

CONDITION SURVEY REPORT

FOR

WEATHERPROOF EXTERNAL FALSE CEILING SYSTEM

AT PODIUM LEVEL OF THE BELCHER'S

NO 89 POK FU LAM ROAD

HONGKONG

Report Prepared by
Savills Project Consultancy Limited

Survey Date: 15 MARCH 2019, 21 MARCH 2019, 22 MARCH 2019

Report date: 24 APRIL 2019

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- A. Photo Record
- B. Location Plan

1.0 INTRODUCTION

Savills Project Consultancy Limited was appointed by Shun Tak Property Management Limited (hereinafter referred to as the 'Client') to carry out condition survey for the weatherproof external false ceiling system at Podium Level of the Belcher's, No 89 Pok Fu Lam Road, Hong Kong (hereinafter referred to as 'the Ceiling System').

The purpose of this survey is to assess the condition of the Ceiling System, and recommend the remedial works or further detailed investigation if deemed necessary.

2.0 DESCRIPTION OF THE CEILING SYSTEM

The Ceiling System has been built for about 20 years and situated at Podium Level of Tower 1, Tower 2, Tower 3, Tower 5, Tower 6 and Tower 8 of the Belcher's, No 89 Pok Fu Lam Road, Hong Kong.

The Ceiling System is a closed space design mainly composed of two kinds of material which are Galvanized Mild Steel (GMS) and aluminum.

The metal frame was constructed by GMS L-angle. Pieces of GMS base plate were attached to the structural ceiling by anchor bolts and GMS L-angles were linked to the base plate by welding.

Aluminum ceiling grids were fixed on GMS L-angles by screws. Each aluminum panel with rubber gasket on the edges was laid on grid frame with bracket to form a strong sealed ceiling system.

We have also retrieved approved general building plans from the Buildings Department in order to obtain a general understanding of the buildings / structures associated with the Ceiling System. However, neither detailed drawings nor structural calculation of the Ceiling System could be found since statutory submission for the Ceiling System was not required 20 years ago.

3.0 THE SURVEY

In order to obtain the overall condition of the Ceiling System, visual inspection was carried out on 15 March 2019, 21 March 2019 and 22 March 2019. The weather condition on these days was cloudy / rainy.

Condition survey to the Ceiling System was conducted by a team of surveyors (Building Surveying) on the above dates, which was based on visual inspection with the aid of digital cameras and hand torch to identify any defects and deficiencies. Neither destructive nor non-destructive tests of building fabric have been carried out.

Photo Record refers to Appendix A.

4.0 ACCESSIBILITY

The survey was confined to visual inspection from openable access panels of the Ceiling System with the aid of scissor platform where accessible.

Location Plan refers to [Appendix B](#).

5.0 SURVEY FINDINGS

Listed below are major findings during our inspection,

Defects	Photo No. Ref.
A) Missing ceiling panels possibly due to typhoon (total 103 pieces of ceiling panels missing; area approx. 40m ²)	A27, A41, A48, A50, B16, B30, B47, B48, B49, B54, B55, B66, B68, B69, C14, C27, C28, C29, C41, C42, C43, C44, C50
B) Damaged ceiling grids with screws remaining	B39, B40
C) Damaged ceiling panels forming gap	A6, A13, C68
D) Rusty ceiling grids	A34, B12, B13, B14, B15, B36, B37, B42, B58, B59, C38, C49, C59
E) Discrete ceiling grids	C31, C32
F) Missing screws on GMS plates	C26
G) Rusty bolts and washer plates	B22, B46, C33
H) Rusty GMS plates and GMS posts	B29, B46, C6, C24, C26, C33
I) Rusty brackets connecting ceiling grid and access panel	A4, A12, A15, A25, A29, A40, A45, B4, B5, B14, B23, B34, B58, B64, C7, C13, C19, C21, C34, C40, C48, C55, C58, C65
J) Rusty brackets connecting ceiling grid and ceiling panel	A22, A37, B6, B20, B27, B35, B44, B52, C5, C23, C34, C47, C54, C63, C64
K) Rusty welded joints due to missing of galvanized paint	A16, A17, A19, A24, B19, B25, B26, B29, B41, B43, B53, C12, C39, C53
L) Rusty screws	A46, B28, C58, C64, C65
M) Defective weld joint	A32
N) Unused materials and debris on ceiling panels	A18, B57, C10, C11, C22, C37, C57

6.0 CONCLUSION

Based on our observation, condition of the steel frame of the Ceiling System was considered acceptable; the aluminum ceiling grid and ceiling panels are in fair condition with a number of defects. However, no structural calculation record can be found for the design wind load. Moreover, the wind load requirement from Buildings Department has been updated. In this regards, it is a doubt that the design of the existing Ceiling System can fulfill the current standard.

According to our inspection on those days, it was found that the Ceiling System has suffered certain degree of damages but, even so it does not constitute obvious hazard or imminent danger to life or property.

