

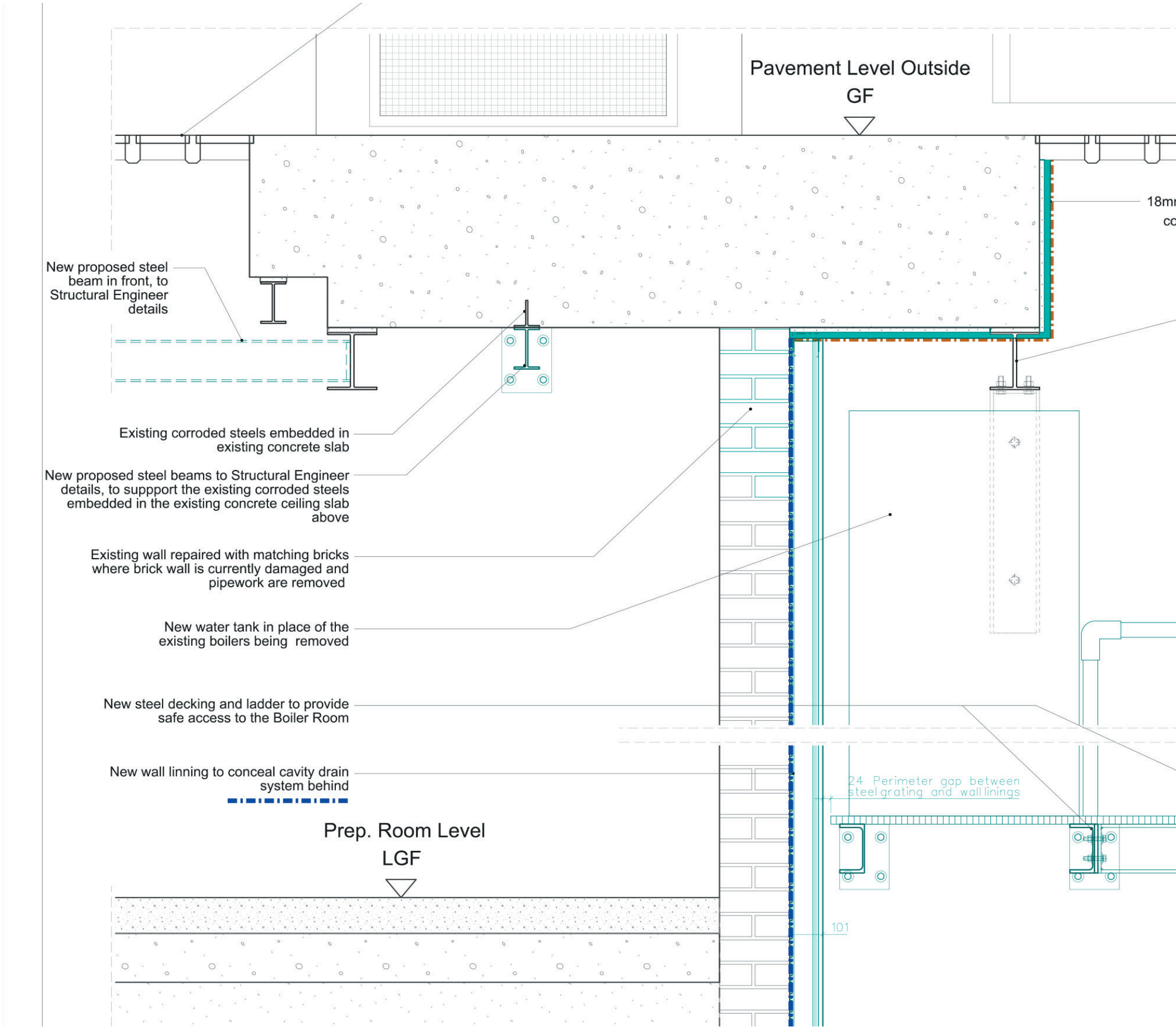
Prop Room - Corrosion of existing steels and proposed remedial works required, Stage level / Lower Ground Floor



The existing structure within the Prop. Room at Stage level has been carefully inspected from below - the top is covered by the pavement and its build-up - to understand its current condition. In many locations the concrete cover on the bottom flange had completely spalled, which was due to the corrosion expansion of the steel beams: when steel corrodes its volume increases up to a factor of ten. The steel beams had suffered from various levels of corrosion: certain areas only had surface corrosion, whereas other areas (typically near the supports) had completely delaminated and could be removed by hand. Hence, the structural integrity of the steel beams - and thereby the Prop Room ceiling as a whole - had been compromised and can't be relied on anymore. The cause of the corrosion is water ingress, in combination with the lack of ventilation (as the steel is encased in concrete). This might have been further exacerbated by the the clinker concrete typically used in those days: when the clinker concrete gets wet it creates a strong acidity which affects the steel.

