SALISBURY CITY COUNCIL

WYNDHAM PARK WALLS

SOLUTION PROPOSAL

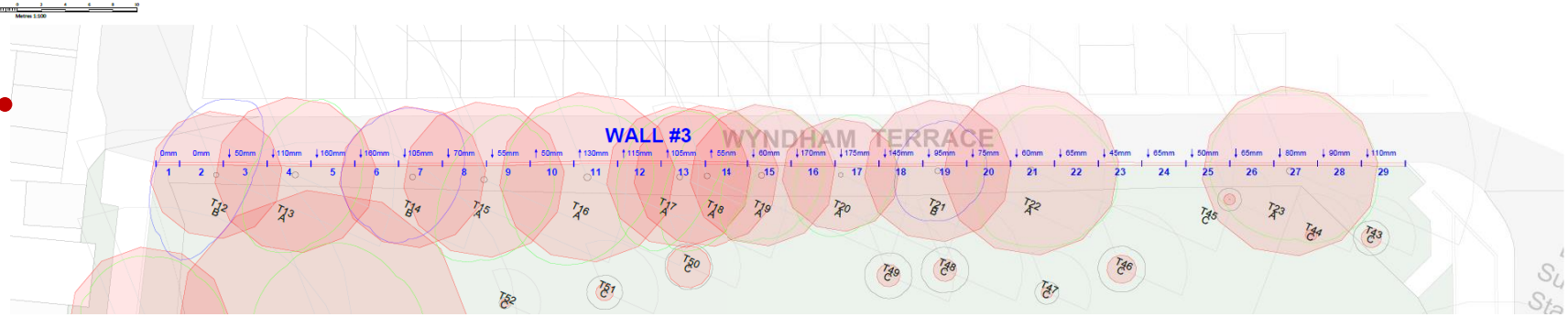
RIBA Chartered Practice

SITE AND SITUATION

All three walls in Wyndham Park are in a poor state of repair but Wall #3, Wyndham Terrace, is a cause for concern due to the amount of 'lean' recorded. The wall, approximately 2.5m in height, is in a dangerous condition.

The causes of the deformation of these walls is the close proximity of the mature trees (1.0m) - refer to the images to the right. The tree roots have damaged the wall footings, passing under the wall in some instances and in doing so, has had a destabilising effect on the walls.

A tree survey has been produced by Bawden Tree Care. This report identifies the existing trees and their root protection areas. It is clear that these trees have had a significant structural impact on the existing walls, but their presence is also now an obstacle to overcome.



Wall #3 Bay 3


EXTERNAL


INTERNAL

Wall #3 Bay 14


EXTERNAL


INTERNAL

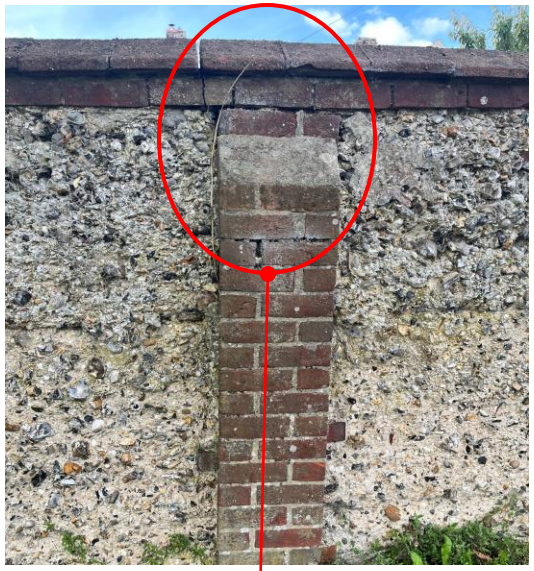
Wall #3 Bay 25


EXTERNAL


INTERNAL

CONDITION OF THE WALLS

Damage to the footpath from tree roots.



Cracking in brick pier.

Top of pier is missing and weathering of the wall.

Loss of wall material at base.

CONSIDERED PROPOSALS

A number of proposals of how to treat the structurally impaired sections of wall have been suggested & discussed:

Steel Columns & supporting framework - The machinery required will have extreme difficulty with access between the trees; there is a large probability that the required drilling will interfere with the existing tree roots, and the required steelwork would be unsightly. The full length of the existing wall will require propping throughout the project, causing significant disruption to Wyndham Terrace; this is therefore NOT feasible.