7.0 RECOMMENDATION

As mentioned in the previous sections, there were some missing panels which will create a weak point. The remaining ceiling panels will be further damaged or blown away. In this connection, we recommended to rectify the defects with the following 3 approaches.

- 1) Patch repair
 - a. Remove rusty stains on reachable steel members and apply one coat of galvanized paint on surfaces.
 - b. Re-install damaged ceiling grids.
 - c. Replace missing aluminum ceiling panels to match adjacent areas.

Patch repair and replacement are generally applicable to the defective Ceiling System. It involves the lowest extent of cost, time and manpower. However, patch repair is not the best solution because supplier or contractor would not provide any warranty or guarantee to the whole Ceiling System. Most importantly, the root cause of the defects might not be appropriately dealt with. Similar defects and damages might happen again in future.

Patch repair should be treated as the short-term remedial measure of the entire maintenance works. As the Ceiling System is a closed space design, missing ceiling panels would form gaps and reduce the effectiveness to withstand strong wind. The undermentioned approaches would spend much more time and it is not an easy way to solve the root cause. The Pacific Typhoon Season would approach in summer and there is an urgent need to replace and install new aluminum ceiling panels to seal the gaps.

To our understanding, the cost of patch repair would be less than HKD \$200,000.

- 2) Improvement works to enhance structural stability
 - a. Appoint Registered Structural Engineer (hereinafter referred to as 'RSE') to assess the ability of the Ceiling System to withstand strong wind
 - b. Propose improvement scheme to enhance the structural stability if deemed necessary.

Proper improvement works can enhance the Ceiling System to withstand strong wind. However, comparing with patch repair, this approach would be relatively more expansive and time-consuming, and also involve much more manpower. The RSE has to measure the size of the steel members, and destructive tests might be required to obtain structural information of the Ceiling System. Erection of scaffolding would be required for locations inaccessible by scissor platforms. All these would result in a high cost.

The consultancy fee for RSE assessment would be about HKD \$650,000 without laboratory testing. The estimated cost of RSE services with laboratory testing should be about HKD \$1,000,000. The cost of improvement works would be further assessed if deemed necessary and could not be estimated at this moment.

- 3) Full replacement

Appoint RSE to design a new Ceiling System to replace the existing one.

Full replacement is a long-lasting measure to deal with the root cause involving design stage and statutory submission & approval stage. Although this approach would incur the highest cost among the 3 approaches proposed, a new Ceiling System conforming the current requirements concludes the best solution in terms of durability and outlook. The total cost would constitute about HKD \$7,000,000 and below shows the tentative cost estimate.

Items	Area	Unit Rate	Amount	
a) Preliminaries			HKD\$	600,000
b) Demolition works	3800m ²	250/m ²	HKD\$	950,000
c) Full replacement works	3800m ²	1200/m ²	HKD\$	4,560,000
d) RSE consultancy fee			HKD\$	250,000
e) Contingencies @ 10%			HKD\$	636,000
Total :			HKD\$	6,996,000*

* The consultancy fee for project management is not included in the estimated cost for full replacement. It would be about HKD \$300,000.

8.0 CAVEATS

This report is confidential to the client for the specific purposes to which this report relates. No responsibility is accepted to other parties for the whole or any part of its context;

Our survey was based on visual inspection with no detail measurement or destructive test carried out. Although we have carried out a visual inspection to the concerning area in the Development as stipulated in previous part of this report, we are unable to report, nor be responsible for, any sealed or covered or inaccessible area where there are some defects; and

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For and On Behalf of
Savills Project Consultancy Limited



Chan Wing Lung, Wayne
Director

BA(AS), MArch, FSERA, RA, HKIA, AP, RI,
BEAM Pro, VBAS Assessor (List 1)

-- THE END --

Location	:	T1 & T2 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 21 March, 2019 & 22 March 2019		



Photo No. A1 | Access point 1



Photo No. A2 | General view



Photo No. A3 | General view



Photo No. A4 | Bracket connecting grid and access panel was rusty.



Photo No. A5 | General view



Photo No. A6 | Damaged ceiling panels forming gap.

Location	:	T1 & T2 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 21 March, 2019 & 22 March 2019		



Photo No. A7 | General view



Photo No. A8 | Access point 2



Photo No. A9 | General view



Photo No. A10 | General view



Photo No. A11 | General view



Photo No. A12 | Bracket connecting grid and access panel was rusty.

Location	:	T1 & T2 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 21 March, 2019 & 22 March 2019		



Photo No. A13 | Damaged ceiling panels forming gap.



Photo No. A14 | Access point 3



Photo No. A15 | Bracket connecting grid and access panel was rusty.



Photo No. A16 | Welded joints were rusty.



Photo No. A17 | Welded joints were rusty.



Photo No. A18 | Unused materials were found on panels.

Location	:	T1 & T2 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 21 March, 2019 & 22 March 2019		



Photo No. A19 | Welded joints were rusty.



