SAA
Scottish Assessors Association

Revaluation 2023

Industrial Properties Committee

Practice Note 5
Valuation of Subjects Containing Clean Rooms

1.0 Introduction

1.1 This practice note applies to the valuation of subjects that contain areas of environmentally controlled space popularly referred to as “Clean Rooms”. Clean rooms exist where sensitivity to environmental contamination is an issue. Clean rooms are typically found in the semi-conductor, electronics, biotechnology and pharmaceutical industries, although they may also be encountered in other fields where sensitivity to environmental contamination is an issue.

2.0 Basis of Valuation

2.1 The basis of valuation is the comparative principle as it applies to industrial properties having regard to the costs associated with the provision of additional features necessary to create such subjects.

3.0 Clean Room Definition

3.1 Clean rooms are areas within properties where higher than normal environmental standards are maintained. A clean room may therefore be defined as an area with environmental control of particulate contamination (such as dust, airborne microbes, aerosol particles and chemical vapours), temperature and humidity constructed in such a way as to minimise the introduction, generation and retention of particles inside the room.

3.2 In terms of structure and internal finish, clean rooms can vary significantly depending on purpose and design. Indeed it is these variations that drive the various classifications set out later in this practice note. It is noted, however, that particularly in some less sophisticated industries the term “clean room” can be applied somewhat loosely to cover accommodation that amounts to little more than an air-conditioned room. For the sake of clarity, accommodation should only be considered suitable for valuation under the terms of this practice note if, in addition to the presence of environmental control, the accommodation is at the very least characterised by the presence of specialist or specifically adapted floor, wall and ceiling finishes.

4.0 Explanation of Terms

4.1 The following definitions will assist in understanding features commonly associated with clean rooms and their method of operation.

4.1.1 Laminar flow

This is the preferred method of air changing for higher specification clean rooms. Air flow can be either horizontal or vertical. In full laminar flow clean rooms, air enters the room through a batch of filters that comprise the whole of one wall or ceiling and leaves by corresponding ducts in the opposite wall or floor. It follows that for effective laminar flow to take place, there must be minimal interruption by pillars, protruding light fittings, inset windows, furniture etc. Vertical laminar flow is likely to be found in the most sophisticated clean rooms and is clearly superior as lateral contamination is minimised, air being admitted through ceiling filters and extracted through perforated floor tiles.

4.1.2 Conventional or turbulent flow

The air enters the room through a bank of filters positioned such that ducting after final filtration is minimal and leaves the room through outlets remote from the inlets.

4.1.3 Positive Air Pressure

Maintained to ensure that if there are any leaks (through door openings etc.) air leaks out of the chamber instead of unfiltered air coming in.

4.1.4 ULPA and HEPA filters

Abbreviations for Ultra-Low Penetration Air and High Efficiency Particulate Air filters that are the very high specification filters necessary to achieve the environmental standards within the clean rooms that they serve.

4.1.5 Air Lock

An enclosed area at the entrance or exit of a clean room forming a break between the ambient environment outside and the controlled environment inside the clean room. Often provides gowning and/or shoe change facilities.

4.1.6 Air shower

An enclosed area at the entrance of a clean room with air jets which remove loose particulate matter from personnel prior to entering the clean room.

4.1.7 **Clean workstation, laminar flow bench or cabinet**

These terms describe working enclosures that have their own filtered air or gas supply. These areas may have environmental standards much higher than the clean rooms in which they are located. Such facilities may in themselves be not rateable being self-contained items of plant <400m³.

5.0 Clean Room Classification

5.1 General

5.1.1 The term Clean Room is used to describe a wide range of accommodation varying from areas with simple air conditioning to the most sophisticated forms (exhibiting full laminar flow, air showers etc.).

5.1.2 **It cannot be emphasised too strongly that terms used within the industry to classify clean rooms do not, used in isolation, provide a reliable guide to valuation treatment.** The air-handling/ filtration plant in such facilities is generally non-rateable. In addition, industry classification will reflect a number of issues that are not attributable to the physical characteristics of the building (see Section 5.2 below). Nevertheless, such information can be an indicator of the structural standard of the facility as there is usually a correlation between the plant and the structure – the best air-handling being found in the best structures.

5.1.3 Clean rooms are classified within the industry according to the number and size of particles permitted per volume of air. This can be done according to USA Federal Standard 209E (where the classification is determined by measuring the number of particles >0.5 microns in one cubic foot of room air) or according to ISO 14644-1 which is based on volumes of air expressed in metric terms. ISO 14644-1 is an international standard adopted by the European Union in 1999 and the USA in 2001. This method of classification was intended to supersede USA Federal Standard 209E which was officially cancelled in 2001.USA Federal standard 209E does however continue to be the most widely recognised system for classification of clean rooms. Because 1 m^3 is about 35 ft^3, the two standards are mostly equivalent when measuring 0.5-micron particles, although the testing standards differ.

5.1.4 This Practice Note will refer to the US Fed standard 209E basis of classification in the descriptions that follow. Clean rooms are thus described as Class 1, Class 10 etc. - a Class 10 clean room for example having not more than 10 particles exceeding 0.5 microns in one cubic foot of air. The ISO 14644-1 classifications are however also provided for assistance.

5.1.5 It is not thought possible to operate a clean room better than Class 100 with human presence and any that do almost certainly require robot technology. It is unlikely that the rateable element of such superior facilities will be better, for reasons of environmental standards alone, than the specified Type 1 facility.

