

IN THE GRENFELL TOWER PUBLIC INQUIRY

THE INQUIRY RULES 2006, RULE 9

**SECOND WITNESS STATEMENT OF
GRANVILLE PARTLOW**

I, **GRANVILLE PARTLOW**, will say as follows:

1. My name is Granville Partlow. I made my first witness statement to the Inquiry on 28th September 2018. In that statement, I provided information about my background, qualifications and explained my involvement on behalf of PSB UK Limited (“**PSB**”) in the testing and commissioning of the smoke control system installed in Grenfell Tower in 2016 (“**the System**”). At the time of making that statement I had access to PSB’s documents only. Since then, I have been able to refer to many more documents made available by the Grenfell Tower Inquiry (“**the Inquiry**”).
2. I have been asked whether there is anything in my first statement that I wish to correct or any matter that I should want to clarify, or whether there is any further information I should want to provide to the Inquiry. I address these and other specific matters that I have been asked about in this my second statement.
3. References to the ‘common lobby door’ in this statement and my first statement relate to the door between the common lobby area and the stair, which could also be described as the stair door.

Commissioning the Smoke Control System at Grenfell Tower

Terminology of “Commissioning”

4. In paragraph 13 of my first statement, I said that I attended Grenfell Tower to “commission” the System on dates between February and April 2016. I now appreciate that the word “commissioning” may have different meanings to different people. I used

the word to encompass all of my activities on site associated with testing and commissioning the System.

5. As I was asked to attend site to check and test components of the System on numerous occasions as it was being installed, it may help to clarify my use of the word “commissioning” in my first statement.
6. My visits to Grenfell Tower in February 2016 were to check the progress of the installation of the System and, where possible, test the functionality of the components which had been installed. I was not “commissioning” (in the strict sense) the System in line with the performance criteria at this stage. Obviously, I could not confirm that it was a viable system until construction was complete.
7. There was value in these visits because I was able to take preliminary readings to help me confirm that the installation of the System was heading in the right direction and to identify any issues with the installation. Any issues which were identified could be rectified in preparation for the final commissioning exercise.
8. My interim report of 28th February 2016 {PSB00001257} was provided to assist JS Wright in showing their client that progress had been made. However, this report was not intended to be used as evidence that the System was fully or partially “commissioned”. The report just demonstrated that certain elements of the System had been tested and were working, rather than being able to say they were commissioned. I included the following comments to make the limitations of my report clear:

“This is not a full commissioning report it covers floors 4-23 only. To complete the commissioning floors ground to 3 will need to have all builders works complete including doors fitted and vent shafts sealed. Volumetric readings can only be taken when all builders works are complete.”

9. I am sure that JS Wright understood that the commissioning of the whole System had not happened and could not take place until all the building work which affected the System had been completed.

Preparations for Commissioning – Documentation and Equipment

10. In paragraph 19 of my first statement, I refer to being provided with the “PSB Commissioning Method Statement and Risk Assessment 75019AG” {PSB00000941}.

11. The circumstances in which this document came to be produced are explained in email exchanges provided to the Inquiry. It was produced by me at a busy time. It contains errors and does not accurately reflect the System.
12. The Method Statement outlines the safety procedures to be followed on site and provides some other relevant information.
13. None of the inadequacies in the Method Statement hindered my understanding of the System or what I was required to do in undertaking the commissioning exercise on site.
14. In paragraphs 20 to 23 of my first statement I list the documents that I had available to me when the commissioning work was undertaken. The Technical Submission **{PSB00000214}** provides information about the performance criteria of the System. I used these documents as my reference guides when undertaking the commissioning exercise not the Method Statement.

The Environmental Fan Inverter

15. At paragraph 30 of my first statement, I stated that the inverter panel for the environmental fan was not installed when I first visited Grenfell Tower.
16. To provide some further information in relation that matter, during my visits to the tower between 14th and 17th March 2016 one of my tasks was to test the environmental fans. As a result of those tests, it came to light that the fan installed at mezzanine level was not attenuated and was extremely noisy when it activated.
17. I was involved in on site discussions with JS Wright about this issue. I helped to come up with a solution by recommending that they installed an inverter to the environmental fan in order to attenuate the noise generated when the fans were in operation. I understand that PSB subsequently provided this inverter. The installation of the inverter was not however undertaken by PSB. It would have been up to someone at Rydon/JS Wright to place an order for the additional component **{PSB00001072}**. I was not involved in the detail of this.