Photo of one of the existing Prop. Room steels where the corrosion of the steels was quite severe in certain locations, with delamination of the steels themselves.

Prop Room - Proposed remedial works, Stage level / Lower Ground Floor



The structural design philosophy for the remedial works sets out to make the structure safe again whilst balancing this with practical restraints. Removing the existing steel beams would result in digging up the pavement and extensive temporary works as the slabs also prop the external retaining walls. As a consequence, new steel beams are proposed which sit below the existing ones, taking over their support function. Putting these beams in place with a significant level of corrosion protection (by galvanising) will ensure the correct level of support is achieved again. Also, the insertion of the steel beams could be reversed at a later date if it is ever decided to replace the full slab overhead. The new steel beams will be as shallow as possible, not to affect the headroom too much. Depending on the extent of the spalled concrete, steel top plates will be introduced to provide sufficient support width. The area where the concrete is lost will be infilled with grout repair. See drawing 2201-3-330, 335 and 336 for details.

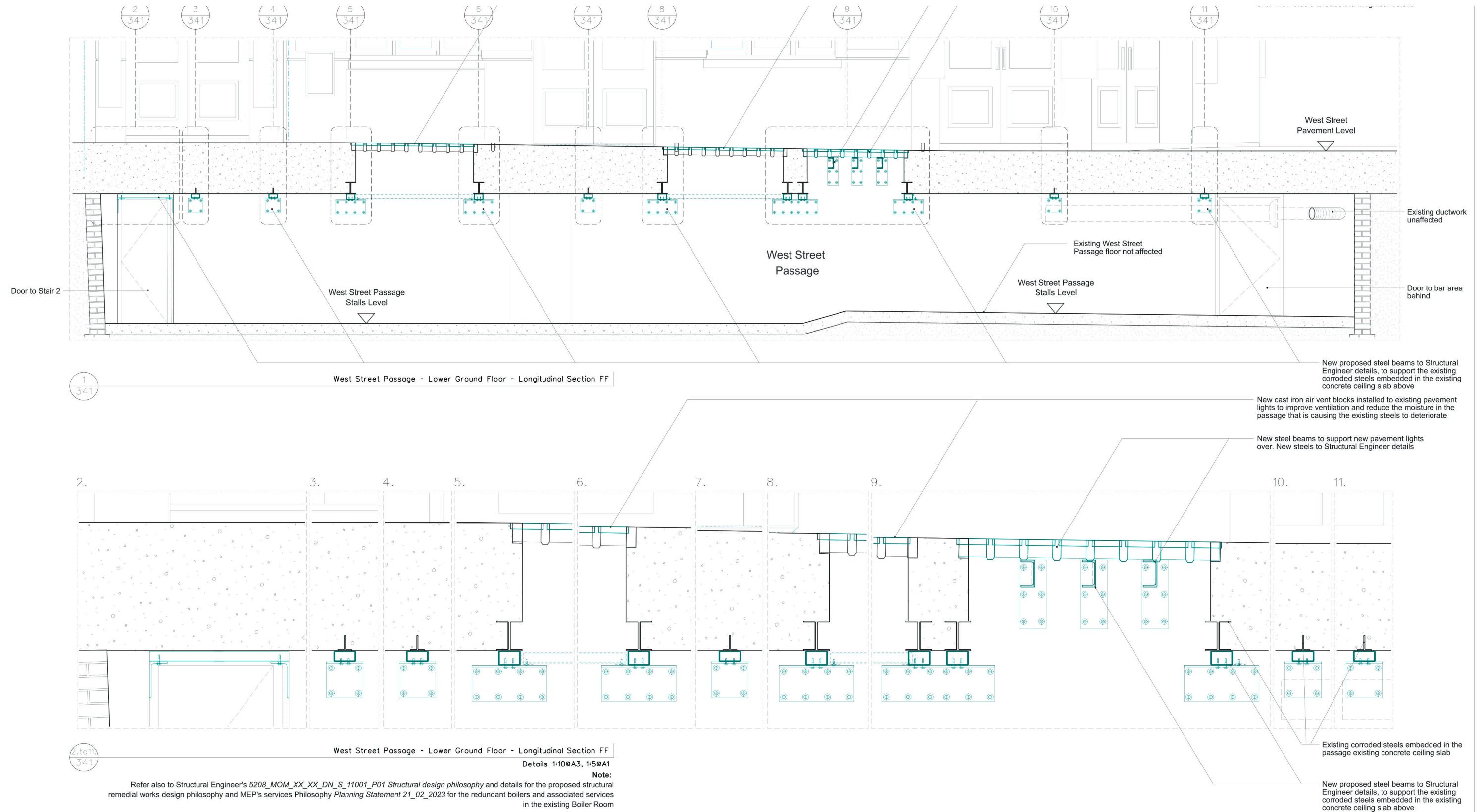
West Street Passage (front of the Theatre) - Corrosion of existing steels and proposed remedial works required, Stage level / LGF



