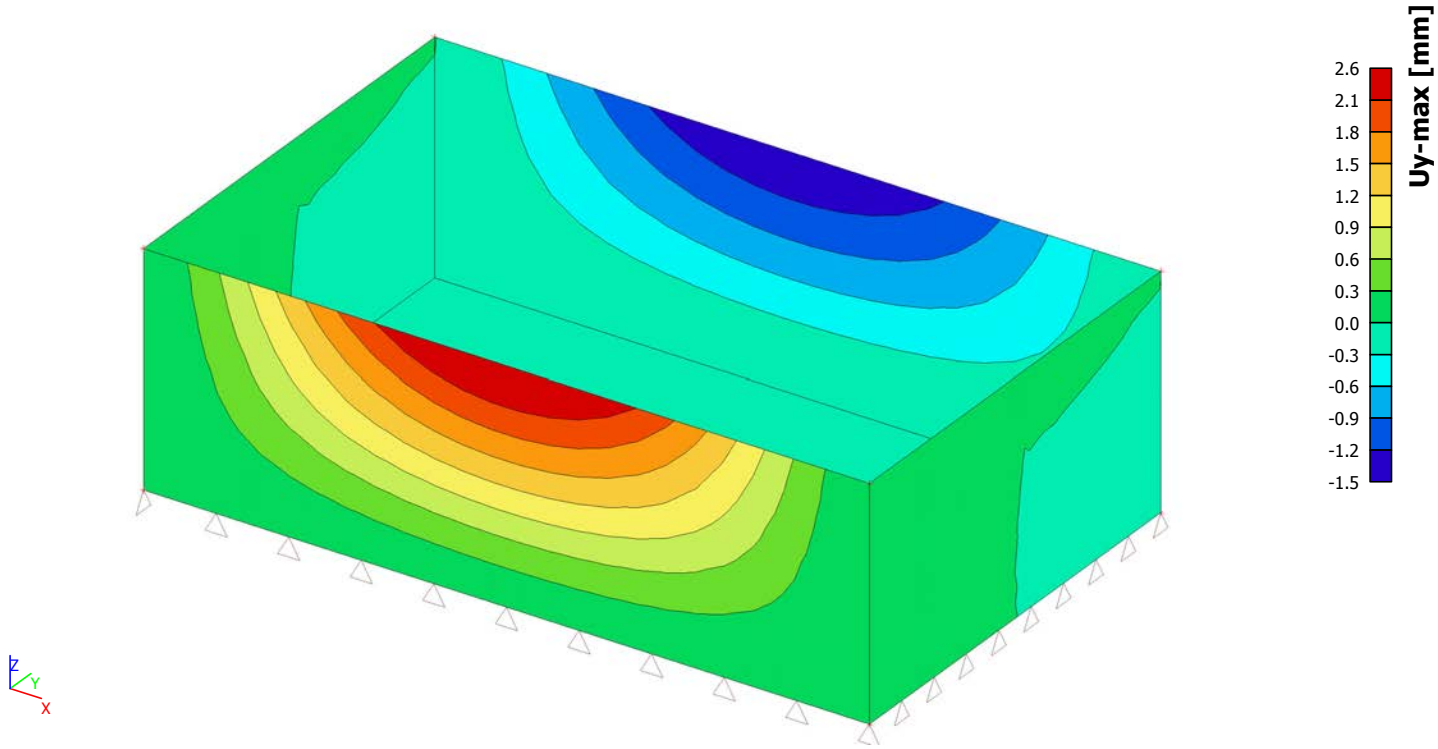
7.2. Contact stresses; sigmaz



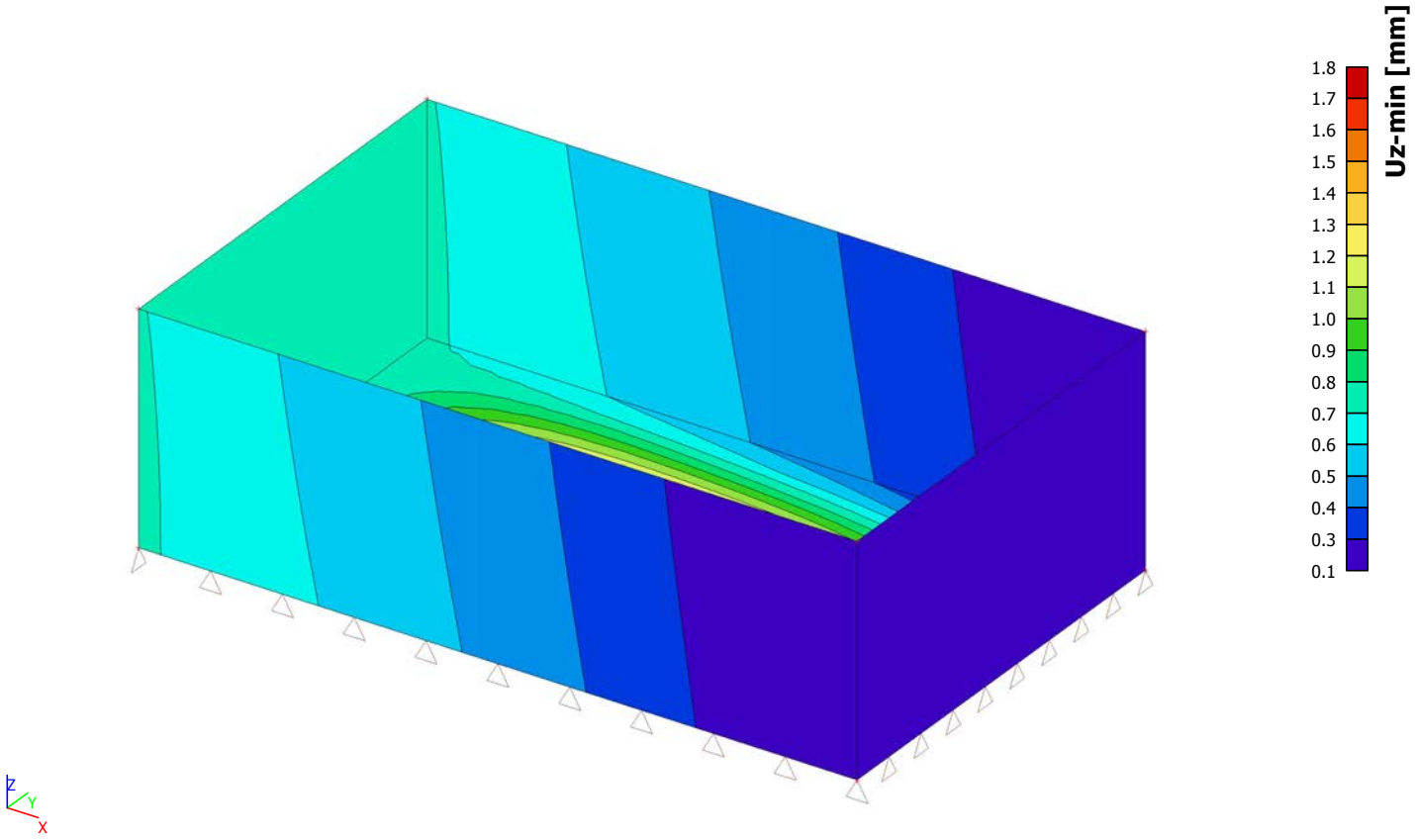