Photo No. A20 | Access point 4



Photo No. A21 | General view



Photo No. A22 | Bracket connecting grid and ceiling panel was rusty.



Photo No. A23 | General view



Photo No. A24 | Welded joints were rusty.

Location	:	T1 & T2 of the Belcher's	Date	:	21 March, 2019 & 22 March 2019
Subject	:	Photo Record of weatherproof external false ceiling system			



Photo No. A25 Bracket connecting grid and access panel was rusty.



Photo No. A26 General view



Photo No. A27 1 piece of ceiling panel was missing



Photo No. A28 Access point 5



Photo No. A29 Bracket connecting grid and access panel was rusty.



Photo No. A30 General view

Location	:	T1 & T2 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 21 March, 2019 & 22 March 2019		



Photo No. A31 | General view



Photo No. A32 | Hole was found on weld joint.



Photo No. A33 | General view



Photo No. A34 | Ceiling grid was rusty.



Photo No. A35 | Access point 6



Photo No. A36 | General view

Location	:	T1 & T2 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 21 March, 2019 & 22 March 2019		



Photo No. A37 | Bracket connecting grid and ceiling panel was rusty.



Photo No. A38 | General view



Photo No. A39 | General view



Photo No. A40 | Bracket connecting grid and access panel was rusty.



Photo No. A41 | 1 piece of ceiling panel was missing.



Photo No. A42 | Access point 7

Location	:	T1 & T2 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 21 March, 2019 & 22 March 2019		



Photo No. A43 | General view



Photo No. A44 | General view



Photo No. A45 | Bracket connecting grid and access panel was rusty.



Photo No. A46 | Screw was rusty.



Photo No. A47 | Area inaccessible by scissor platform



Photo No. A48 | 2 pieces of ceiling panels were missing.

Location	:	T1 & T2 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 21 March, 2019 & 22 March 2019		



Photo No. A49 | Area inaccessible by scissor platform



Photo No. A50 | 1 piece of ceiling panel was missing.



Photo No. A51 | Area inaccessible by scissor platform



Photo No. A52 | Area inaccessible by scissor platform

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B1 | Access point 1



Photo No. B2 | General view.



Photo No. B3 | General view.

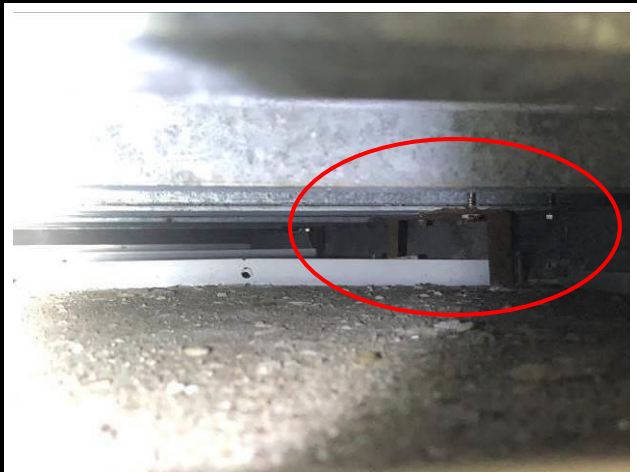


Photo No. B4 | Bracket connecting grid and access panel was rusty.



Photo No. B5 | Bracket connecting grid and access panel was rusty.



Photo No. B6 | Bracket connecting grid and ceiling panel was rusty.

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B7 | General view.



Photo No. B8 | General view.



Photo No. B9 | Access point 2



Photo No. B10 | General view.



Photo No. B11 | General view.



Photo No. B12 | Ceiling grid was rusty.

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		

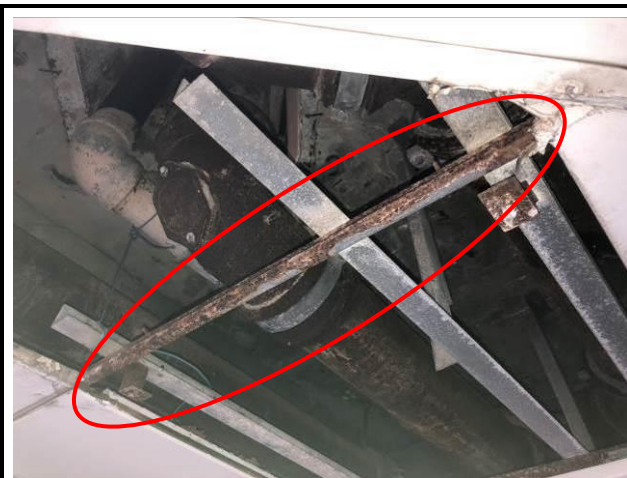


Photo No. B13 Ceiling grid was rusty.



Photo No. B14 a) Ceiling grid was rusty.
b) Bracket connecting grid and access panel was rusty.



Photo No. B15 Ceiling grid was rusty.



Photo No. B16 2 pieces of ceiling panel were missing



Photo No. B17 Access point 3



Photo No. B18 General view.

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B19 Welded joints were rusty.