Open Door Velocity Readings

18. As I explained in paragraph 104 of my first statement, a minimum airflow velocity of 2.0m/s across the open common lobby door was a required design performance criteria

for the System's smoke control mode. This average figure was achieved on every floor during the commissioning process.

19. I have been asked to provide further details of the process by which I measured the open-door airflow velocity.
20. The open-door airflow velocity readings in smoke control mode were taken using an anemometer by taking a number of airflow readings, normally between 10 and 12, from different locations across and up and down the common lobby door on each floor. I made a note of the readings and used them to calculate the average reading for each door. I recorded the average readings in column 2 of the second page of the readings at **{PSB00000234}**.
21. I did not retain the 10 to 12 individual readings for each door as the average figure was the only one that had to be formally recorded for commissioning purposes. I normally dispose of my working notes a short time after a job has finished. After my work at Grenfell Tower had finished, but before the fire occurred, I disposed of my working notes which contained the individual readings for each door.

Open Door Force Readings

22. As part of my work at Grenfell Tower, I verified that the door opening force for each common lobby door did not exceed 100N while the System was operating in smoke control mode on that floor.
23. Prior to the final commissioning in April 2016, I did this by setting the pressure switches to the required level on each floor and judging the door opening force. This was based on my experience. The objective was to ensure that the common lobby door could be opened comfortably when the System was operating.
24. The process I followed on each floor was as follows. I started by setting the pressure switch to around 25Pa which meant the fans would ramp down to their 'low' speed. I would then check the pressure differential at the common lobby door using a pressure differential monitor. If the pressure at the door was too high (such that the door opening force would exceed 100N), I would adjust the fan speed settings so that the door could be comfortably opened (such that the door opening force would be below 100N) and check it again.

25. The pressure switch is the trigger used to identify the pressure differential between the lobby and the stair, which in turn sends a signal to the outstation on the relevant floor and thus to the main PLC to control the fan speed. It does not directly decide the level of force required to open the common lobby door, but the pressure differential between the lobby and the stair determines the door opening force. By controlling this pressure differential, you are able to ensure that the door opening force does not exceed 100N.
26. As stated at paragraph 109 of my first witness statement, the pressure sensors on all floors were set to between 18 and 25Pa. Setting the pressure sensors is a fine balancing act. Several factors can influence the level at which the pressure switch needs to be set, including the size and condition of the doors and any openings on each floor (such as letterboxes and lift doors).
27. From memory, during the final commissioning exercise, Alan Whyte of JS Wright obtained a spring balance device so that we could take and record the necessary door opening force readings. I myself did not keep any record of the readings that were taken, but I believe these were taken on 28th April 2016. I have since seen an email dated 4th May 2016 where Alan Whyte subsequently confirmed to RBKC building control that *"Pull strength required is between 65 & 80N dependant on existing door and closer"* **{JSW00006202}**.
28. I have been asked whether I took door opening force readings at each of the flat doors connecting to a common lobby. This was not part of my commissioning exercise. I don't think it was necessary for the System and in any event, it would not have been practical in a building that remained occupied with residents throughout. On a new-build project and depending on the system, this can be something that is included in a commissioning exercise.

HMI Panel

29. At paragraphs 120 to 128 of my first witness statement, I provided information about the HMI panel demonstration. I have been asked to provide further information about the process of commissioning the HMI panel.
30. Commissioning the HMI panel can be broken down into 4 main steps:

- a. Opening a damper on a certain floor and checking that the HMI screen is also reporting that this damper is open.
 - b. Turning the key on the fireman's override switch on a certain floor and closing/opening the dampers and checking that this is reflected on the HMI screen.
 - c. Using the HMI to tell the System to move to operate on the next floor up. The HMI should show you that the dampers are open on the next floor up. You also need to manually check that this is the case on the floor in question.
 - d. In relation to fault signals, we would test the connectivity to the outstation cards and check that, if a connection to a card was lost, the HMI panel would report this fault and state that PSB should be contacted for further advice.
31. All these steps were undertaken during the commissioning process.
32. The HMI panel was also regularly checked throughout the commissioning process to ensure that the display on the panel reflected what was being tested elsewhere on the System. The need for checks to be undertaken at the HMI panel and on each floor at the same time is one of the main reasons why commissioning a smoke control system is a 2 person job. Someone needs to be checking what is happening on each individual floor, and someone else needs to be checking that this is reflected in what the HMI panel says.

