AFFIDAVIT OF IGOR BIENSTOCK

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

Igor Bienstock, being duly sworn, deposes and says:

Introduction:

My name is Igor Bienstock. I am a licensed professional engineer in the State of New York and engineer of record for the 36 West 66th Street project (the "Project"). I am a Senior Partner at ICOR Associates, LLC, an engineering consulting firm that designs building HVAC, electrical, plumbing and fire protection systems. Prior to joining ICOR, I was a Partner and Senior Vice President of Cosentini Associates, a 700-person MEP/FP engineering consulting firm headquartered in New York City. My design experience spans more than 40 years and includes work on many large, complex projects in New York City and across the world. I am thoroughly versed in the governing NYC Building Codes as well as design best-practices, which take into account constructability, operability, and equipment serviceability.

Section I – Omissions and Defects in the Michael Ambrosino Analysis:

I have reviewed the affidavit submitted by Michael Ambrosino, on behalf of Landmark West!, dated November 5th, 2019. In his affidavit, Mr. Ambrosino states that he performed an analysis of the mechanical rooms on Floors 15, 17, 18, and 19 by studying all "Mechanical, Electrical and Plumbing (MEP) drawings for the above project dated August 17, 2018 on file at the Department of Buildings" and calculating the percentage of floor area occupied by MEP systems based on this review. However, the diagrams prepared by Ambrosino are an annotated version of the mechanical ductwork plans that (a) fail to identify all of the equipment on those plans themselves; (b) do not reflect equipment shown on the *other* mechanical drawings; and (c) have a number of omissions and defects. These omissions and defects are described below.

1. Elements Omitted From The Mechanical Ductwork Plans

Mr. Ambrosino's analysis of the mechanical ductwork plans fails to account for various forms of equipment that are clearly shown on those plans. In particular, Mr. Ambrosino identified the footprints occupied by only some of the mechanical equipment and associated clearance areas. In doing so, he did not account for the following:

- Mechanical fans and heaters
- All mechanical shafts and chases
- All horizontal ductwork distribution and plenums

2. Other MEP Drawings Excluded From the Analysis

Moreover, in conducting his analysis, Mr. Ambrosino used as a base background the HVAC mechanical ductwork plans only (sheets M-216.00, M-220.00, M-221.00, and M-222.00). Accordingly, *none* of the equipment shown on the other three sets of MEP design drawings are accounted for in his analysis. Specifically, the drawings do not depict and his area calculations therefore do not include space occupied by the following systems and equipment:

- Mechanical piping (M-316.00, M-319.00, M-320.00, M-321.00)
- Plumbing equipment and distribution (P-216.00, P-220.00, P-221.00, P-222.00)
- Fire sprinkler/standpipe equipment and distribution (SP/SD-216.00, SP/SD-220.00, SP/SD-222.00, SP/SD-224.00)

By using the mechanical ductwork plans only, the diagrams significantly understate the amount of mechanical equipment on each floor. A full and complete depiction of the Project mechanical equipment is shown on the architectural composite drawings submitted to the Board (sheets A-132.00, A-140.00, A-144.00, and A-148.00).[1]

Exhibit A includes a full set of the mechanical plans and composite drawings. Exhibit B includes blow-up excerpts from the composite drawing for each mechanical floor with a side-by-side comparison with the diagrams provided by Mr. Ambrosino. The comparison shows the extent to which the diagrams provided by Mr. Ambrosino understate the amount of mechanical equipment on each floor.

3. Other Omissions and Defects

Mr. Ambrosino's methodology has other omissions and defects as well. For example, he adopts the rigid methodology of the Department of Buildings' draft Mechanical Bulletin, which, as discussed in detail in the affidavit of Luigi Russo, does not provide a sufficient amount of space for circulation and to ensure that the ongoing maintenance and repair of each piece of equipment can be conducted safely and efficiently.

This failure to take account of the various types of mechanical ductwork, piping and shafts throughout the mechanical floors has two further implications which Mr. Ambrosino's work does not consider: First, there is a need for adjacent service areas to be provided for the horizontal connections. Second, the MEP drawings submitted to DOB for permitting purposes do not fully depict the actual dimensions of most of these pipes, ducts and other connections. Instead, the MEP drawings typically indicate these with a single or double line. When shop drawings are prepared, these connections are confirmed, their actual dimensions are depicted, and the space fills out considerably.

[1] The composite architectural drawings also include the following additional elements: swimming pool equipment, IT/telecom infrastructure equipment, and electrical equipment.