Photo No. B20 Brackets connecting grid and ceiling panel were rusty.



Photo No. B21 General view



Photo No. B22 Washer plate was rusty.



Photo No. B23 Bracket connecting grid and access panel was rusty.



Photo No. B24 Access point 4

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B25 | Welded joints were rusty.



Photo No. B26 | Welded joints were rusty.

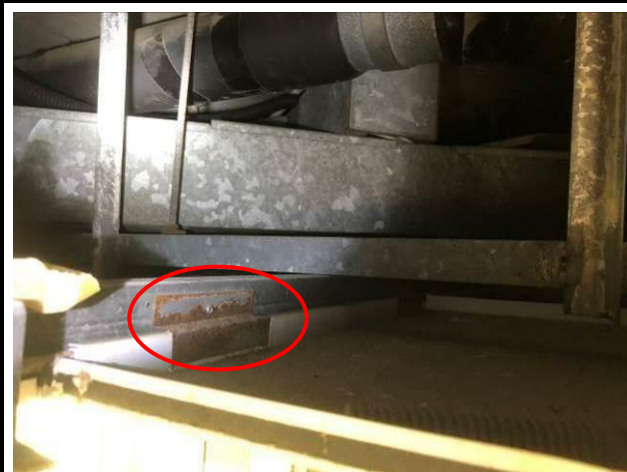


Photo No. B27 | Bracket connecting grid and ceiling panel was rusty.



Photo No. B28 | Screws were rusty



Photo No. B29 | a) Edge of GMS post was rusty.
b) Welded joints were rusty.



Photo No. B30 | 1 piece of ceiling panel was missing

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B31 | Access point 5



Photo No. B32 | General view



Photo No. B33 | General view



Photo No. B34 | Bracket connecting grid and access panel was rusty.

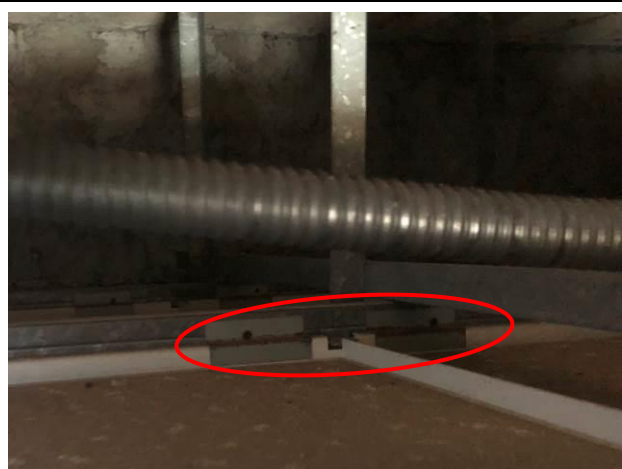


Photo No. B35 | Brackets connecting grid and ceiling panel were rusty.



Photo No. B36 | Ceiling grid was rusty.

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B37 | Ceiling grid was rusty.



Photo No. B38 | Access point 6



Photo No. B39 | Ceiling grids were damaged with screws remaining.



Photo No. B40 | Ceiling grids were damaged with screws remaining.

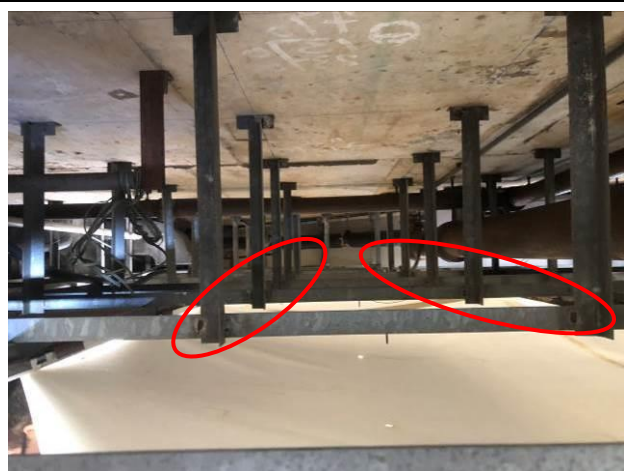


Photo No. B41 | Welded joints were rusty.



Photo No. B42 | Ceiling grid was rusty.

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B43 Welded joints were rusty.



Photo No. B44 Brackets connecting grid and ceiling panel were rusty.



Photo No. B45 General view



Photo No. B46 a) Bolt was rusty.
b) Edge of GMS plate was rusty.



Photo No. B47 45 pieces of ceiling panel were missing.



Photo No. B48 1 piece of ceiling panel was missing.

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B49 | 2 pieces of ceiling panel were missing.