7.3. Displacement of nodes; Ux



7.4. Displacement of nodes; Uy

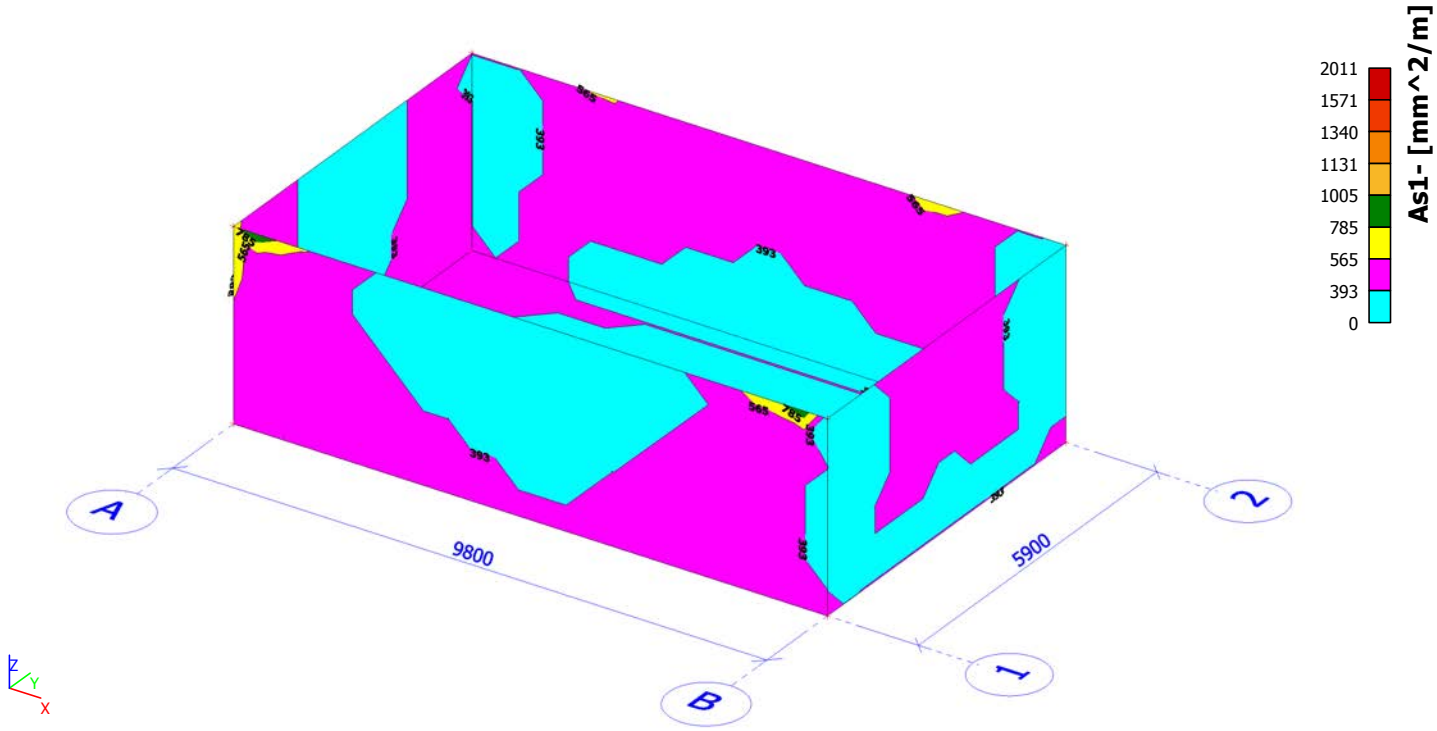


7.5. Displacement of nodes; Uz

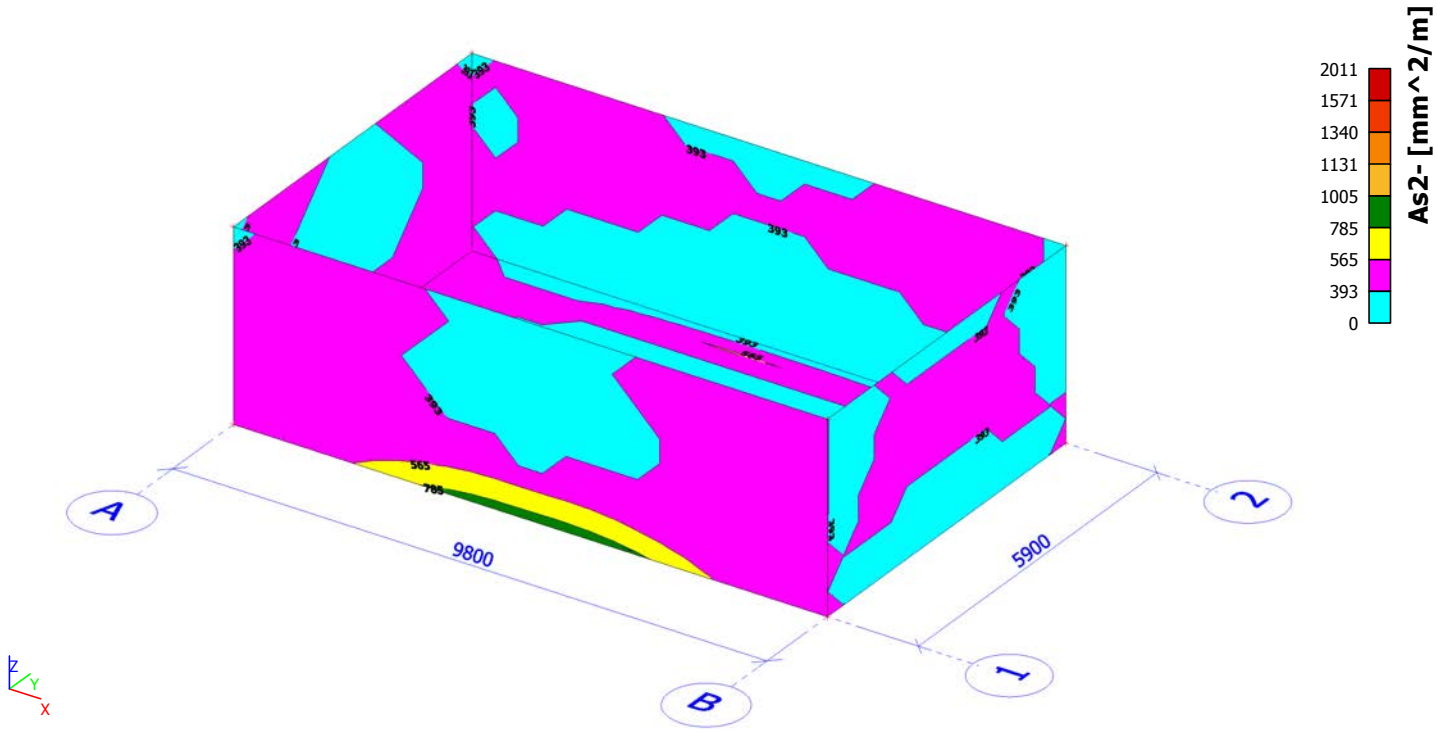