The West Street passage runs along the front theatre elevation and under the public pavement at the front.
As for the Prop. Room existing structure, the West Street passage has also been carefully inspected and presents the same problems: in many locations the concrete cover on the bottom flange had completely spalled and the existing steel beams had suffered from various levels of corrosion compromising the structural integrity of the concrete slab forming the structural sub-layer of the public pavement above. This represents a serious concern in relation to the public health and safety.

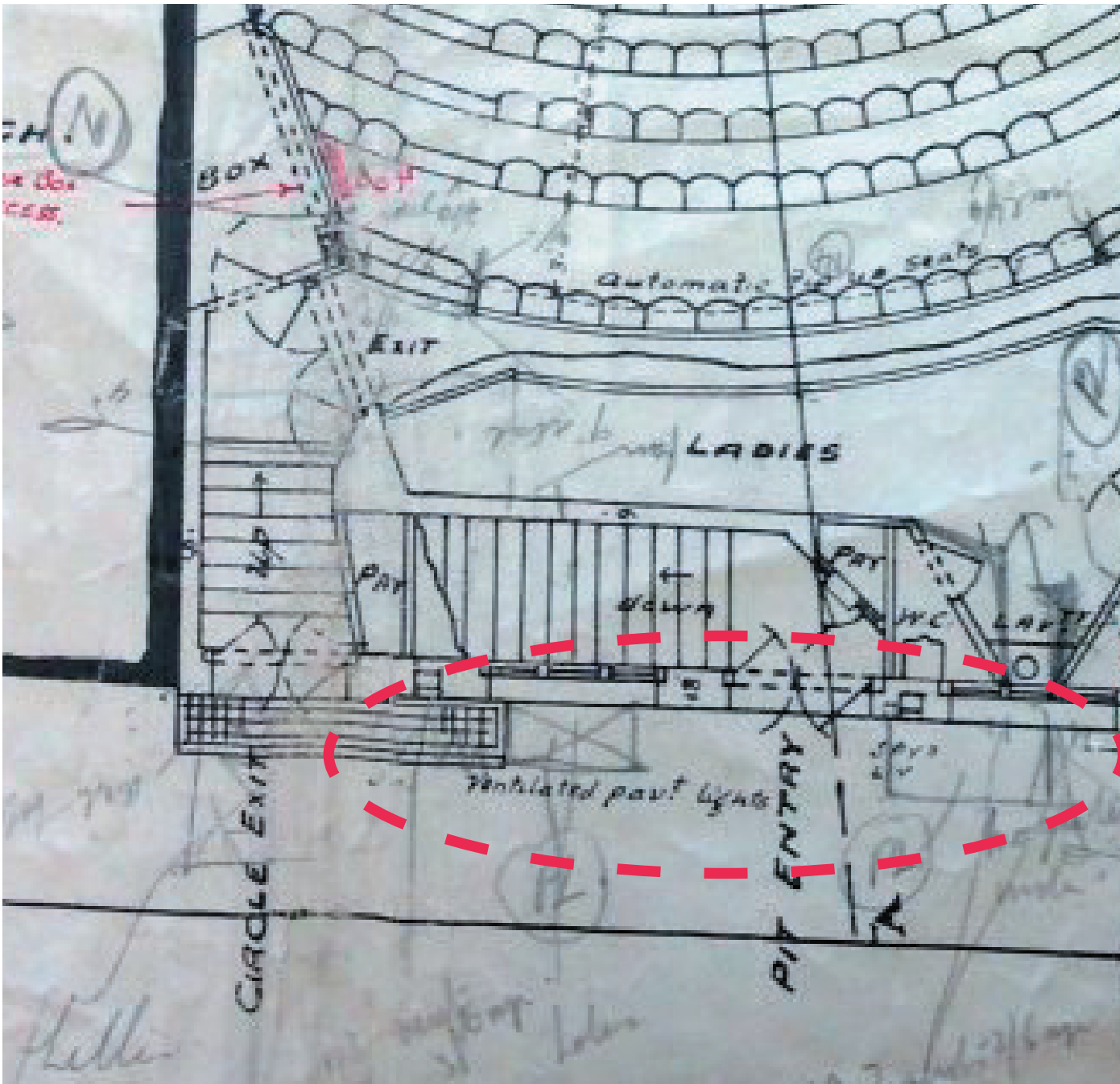
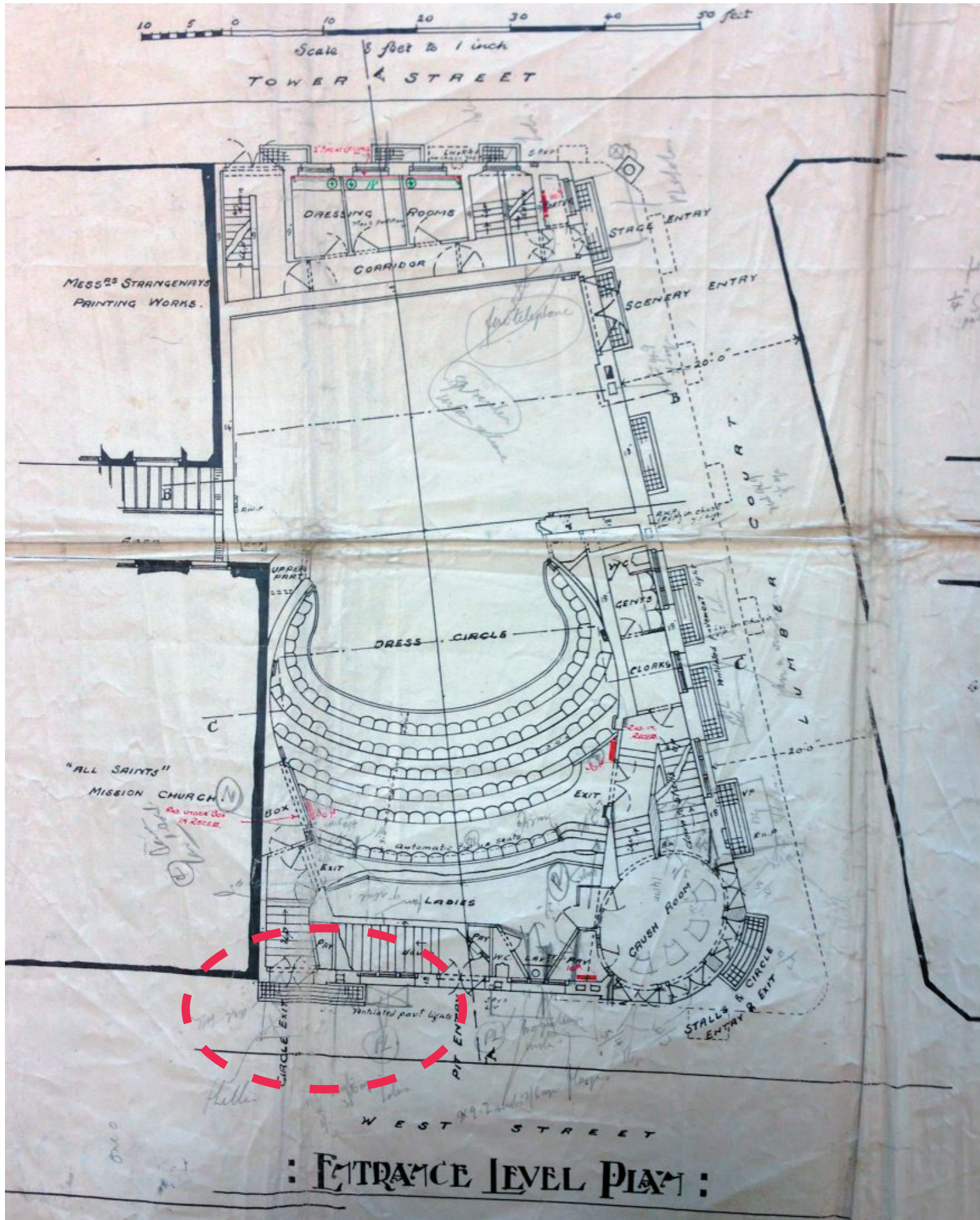
Photo of one of the existing West Street passage where the existing steels show visible signs of corrosion and delamination.