Brick Buttresses - These require significant foundations, which would interfere with the existing tree roots and are therefore NOT feasible.

Demolish & Rebuild (traditional) - As mentioned in the Structural report, the new foundations for a wall of this height would require additional excavation, interfering with the existing tree roots. The new wall would also be susceptible to future structural damage from the existing tree roots and is therefore NOT feasible.

NOT FEASIBLE

Demolish & Rebuild (screw pile) - An alternative option would be to deconstruct the existing wall, retaining the existing wall capping, install screw piles and form a concrete beam (underside of beam at road level). Build the new wall in concrete blocks (laid on side- 215mm) finish with a lime render and reinstate the original capping (allow for 25% new). New wall to have movement joints every 2 bays running up the side of the brick pier.

Raze to low-level and install a steel post & mesh fence (green) - Where the walls are worst affected, this is considered to be the most feasible option. The walls are to be razed to 450mm above ground level (internally) and repaired where necessary. A Steel Post & Mesh fence is to be installed inside the wall.

Repair - Where possible the walls are to be repaired. This would involve removing all cementitious render & vegetation, filling any holes/cracks (significant repairs to be made using dense concrete blocks) and the walls finished with a coat of lime render (leaving the brick piers exposed on both sides). Allow for brick pier repairs where necessary. This option would have a high cost and wouldn't overcome the structural issues.

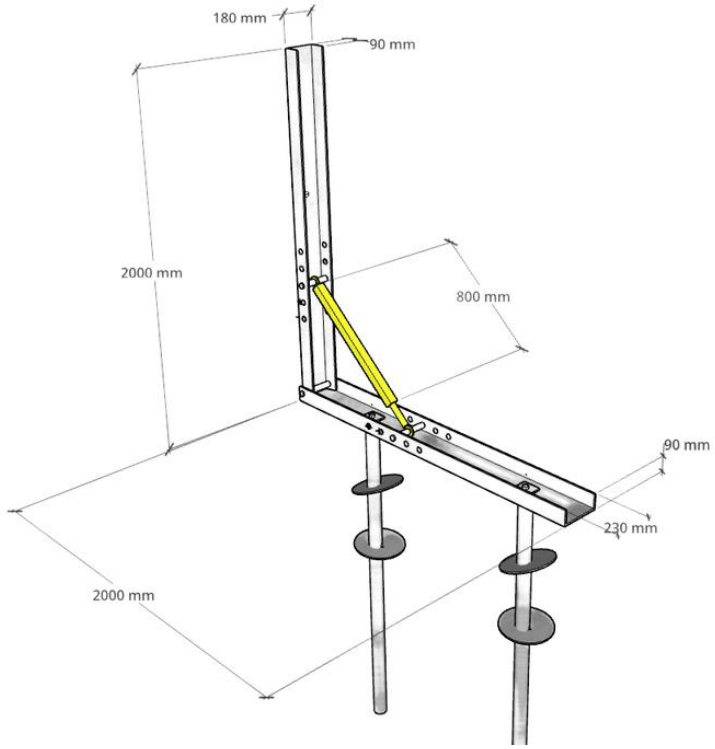
The main priority is the retention of the existing trees and maintain public safety. To leave the wall in its current state would put public at risk, major works to repair the walls would compromise the roots of the existing trees.

PROPOSAL– SCREW PILING

Component Description:

Bespoke steel stabilising frame, designed and fabricated by USP off site, for simple onsite installation by USP team. Reduction in the need for hot works permits, damage to galvanising. Specialist restraint bar that will be powder coated with a hi viz paint solution for general public awareness.