Photo No. B50 | Access point 7



Photo No. B51 | General view

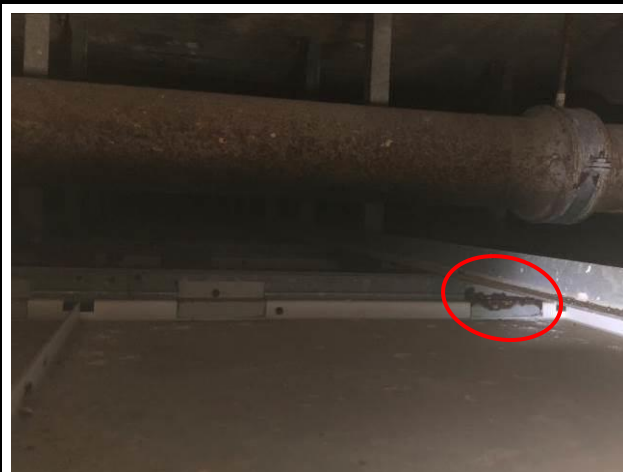


Photo No. B52 | Bracket connecting grid and ceiling panel was rusty.



Photo No. B53 | Welded joints were rusty.



Photo No. B54 | 5 pieces of ceiling panel were missing.

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B55 | 2 pieces of ceiling panel were missing.



Photo No. B56 | Access point 8



Photo No. B57 | Debris was found on ceiling panels.



Photo No. B58 | Ceiling grid and bracket were rusty.



Photo No. B59 | Ceiling grid was inclined and rusty.



Photo No. B60 | Access point 9

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B61 | General view



Photo No. B62 | General view



Photo No. B63 | General view



Photo No. B64 | Bracket connecting grid and access panel was rusty.



Photo No. B65 | Area inaccessible scissor platform



Photo No. B66 | 1 piece of ceiling panel was missing.

Location	:	T3 & T5 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019 & 21 March 2019		



Photo No. B67 | Area inaccessible area scissor platform



Photo No. B68 | 2 pieces of ceiling panel were missing.



Photo No. B69 | 3 pieces of ceiling panel were missing.



Photo No. B70 | Area inaccessible area scissor platform.

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019		



Photo No. C1 | Access point 1



Photo No. C2 | General view



Photo No. C3 | General view



Photo No. C4 | General view



Photo No. C5 | Bracket connecting grid and ceiling panel was rusty.



Photo No. C6 | Edge of GMS plate was rusty

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
		Date : 15 March, 2019



Photo No. C7 | Bracket connecting grid and access panel was rusty.



Photo No. C8 | Access point 2



Photo No. C9 | General view



Photo No. C10 | Debris was found on panels.



Photo No. C11 | Debris was found on panels.



Photo No. C12 | Welded joints were rusty.

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019		



Photo No. C13 Bracket connecting grid and access panel was rusty.



Photo No. C14 2 pieces of ceiling panels were missing.



Photo No. C15 Access point 3



Photo No. C16 General view



Photo No. C17 General view



Photo No. C18 General view

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019		



Photo No. C19 Bracket connecting grid and access panel was rusty.



Photo No. C20 Access point 4

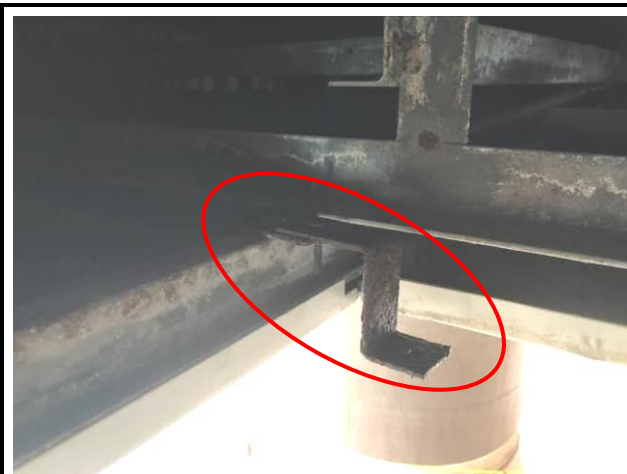


Photo No. C21 Bracket connecting grid and access panel was rusty.



Photo No. C22 Debris/ unused materials were found on panels.



Photo No. C23 Bracket connecting grid and ceiling panel was rusty.



Photo No. C24 GMS plates were rusty.

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019		



Photo No. C25 General view



Photo No. C26 a) GMS plate was rusty.
b) Screws were missed.



Photo No. C27 4 pieces of ceiling panels were missing.



Photo No. C28 1 piece of ceiling panel was missing.



Photo No. C29 13 pieces of ceiling panel were missing and the surrounding panels were loosening.



Photo No. C30 Access point 5

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019		



Photo No. C31 | Ceiling grid was discrete.



Photo No. C32 | Ceiling grids were discrete.



Photo No. C33 | a) GMS plate was rusty.
b) Bolt was rusty.



Photo No. C34 | Brackets connecting grid and access panel/ panels were rusty and corroded.



Photo No. C35 | General view



Photo No. C36 | Access point 6

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019		



Photo No. C37 | Debris was found on panels.



Photo No. C38 | Ceiling grid was rusty.