West Street Passage (front of the Theatre) - Proposed remedial works required, Stage level / LGF



As for the Prop. Room it is proposed to install new shallow steel beams below the existing ones, taking over their support function as a reversible remedial work approach. See drawing 2201-3-340_G and 341 for details.

West Street Passage (front of the Theatre) - Proposed remedial works required, Stage level / LGF



To improve ventilation and reduce the moisture content within the front West Street pas-sage - in particular to the existing and new proposed steel structure and concrete ceiling slab - it is proposed to install new cast iron vent blocks (such as <http://castironpavementlights.com/lenses-blocks/>) in place of the existing pavement lights glass blocks - See drawing 2201-3-340_G and 341 for details.

Sprague's 1913 Ground Floor plans attached here show that ventilated pavement lights were also originally installed to the pavement lights along the perimeter Lower Ground Floor areas of the Ambassadors.

Conclusion

During the course of the recent renovation works, several significant defects have been revealed similar to those identified under the Listed Building consent ref. 2022/5141/L which require urgent remediation works:

- Water egress into the basement level, namely to the Boiler Room;
- Delaminating of steel beams above basement level, affecting structural capacity of the floor slabs, namely to the Prep. Room and front West Street passage.

In terms of the proposed the works summarised in this document, these are the minimum necessary to remedy the identified deficiencies and, as a matter of principle, are beneficial to the long-term preservation of the building and its structure. The proposed works below will prevent the structure from failing at some future date and provide safe access to utilitarian areas of the existing building:

Damproofing of basement in the Boiler Room

- Use of cavity drain system to the external perimeter walls of the Boiler Room;
- The use of a 18mm Sika render on the ceiling slab (this being the only viable means of preventing water ingress from pavement level) and up to 6mm waterproofing to the Boiler Room floor.

Improve access and means of escape to the Boiler Room

- Removal of the existing gas-fired boilers and new hot water heater/ tank will be repositioned at stage level and mounted on a new mezzanine decking;
- It is proposed that an access staircase is installed from the stage to sub-stage level together with a new mezzanine deck and handrail to provide safe means of access and egress.
- A new fire escape route is proposed to be introduced at sub-stage level to provide a secondary means of escape in accordance with the current Building Regulations.

Installation of new steel beams to support the existing basement ceiling slab within the existing Prop. Room and front West Street passage

- These works are predicated on supporting the existing structure and guarantee the durability of the structure;
- The new steel supporting beams will follow the existing structural arrangement and - The works have been designed to guarantee the durability of the existing structures and to avoid adverse impact on the space below.

The new steel beams will be as shallow as possible, to avoid affecting the functional headroom within these spaces;

- The insertion of the new steel beams can be done without removal of historic fabric and can be reversed at a later date if it is ever decided to repair/ replace the full slabs overhead;

The need for the works has become known following investigations and works in relation to the recently permitted works undertaken under the Planing and Listed Building consent 2022/3105/P, 2022/3599/L and 2022/5141/L in particular.

These works are urgently necessary to prevent ongoing damage to the theatre and to address considerable issues in terms of corroded steel work and significant damp issues where the proposed remedial works will arrest ongoing deleterious processes in the building and secure the longevity of its structure