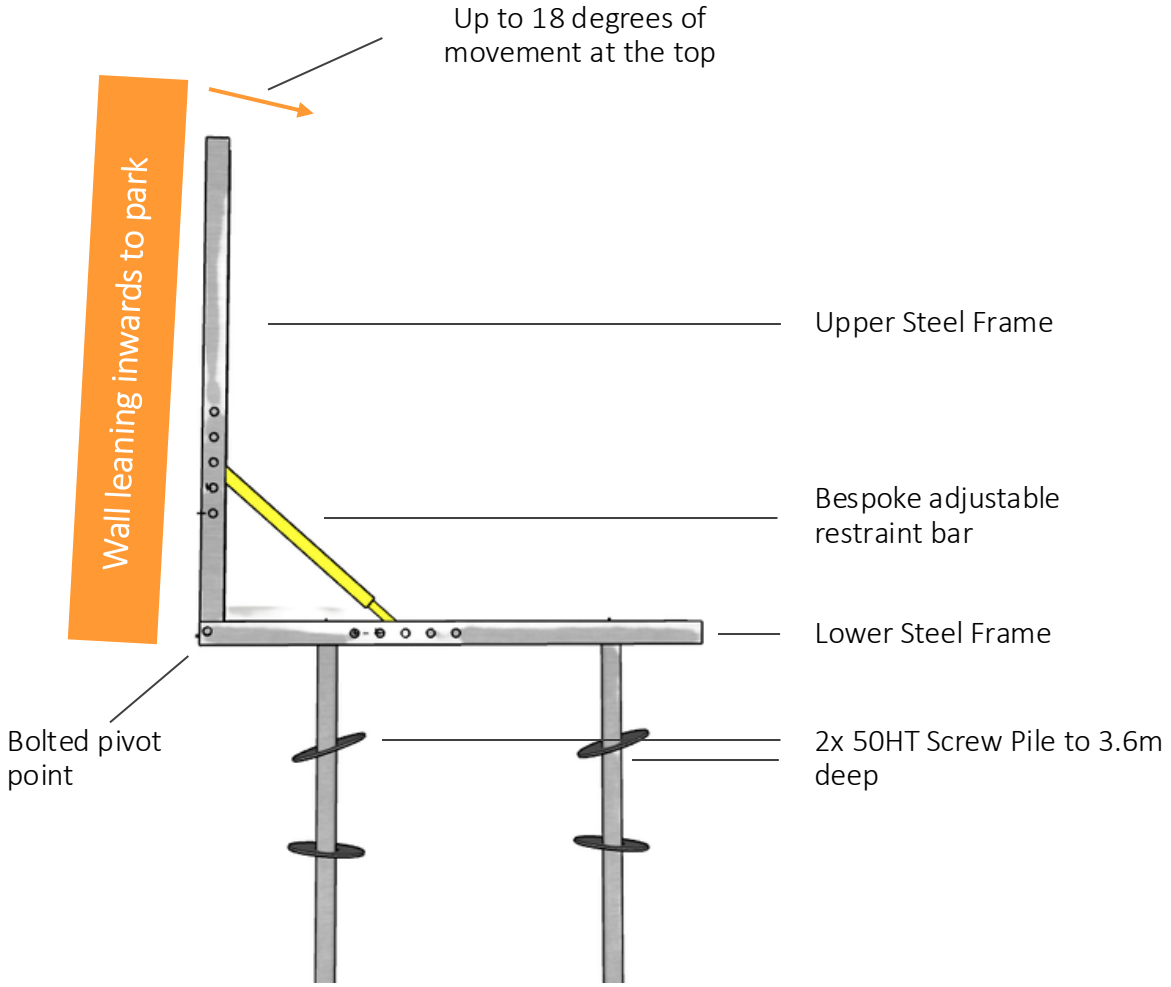
There are two types of stabilising frame. Type 1 and 2 are identical in design, the only difference is type 2 has a restraint cross to hold back the outward lean of the wall.

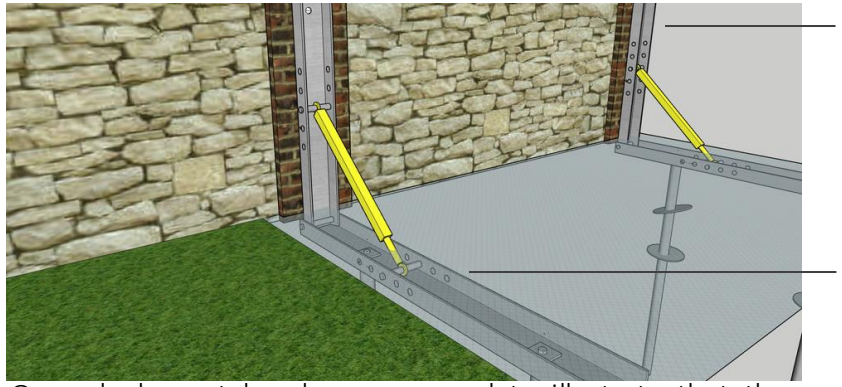


What this method offers:

- Method reduces any vibrations from the installation that would mitigate further damage to the wall and existing trees.
- Offers reduced noise upon installation due to sympathetic location, keeping noise down to a reduced noise level of approximately 72db.
- The screw pile installation is an approved and favoured solution by Arboriculturists with a view to help preserve and reduce severe damage to any tree roots.
- The new bespoke stabilising system will offer full stabilisation for the wall, which can be altered on site depending on the pitch of the wall.
- This screw pile frame solution saves the wall from collapse and offers a sustainable solution that will both work with the tree protection and mitigate any future risk to the general public.