8. Design

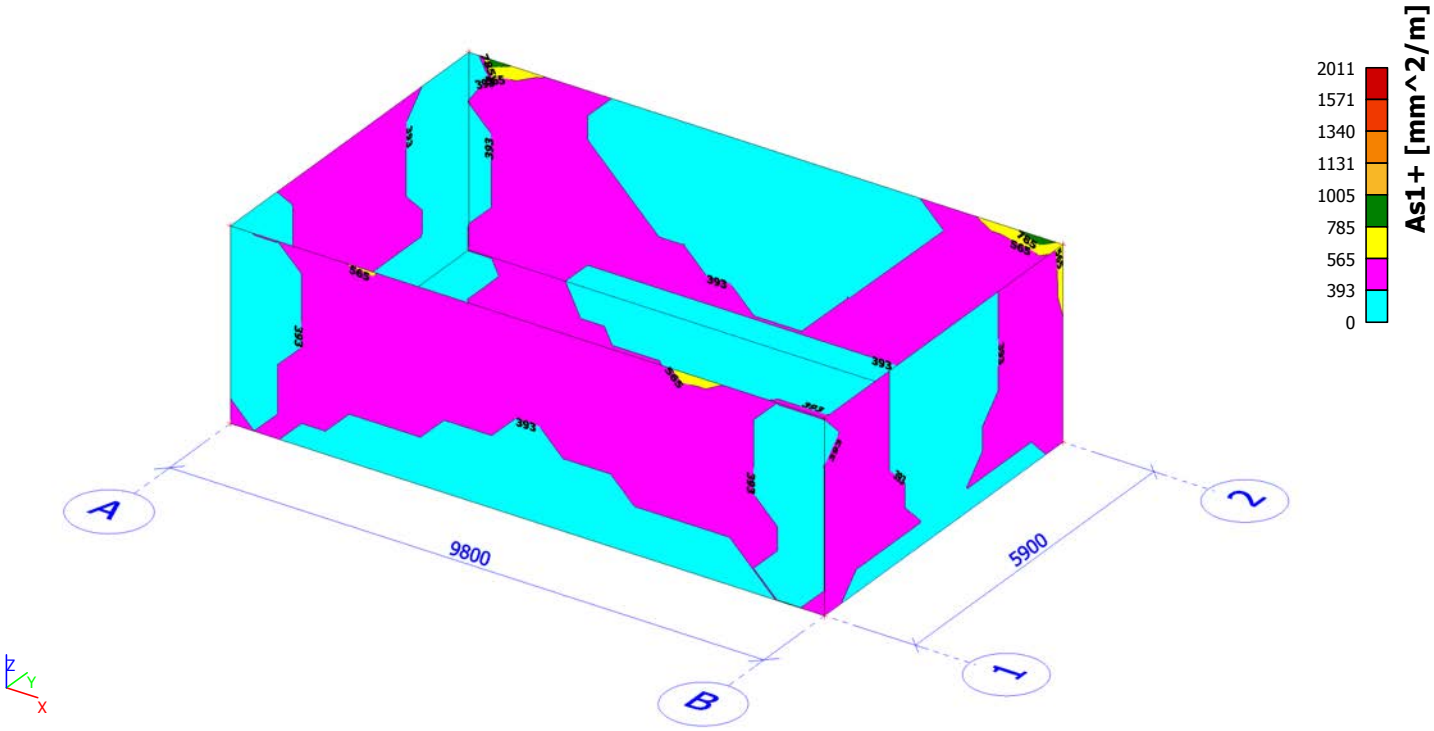
8.1. Member 2D - design - required areas; As1-