Section II – Michael Ambrosino Affidavit - Alternate 17th Floor Layout

In Mr. Ambrosino's affidavit, he provides a proposed alternate layout for the 17th floor mechanical room, seemingly in order to demonstrate how the equipment on this floor could have been designed to occupy a smaller footprint. The layout provided, however, is clearly not a complete engineering plan. It only accounts for the footprint of select floor mounted HVAC equipment (the diagrams highlight nine pieces of equipment on the western portion of the floor although only eight pieces are shown relocated in the "consolidated" layout), and is not one that could realistically be installed or operable, for many reasons, including but not limited to the following:

- The proposed layout does not include all of the equipment shown on the mechanical ductwork plans, notably as follows:
    - Expansion tanks and air separators
    - Pumps
    - Water Source Heat Pumps
    - Fans
    - VFDs and control panels

- The proposed layout does not include all of the additional categories of equipment shown on the plans he did not review, as listed above (HVAC mechanical piping, fire protection and plumbing).
- The proposed layout does not show, nor does it provide space for the necessary piping and ductwork distribution that connects to the HVAC equipment or space to access the valves and gauges attached to the distribution.
- Were it to take into account the various omitted pieces of equipment, the proposed layout would not allow for walking aisles or adequate means to access equipment.

Even assuming the nine particular pieces of equipment Mr. Ambrosino focuses on could be moved as shown on his drawing (which they could not), there are additional pieces of equipment located on the western portion of the floor—fans and air handling units—that require proximity to air intake and exhaust louvers present only on that side of the floor and which therefore could not be relocated. Further, the western portion of the floor includes horizontal connections throughout. Accordingly, moving the nine pieces of equipment would not empty the western portion of the floor, as Mr. Ambrosino's overly simplistic diagram purports to illustrate.

Moreover, Mr. Ambrosino's alternative layout is based on the false premise that having equipment occupy the minimum amount of space on a floor equates to mechanical efficiency. When designing a full building, however, there are a host of considerations an engineer must take into account, including accessibility, constructability, and proximity of equipment and systems to the occupied spaces they serve. Other considerations include the effect of location on individual system parameters, such as voltage drops and operating pressures, as well as the required separation between specific systems, proximity to exterior walls for air intake and exhaust, etc.

For example, much of the distribution system within these floors (an element of the mechanical program which Mr. Ambrosino has ignored altogether) is routed based on the layouts of the

occupied spaces they serve above and below; that is, ductwork, piping, and conduits must distribute from the specific equipment within the machine rooms to shaft locations that correspond to and serve the apartment floor layouts they feed.

Section III – Considerations Governing the ICOR Mechanical Room Layouts

Below is a description of all systems designed for the four interstitial mechanical floors, with general explanations of why they are located on a particular floor and considerations governing the layout on the individual floors.

Several preliminary observations are in order:

It is important to note that, as a luxury residential condominium, the mechanical equipment has a number of features not found, for example, in a rental building. These pieces of equipment include:

- Chilled water system for the Tower portion of the building that requires additional pumps, chillers, heat exchangers, accessories and appurtenances;
- Full redundancy on all water side equipment;
- Electrical substations throughout the tower, which require additional electrical gear on the mechanical floors but allows us to distribute vertically at higher voltage, thereby drastically reducing the amount of conduits and wiring needed throughout the other floors;
- Humidification equipment for apartment makeup air units; and
- Waterside economizer system.

A. 15th floor MER:

The 15th Floor houses mechanical equipment that serves the podium level residential units (Floors 2 to 14). Equipment is strategically located on this level to minimize distribution required to serve the apartments directly below. This floor also houses electrical and plumbing equipment/systems that serve the entire building.

1. MEP Room #1 (Northwest corner) – Houses the AC unit to provide temperature control to the electrical equipment which is located in the Electrical Room #2. Equipment is located here for its adjacency to the room it serves.

2. Electrical Room #1 – Houses IT and technology equipment that connects upper building technology systems with the lower half.

3. Electrical Room #2 – Houses ATS switches, transformers and electrical distribution panels. Electrical equipment located in this room provides emergency power to the elevator equipment located on floors above the 16th floor and roof, residential units, and mechanical equipment requiring emergency power by code. It is located here for proximity to the emergency generator. This electrical room was located here for its close proximity to the shaft carrying emergency risers to serve the floors above.

4. Electrical Room #3 – This room houses transformers and electrical distribution panels. Equipment located in this room provides power to mechanical equipment, pool equipment located on this floor as well as the mechanical equipment located on the 16th floor. This electrical room was located here for its close proximity to the shaft carrying emergency risers to serve the floors above.

5. MEP Room #2 (Northeast corner) – This room houses an AC unit to provide temperature control to electrical equipment located in the Electrical Room #3. Equipment is located here for its adjacency to the room it serves.