TYPE 1 FRAME SOLUTION

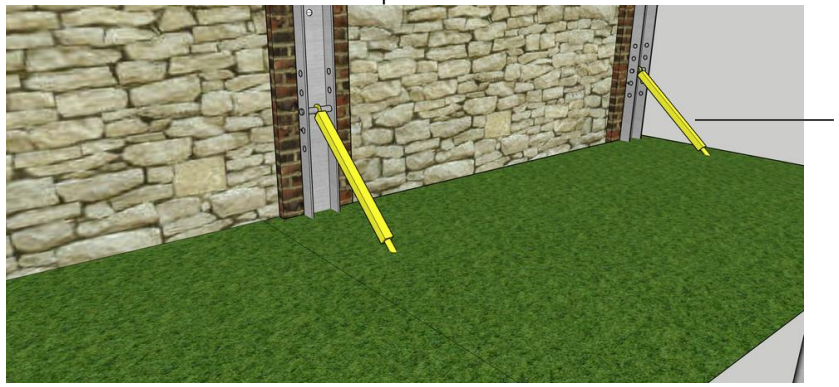




Bolted connection at base and chemically bolted into wall in two locations.

Bolted connection nearest wall and predrilled holes allowing restraining bar to change position.

Ground element has been removed to illustrate that the lower frame will be attached to the top of the screw piles, positioned below-ground level. Soil is replaced over the frame once the solution is in place.