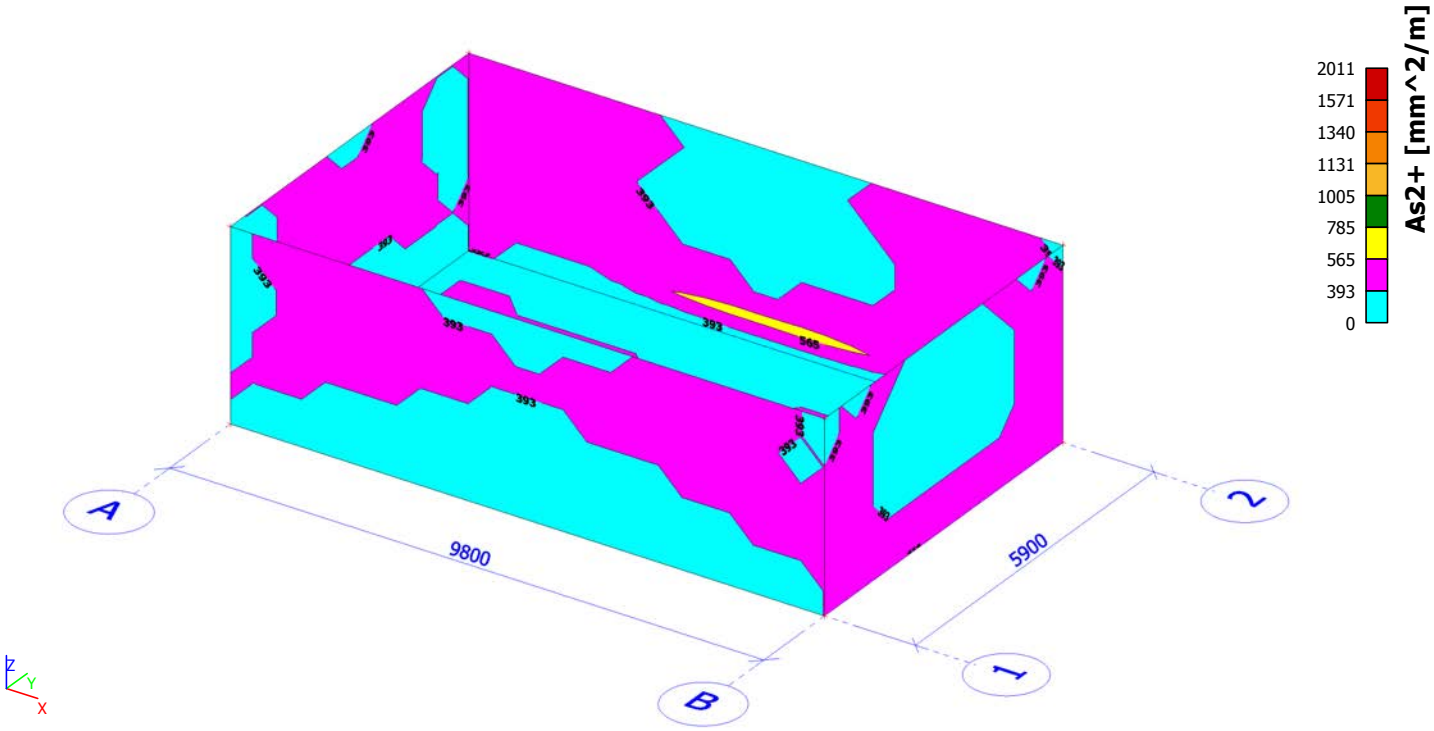
8.2. Member 2D - design - required areas; As2-



8.3. Member 2D - design - required areas; As1+



8.4. Member 2D - design - required areas; As2+



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