6. Storm Water Detention Tank Room – This room contains a tank, required by code, that collects rain water from 16th floor terrace, loggias at the apartments above, as well as the main roof. The tank is located below these exterior spaces in order to collect storm water by gravity. This room is centralized on the floor to efficiently collect from all the storm water risers from above.

7. Pool Equipment Room – This room houses the equipment (pumps, filters, chemical storage etc.) that serves the outdoor pool located at the 16th floor directly above. This room is located here as it is directly beneath the 16th floor pool.

8. Mechanical Room #1 – This room houses the air handling unit that provides ventilation to the residential corridors below. It is located at this level because it serves the residential units directly below. Its location on the floor must be proximate to intake and exhaust louvers, which are on the southern and eastern façades. Moreover, this is a large piece of equipment and required space to house this equipment was only available along the east side of the mechanical room. This room also contains exhaust and supply fans that serve the apartment levels below, as well as the ventilation requirements of other rooms on this floor. Fans are similarly located here for proximity to exterior louvers, to minimize required ductwork distribution.

9. Generator Room – This room houses a generator to serve the building. The generator is located at this level because it requires intake and exhaust air for ventilation. The louvers are only available at this level. This unit was centralized in plan to allow generator to be located close to both the intake and exhaust louvers, and minimize fuel oil piping and electrical feeders distributing to and from the generator.

10. Mechanical Room #2 – This room houses the air handling unit that provides code required ventilation to the residential apartments below. It is located at this level because it serves the residential apartments directly below, and is required to be proximate to intake and exhaust louvers located on the southern facade. This room also contains a steam generator that provides humidification for this air handler. Moreover, this is large piece of equipment and required space to house this equipment that was not limited by structure.

B. <u>17th floor MER:</u>

This floor houses the central heating plant for the entire building. Heating and hot water distribution equipment is strategically located at this floor because it is centralized vertically in the building and the heating equipment serves apartments both below and above this floor.

1. Mechanical Room #1 – This room houses an air handling unit and return air fan that serve the amenity spaces on the 16th floor directly below. This location was selected as it is directly above the space it serves, to minimize required ductwork distribution. This MER also houses lighting controls and electrical panels.

2. Boiler Room– This room houses boilers that produce all heat for building heating and domestic hot water. This room also houses fans for boiler room ventilation and elevator shaft pressurization as well as air conditioning units to serve the MER. The boiler plant was located at this level (mid-level of the building) for efficient and cost-effective hot water distribution system. A fan coil unit serving the adjacent electrical room is also located in this room. The boiler room was placed on the east side of this floorplate as the boilers must be near an air intake louver for combustion air. An intake louver is located at the southeast corner of the floor.

3. Electrical Room – This room houses electric panels that serve elevator equipment on the 16th floor and mechanical equipment on 17th floor. The electrical room was located at this level to feed high voltage power via a minimal run of conduits in lieu of individual feeders for each piece of equipment from the transformers located at the 19th floor MER. This will reduce the amount of conduit runs for this level to the mechanical rooms.

4. Mechanical Room #2 – This room houses multiple sets of hot water pumps, hot water heat exchangers, hydronic accessories such as expansion tanks, chemical treatment tanks, and VFDs controllers. These serve multiple primary, secondary, and domestic hot water systems for the building. This room also houses various fans that provide required ventilation to mechanical rooms on this floor. Pumps were placed along the west side as larger mechanical space is required for the all the pumps, heat exchangers as well as hydronic accessories.

C. 18th floor MER:

This floor houses the central condenser water plant that serves all building cooling needs as well as a central chiller plant that specifically serves the tower apartments above. The cooling plant was located on this level specifically to limit the operating water pressures in the various water loops that circulate from both above and below to manageable levels. The chiller plant was also located at this level to be closer to the tower residential levels it serves.

1. Electrical Room – The electrical room houses transformers as well as electrical distribution panels to serve the mechanical equipment on the 18th floor. An AC unit to

control temperature is also located in this room. It is centralized on the floor plan to optimize the distribution to all equipment on the floor surrounding it.

2. Mechanical Room #1 – This room houses (18) water cooled chillers, primary and secondary chilled water pumps, secondary condenser water pumps, hydronic accessories such as expansion tanks, air separators, VFDs to operate the pumps, air conditioning units for the MER, as well as various fans that provide required ventilation for the mechanical rooms and elevator shaft pressurization. The chillers, chilled water pumps, secondary condenser water pumps, and associated heat exchangers on this floor produce and circulate chilled water for the Tower Residential units above (20th through 37th floor) as well as air handling units located on the 16th and 17th floors. Another set of secondary condenser water pumps is located within this MER. These supply condenser water for equipment in the sub cellar, cellar, ground floor and the ground floor community facility. The location selected is the most efficient location in order to distribute to the chilled water pipe riser locations that are dictated by the apartment layouts on the floor above.