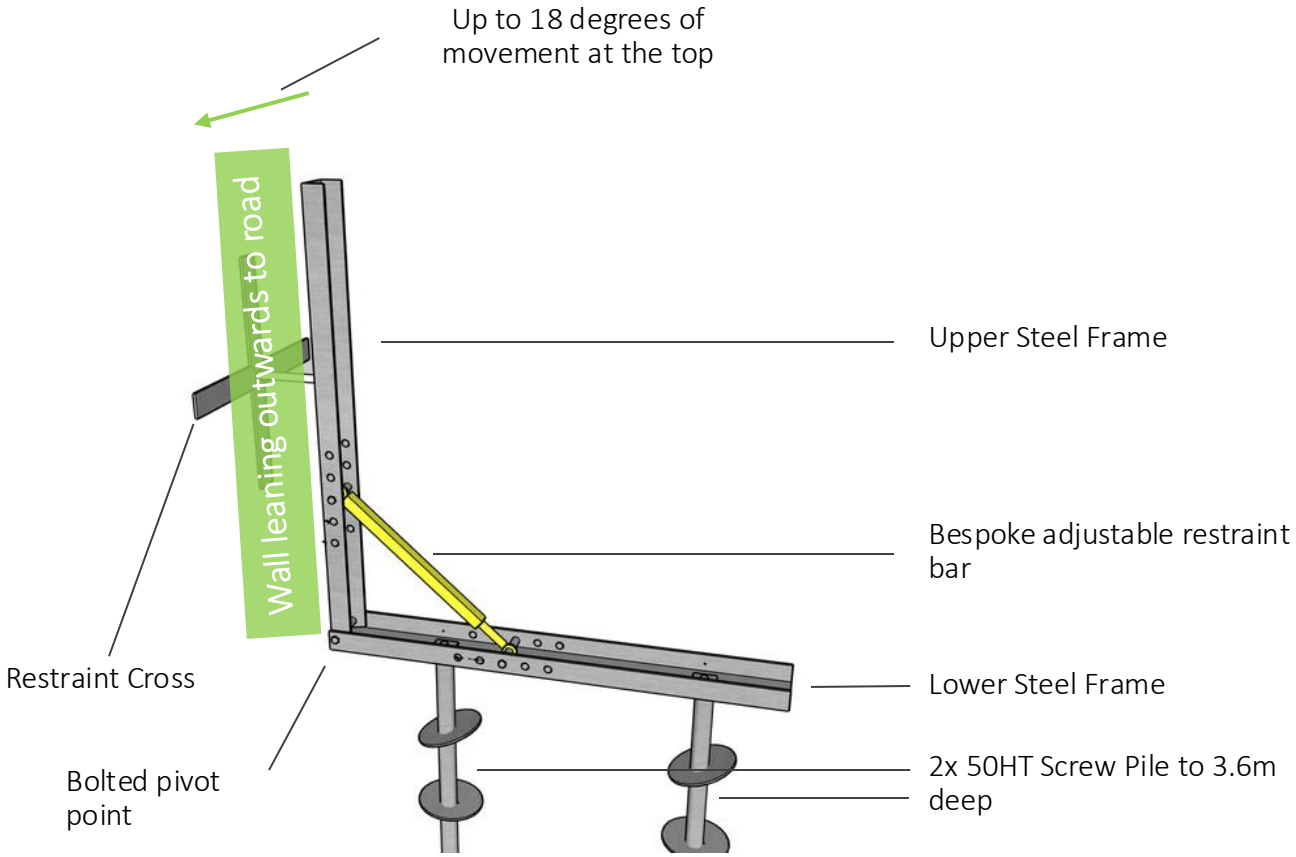


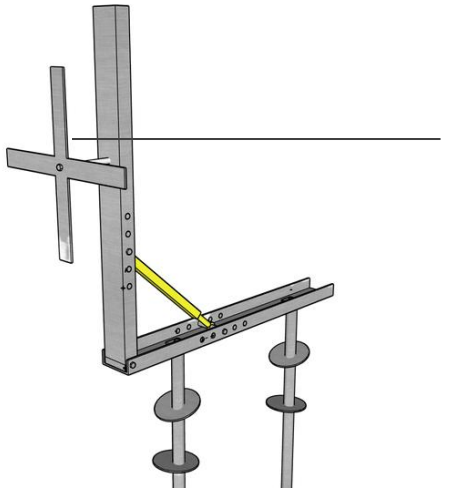
Adjustment on site depending on the pitch of the wall. Hi visibility paint for public awareness.

CAD visual showing how ground will look once grass has regrown

TYPE 2 FRAME SOLUTION

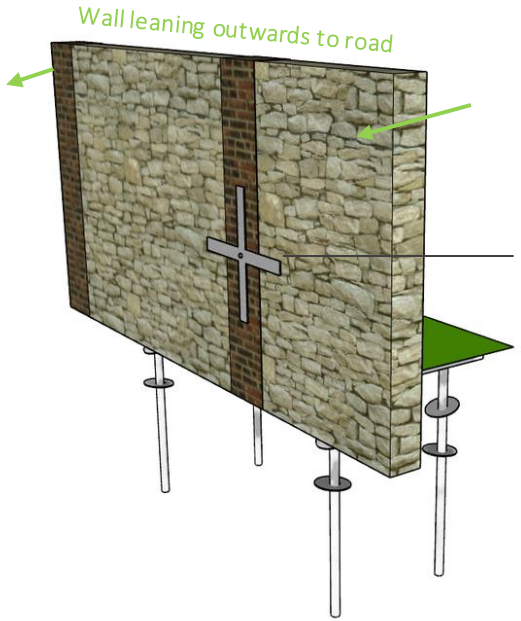
Type 1 and 2 are identical in design, the only difference is type 2 has a restraint cross to hold back the outward lean of the wall.