Mezzanine Level Ductwork

33. I have been asked to provide further information about the commissioning process that I undertook in relation to the ductwork on the mezzanine level.
34. At the time we completed the checks on the mezzanine level ductwork there was scaffolding off the mezzanine corridor. This meant that we were able to access the ductwork, remove the inspection hatches and visually check the dampers.
35. We checked whether the fans were in the correct flow direction and that, when they were running, they were rotating.
36. We checked that the dampers were operating correctly in smoke control and environmental modes.

37. These checks having been performed, we were satisfied that the dampers and fans were connected and activating correctly in the different modes. I would have known if there were any subsequent problems with the fans as, when I was commissioning the System, I would not have been able to get the correct readings if these components had not been working properly.

Shut Off Dampers

38. I have been asked about damper “CD04” located in the ductwork at mezzanine level and which was referred to in the Above Ground Commissioning Report {PSB00000224}.
39. In paragraphs 143 to 145 of my first witness statement, I explained how the SD and CD designations in the Above Ground Commissioning Report related to (respectively) the lobby dampers and shut off dampers used in the System.
40. “CD04” was one of the shut off dampers in the ductwork at mezzanine level. This damper was not connected to the System. It was permanently open because PSB’s design only called for 3 dampers at this level (not the 4 installed), so this damper was effectively redundant. This was not an error in commissioning and did not have had any adverse effect on the operation of the System.
41. I have also been asked about a shut off damper that was not installed as part of the system by JS Wright, but which had been included on the E-800 drawing {PSB00000247}.
42. If my memory serves me correctly, I recall hearing about an issue with a damper located in the roof top plant room.
43. To the best of my recollection, JS Wright was not able to remove the pre-existing damper which meant that there was not enough room for a new damper to be fitted. As a result, the pre-existing damper was left in place and bolted into an open position.
44. The fans were mounted above this pre-existing damper and went to the discharge plenum on the roof, with permanently open penthouse louvres around it. As such, it had no adverse effect on the operation of the System.

Triggering of the System in April 2016

45. It is not mentioned in my first statement but, for the sake of completeness, there was an incident in early April 2016 when the System was triggered. As a result, the Building Management System located in the basement shut down the boilers in the building.
46. I recall being contacted by one of Rydon's site staff to ask what to do. I asked him which sensor had been triggered and told him to check the panel for any loose wiring. I cannot recall if any wiring was loose, but I believe I explained how to reset the System. I was not asked to attend site before I returned to complete the commissioning exercise between 26th and 28th April 2016.

System Demonstration

47. At paragraph 113 of my first witness statement I stated that, to the best of my recollection, the following people were present at the demonstration on 28 April 2016: Alan Whyte, representatives of Rydon, 2 people from the London Fire Brigade, someone from the management company, and at least 1 Building Control Officer. Having had the benefit of reading JS Wright's documents (in particular **{JSW00005613}** and **{JSW00001892}**) I now consider that the attendees were more likely to have been Alan Whyte (JS Wright), Dave Hughes (Rydon), Matt Smith (Max Fordham) and representatives from the London Fire Brigade.
48. I also recall at some point providing a demonstration to staff from KCTMO who would be responsible for testing the System. As part of that demonstration, I:
- a. Replicated the effect of a fire on the ground floor and a failure of the primary power supply whilst the System was still in fire mode, so that the System would change over to the secondary power supply and still operate (which it did).
 - b. Put the System into environmental mode and replicated a fire on another floor to test that the System operated on smoke control mode on the 'fire' floor (and that this operation was shown on the HMI Panel). This was done on for the ground floor and the plantroom on the roof.
 - c. Showed the attendees how to interpret the HMI and what to look for.
 - d. Explained the use of the screen and the override key in the HMI.

- e. Explained the passwords, the fault reports, and how to contact PSB if necessary.

Commissioning Certificate

49. At paragraph 147 of my first witness statement, I stated that I signed the completion certificate on 3 May 2016 {PSB00001258}.
50. After reviewing the documents again, I can see that it was David Harrison of PSB that signed off the completion certificate not me. The commissioning engineer would normally sign off the commissioning report, which I did.
51. I understand that this statement will form part of the evidence before the Inquiry and will be published on the Inquiry's website.

STATEMENT OF TRUTH

I believe the facts stated in this statement are true.

Granville Partlow



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Dated

26/03/2021
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