3. Mechanical Room #2 – This MER houses plate and frame heat exchangers. Heat exchangers are utilized to isolate condenser water from the cooling tower from the condenser water that is circulated through the building equipment. These heat exchangers are also located on this level to provide a necessary pressure break so that equipment on the secondary side of the heat exchangers can operate at manageable operating pressures. This room is centered between the primary condenser water pumps and secondary water pumps to minimize piping distribution on either side.

4. Mechanical Room #3 - This MER houses primary condenser water pumps, VFDs to operate the pumps, hydronic accessories (expansion tanks, chemical treatment tanks etc.). Primary condenser pumps are utilized to circulate condenser water through the cooling tower and the Plate and Frame Heat Exchangers located within Mechanical Room #2. Pumps were located here due to proximity to piping risers from above which feed them. This room also houses fans for MER ventilation, dryer exhaust, and air conditioning units to serve MER. Fans are located here as they are required to connect to an exhaust air louver, located at the northwest corner.

D. <u>19th floor MER:</u>

This floor houses Air Handling units that serve the tower residential units directly above (20th through 27th floors). Equipment is strategically located on this level to minimize distribution required to serve the apartments directly above. This floor also houses a smoke purge fan, electric substation, fire reserve tank, fire pumps, domestic hot water heaters, and fire protection equipment for the electrical room housing transformers.

1. Mechanical Room #1 – This floor houses a set of domestic hot water heaters and a PRV station that provides domestic water to 20th through 26th floors directly above. Water heaters were located on this floor so that proper water pressure can be maintained at

the plumbing fixtures on the floors they are serving. An air conditioning unit to serve the MER is also located in this room.

2. Mechanical Room #2 – This room houses two large energy recovery air handling units that serve tower residential floors directly above (20th through 27th). These units were located at this level as these units serves the residential floor directly above. One unit provides required make-up air to the residential units and the other air handling unit provides required ventilation air to the residential corridors. These units were located here as they require a large amount of intake air, and they are required to be adjacent to the intake air louver located at the southeast corner. The equipment also requires a large floor area, unobstructed by structure, due to their large footprints. The location is also the most efficient location for distribution ductwork from the units to the riser locations that are dictated by the apartment layouts on the floors above. This room also houses a steam generator provides humidification for the air handler. Smaller air conditioning unit serving the MER is also located in this room.

3. Water Reserve Storage Tank Room – This room houses the fire reserve tank. This tank contains required sprinkler/standpipe reserve water for floors below the 19th floor, as required by code. The fire reserve tank is located on this floor to maintain required pressure at the sprinkler heads and the standpipes located at the zones/floors below 19th floor.

4. Fire Pump Room – This room houses a fire pump to draw water from a fire reserve tank located on this floor to serve sprinkler/standpipe for floors below the 19th floor, as required by code. It is located here to be adjacent to the reserve tank it is connected to. An AC unit that serves the adjacent electrical room is also located in this room.

5. Electrical Room – This room houses main electric switchgear, transformers, and electrical distribution panels that serve all residential units on 20th through 39th floor and provide bulk power to the distribution panels on MERs at 17th, 18th & 19th floor. Transformers were located at this level as the transformers are closer to the tower residential floors above, and it minimizes the amount of conduits to be run vertically through floor below.

6. Mechanical Room #3 – This room houses a large post fire smoke exhaust fan required to serve the mechanical levels. It is located here so that it can be directly adjacent to the exhaust louver in the northwest corner to which it connects. There is another set of domestic hot water heaters and a PRV station that provides domestic water to 27th through 33rd floors above. Water heaters were located on this floor so that proper water pressure can be maintained at the plumbing fixtures. A specialty fire suppression system dedicated to the adjacent electrical room is also located in this room.

As demonstrated in this description, the layout of the mechanical equipment at the Project was guided in large part by the need for that equipment to be located in proximity to the areas it serves or in proximity to other types of equipment, among other factors related to operational and energy efficiency specific to the characteristics of this building. In my professional opinion, the

mechanical layouts for the Project reflect these and other relevant considerations in a manner consistent with sound engineering practice.

Igor Bienstock

Sworn to before me on
this 27th day of Nov., 2019

Notary Public

JORGE MELENDEZ
NOTARY PUBLIC
STATE OF NEW JERSEY
MY COMMISSION EXPIRES SEP. 29, 2021