Rear view from road

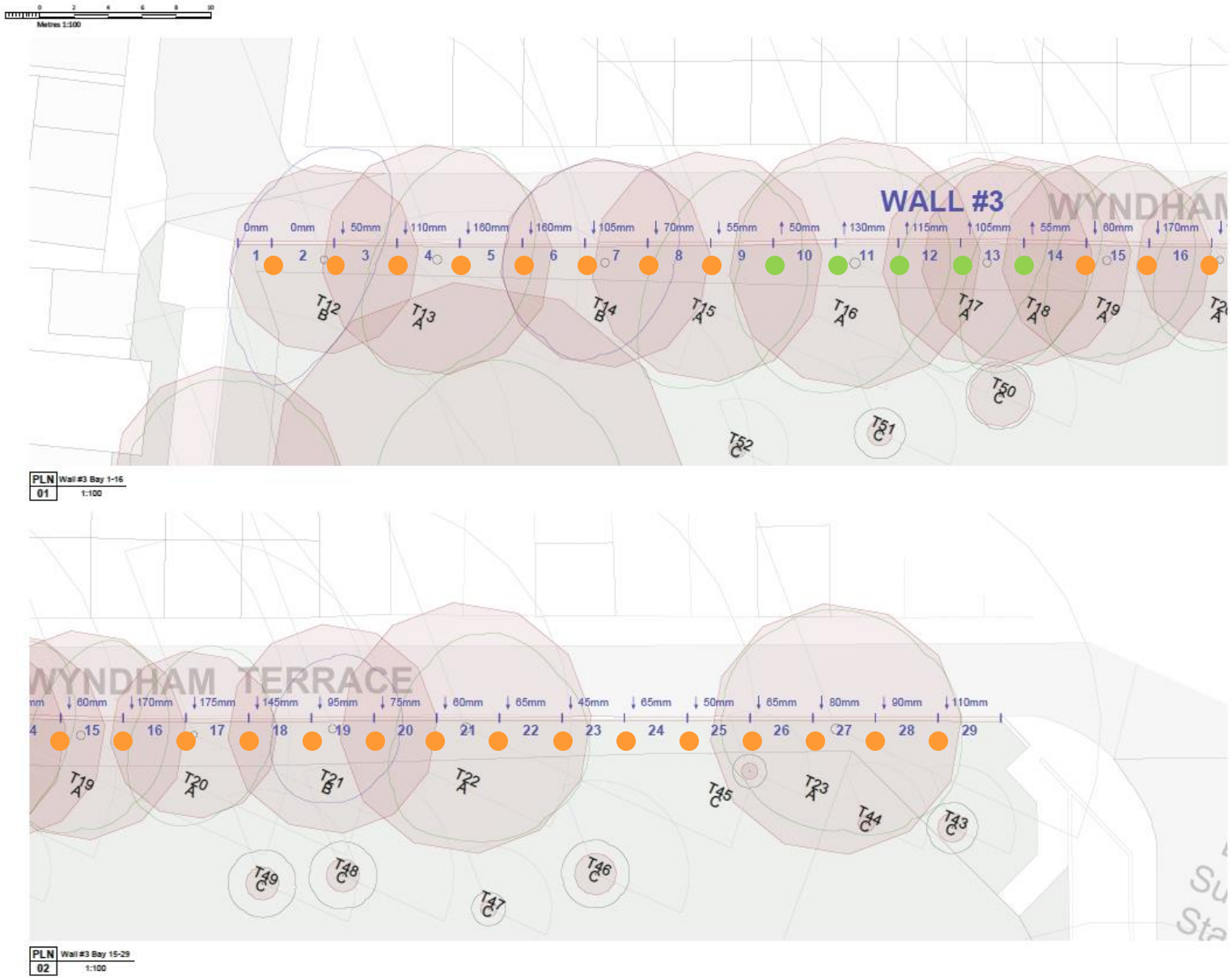
Restraint Cross – Drilled through existing wall with core drill, bolted heavy galvanised cross supporting the wall from the Wyndam Terrace side



Rear view from road with wall example

Restraint Cross

LOCATION PLAN



Location of Type 1 stabilisation frame

Location of Type 2 stabilisation frame

PROPOSAL– MAINTENANCE

The proposed setting out of the piers on the North wall will stabilise the wall but will have a visual impact. But if it is agreed to proceed in this manner then once the work has been completed a program of repair and maintenance should be instigated, not only to the North wall but also to the East and West walls.

Maintenance should be as follows:

Wall 3

Damaged capping bricks should be replaced and pointed in using a lime and mortar mix of NHL 3.5 at a mix of 1 lime to $2\frac{1}{2}$ of washed sand.

Wall 3

All the brick buttress require repointing and where bricks are damaged, they should be cut out and replaced with similar clay bricks. The lime mortar mix for the wall should be NHL 2 at a mix of 1 lime to $2\frac{1}{2}$ of washed sand.

PROPOSAL– MAINTENANCE

Maintenance should be as follows:

Wall 3

We assume the walls would have been rendered with a lime render. These walls have, in many cases, now been re-rendered in places with cement render, which is trapping moisture in the wall and, over the years, has caused damage to the wall's integrity.

Wall 3

Local resident Spencer Hall, a Historic Building Specialist and Conservation Consultant, has carried out an analysis of the wall construction. His findings indicate that it is composed of chalk, flint, and a lime-based mortar. The lime strength appears to be either NHL 3.5 or NHL 5, depending on the proportion of chalk within the mix. Based on this, we propose using a blend of flint and flinty gravel with NHL 5, mixed at a ratio of 1 part binder to 4 parts aggregate.

QUESTIONS