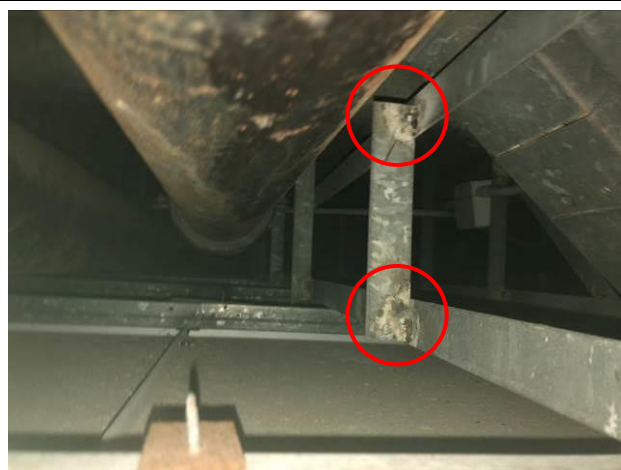


Photo No. C39 | Welded joints were rusty.



Photo No. C40 | Brackets connecting grid and access panel were rusty.



Photo No. C41 | 1 piece of ceiling panel was missing.



Photo No. C42 | 3 pieces of ceiling panels were missing.

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019		



Photo No. C43 | 6 pieces of ceiling panels were missing.



Photo No. C44 | 1 piece of ceiling panel was missing.



Photo No. C45 | Access point 7



Photo No. C46 | General view



Photo No. C47 | Bracket connecting grid and ceiling panel was rusty.



Photo No. C48 | Bracket connecting grid and access panel was rusty.

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
		Date : 15 March, 2019



Photo No. C49 | Ceiling grid was rusty.



Photo No. C50 | 4 pieces of ceiling panels were missing.



Photo No. C51 | Access point 8



Photo No. C52 | General view



Photo No. C53 | Welded joints were rusty.



Photo No. C54 | Brackets connecting grid and ceiling panel were rusty.

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019		



Photo No. C55 Bracket connecting grid and access panel was rusty.



Photo No. C56 Access point 9



Photo No. C57 Unused materials were found on panels.



Photo No. C58 Bracket connecting grid and access panel and screws were rusty.



Photo No. C59 Ceiling grid was rusty.



Photo No. C60 Access point 10

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019		



Photo No. C61 | General view.



Photo No. C62 | General view.



Photo No. C63 | Bracket connecting grid and access panel was rusty.



Photo No. C64 | Bracket connecting grid and access panel and screw were rusty.



Photo No. C65 | Bracket connecting grid and access panel and screw were rusty.



Photo No. C66 | Area inaccessible area scissor platform.

Location	:	T6 & T8 of the Belcher's
Subject	:	Photo Record of weatherproof external false ceiling system
Date : 15 March, 2019		

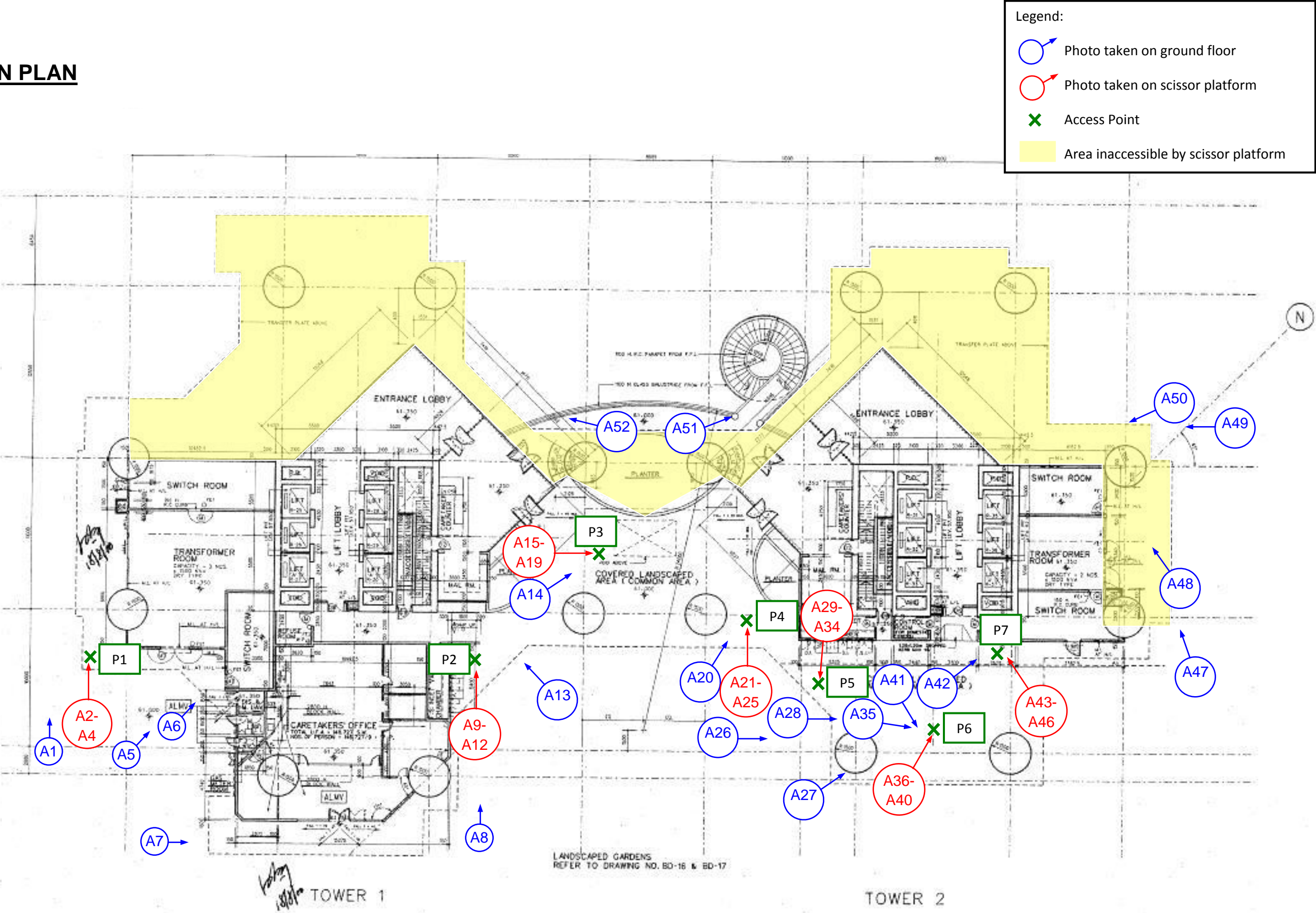


Photo No. C67 General view.



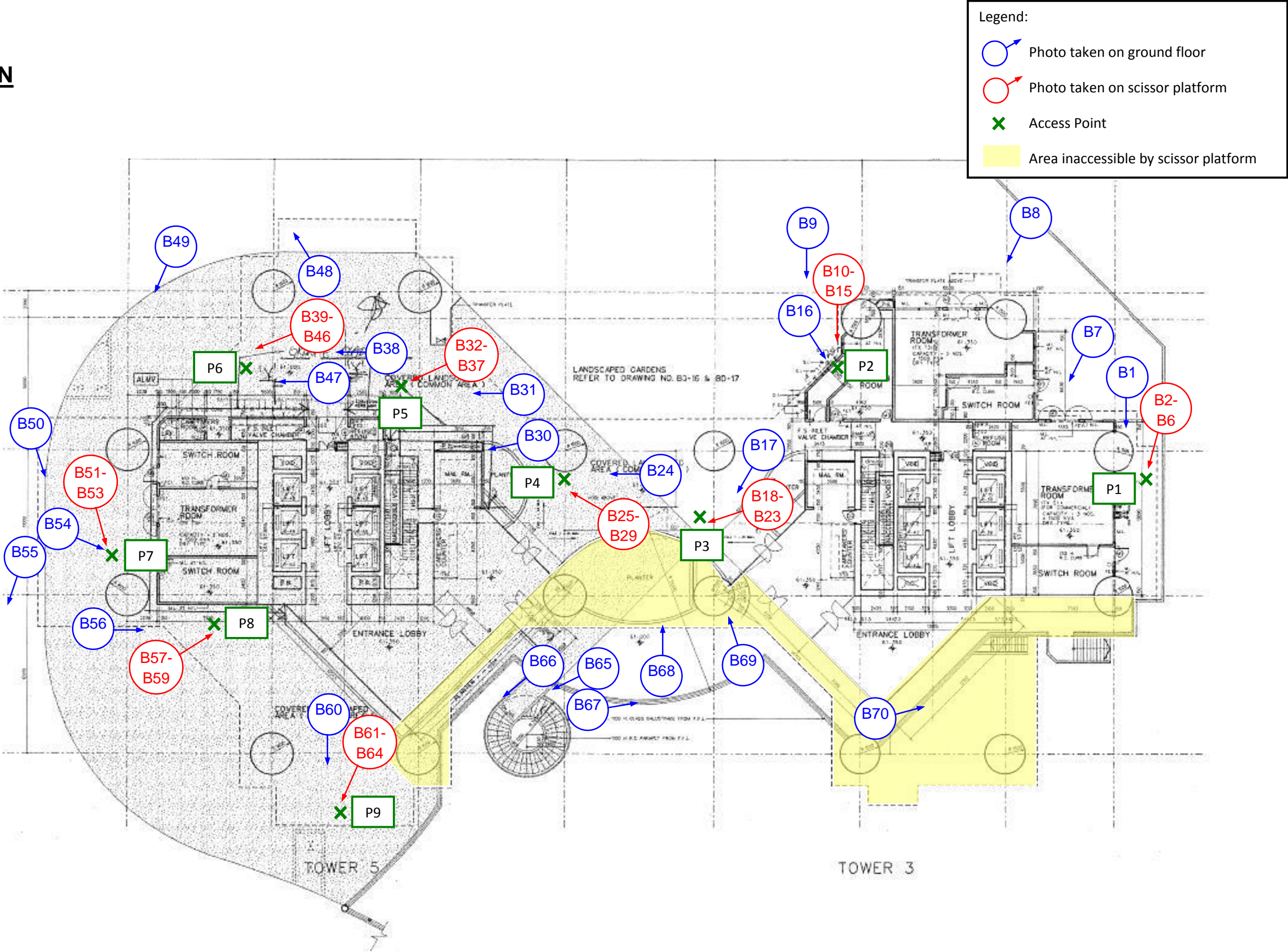
Photo No. C68 Damaged ceiling panel forming gap.

LOCATION PLAN



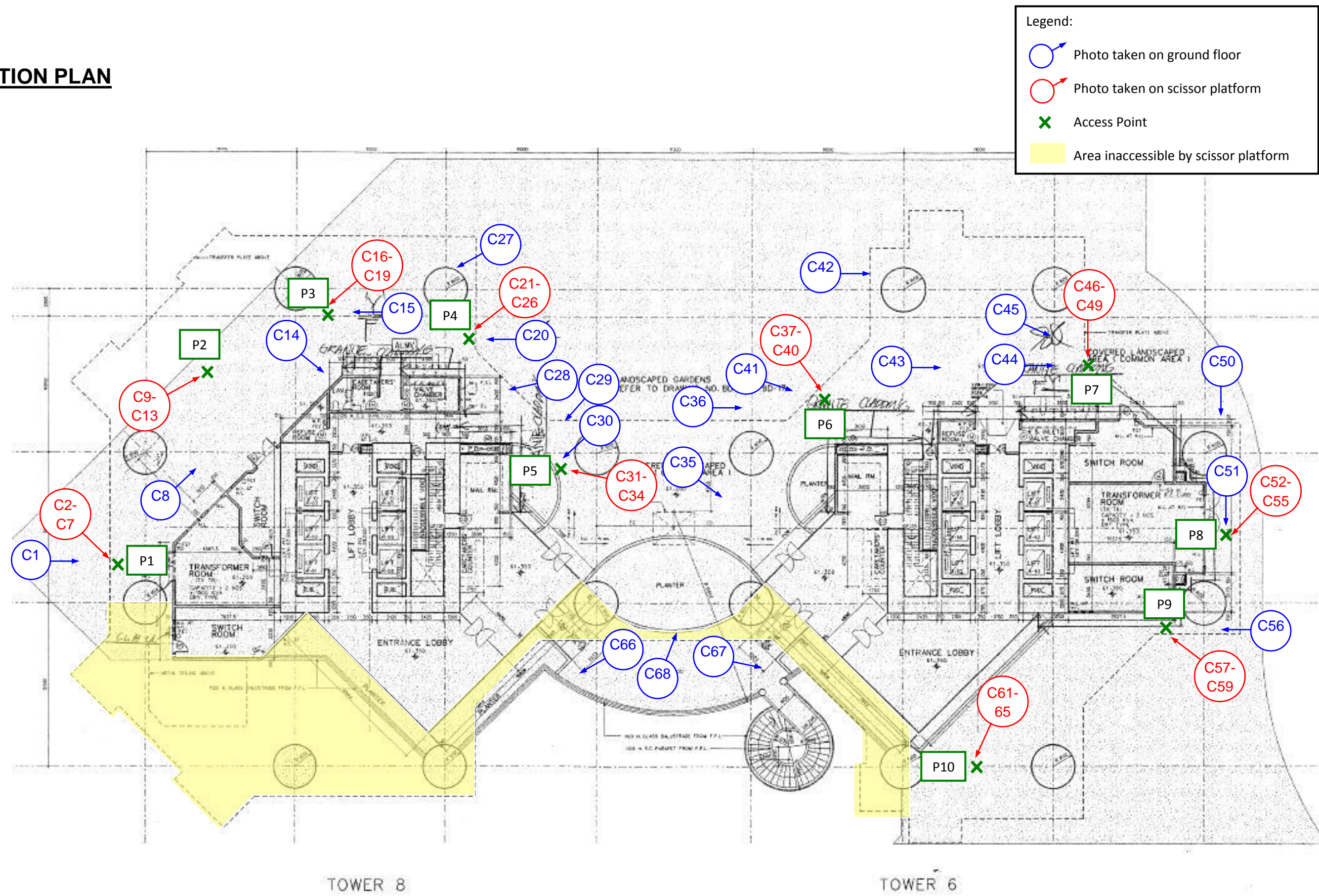
Location plan – Weatherproof external false ceiling system on Podium Level of T1 & T2, the Belcher’s

LOCATION PLAN



Location plan – Weatherproof external false ceiling system on Podium Level of T3 & T5, the Belcher's

LOCATION PLAN



Location plan – Weatherproof external false ceiling system on Podium Level of T6 & T8, the Belcher’s