5.1.6 Clean room specifications are continually advancing and surveyors are advised to enquire of the service engineer/facilities manager at any property for the technical details of systems encountered.

5.2 **Critical criteria**

5.2.1 The standard of cleanliness achieved in any clean room depends on a number of factors that include.

1. The structural quality of the clean area and, in particular, of internal wall, floor and ceiling finishes.

2. The specification of the air filtration plant and equipment.

3. The control of access/egress to the area and personnel dressing disciplines.

4. The extent to which furnishings, fittings, equipment and materials stored within the area contaminate the environment or interfere with air flow.

5. The extent to which people and materials move within the area.

5.2.2 There is no single most important factor. All of these interact and in order to achieve the highest standards of cleanliness, strict attention requires to be paid to all of these areas. Obviously in terms of valuation for rating, however, it is not appropriate to take into account all of these factors.

5.2.3 It is not uncommon to find two clean rooms of identical natures, perhaps across a corridor from one another in the same property, operating at different cleanliness specifications. This may, for example, be due to different access disciplines on account of process requirements. The environmental standard alone is therefore not a safe guide to value, which should always be based on the (rateable) structural standard of the facility. In this example, the clean rooms should have the same value.

6.0 Clean Room Classifications

6.1 Clean Rooms can take many structural forms and in order to simplify matters for valuation purposes this report recognises three principal types.

6.1.1 **Type 1**

Feature	Details
Structure	Probably quite large and in a purpose-built building. Air handling plant located in spacious plenums above and below the clean room areas. Clean room typically with a peripheral viewing corridor, dust free wall, ceiling and floor linings with welded/sealed joints.
Services	Air handling will be by vertical laminar flow. Clean rooms likely to operate under positive air pressure with sprinkler systems and high intensity lighting systems. There may be special water and gas services.
Discipline	Strictest of regimes with operatives fully gowned and gloved and an air showering access procedure.
Typical air conditioning specification	Clean room classifications 100 and 1,000. ISO 14644-1 equivalent classes 5-6.

6.1.2 **Type 2**

Features	Details
Structure	Typically installed in a standard industrial style building but with specialised partitions having dust free finishes, sealed suspended ceilings and welded vinyl floor coverings with upstands.
Services	Positive pressure with entry through a simple air lock. Conventional air flow or basic laminar flow system. Flush fitting lighting system.
Discipline	Probably less strictly controlled than Type 1 but may still require full body cover.
Typical air conditioning specification	Clean room classifications 1,000 and 10,000. ISO 14644-1 equivalent classes 6-7.

6.1.3 **Type 3**

Features	Details
Structure	Almost certainly erected within existing space but may apply to corridor areas of superior establishments. More typically formed by an area partitioned off from normal production space or created from offices. Clean rooms will have dust free linings, suspended ceilings with sealed joints and surface mounted light fittings, welded vinyl floors.
Services	Simple ducted AC systems or banks of free-standing AC units.
Discipline	Direct access from non-specified production or office space. Lab coat requirement only.
Typical air conditioning specification	Clean room classifications 10,000 and 100,000. ISO 14644-1 equivalent classes 7-8.

7.0 Rateability of Clean Rooms

7.1 Dependent upon its nature, a clean room structure may be rateable either as part of the building or as an item of plant or machinery. Where a clean room structure is held to be an item of plant, the following comments are provided to assist in determining if it is rateable.

7.2 Most clean rooms will be assembled on site using either basic materials or prefabricated parts and as such will take on such an impression of permanence that they can readily be regarded as being plant "in the nature of a building or structure".

7.3 A clean room exceeding 400 m^3 will be rateable (depending on construction) in terms of Class 4, Table 4 (chambers) and a clean room of smaller capacity will still be rateable provided it is not “readily capable of being moved from one site and re-erected in its original state on another without the substantial demolition of any surrounding structure".

7.4 The valuer should be quite convinced that the clean room should be regarded as an item of plant and can be removed and re-erected before conceding rateability. Clean work-stations and laminar flow benches or cabinets installed within general clean room areas may be appropriate items to concede.

8.0 Rateability of Service Plant

8.1 The approach to the treatment of air-handling plant in clean rooms is governed by the terms of the Valuation for Rating (Plant and Machinery) (Scotland) Regulations 2000.

8.2 Class 2 of the Schedule of Prescribed Classes of Plant and Machinery describes as rateable service items including plant used for heating, cooling and ventilating but specifically excludes

"*any such plant or machinery which is in or on the lands and heritages and is used or intended to be used in connection with services mainly or exclusively as part of manufacturing operations or trade processes*".

8.3 Note that the term *Air-Conditioning* is not referred to in the Regulations but the services which air-conditioning plant provides such as heating, cooling and ventilating are specifically mentioned.

8.4 Careful consideration must therefore be given before removing any service plant from value that it is claimed was installed only as a process requirement. It is suggested that where the main or exclusive use of an item of service plant cannot be identified as being used as part of manufacturing operations or trade processes, then the item should be regarded as rateable under Class 2.

8.5 In the case of multi-purpose service plant, the functions of the plant should be individually considered. For example, in the case of an air-conditioning system which provides amongst other things, heating, the use of the heating needs to be identified and unless the heating is used mainly as part of manufacturing operations or trade processes, then an element in respect of heating should be retained in value.

8.6 It is common for the air-handling/ filtration plant in clean room facilities to be regarded as non-rateable. An element should however generally be retained in value in respect of comfort heating throughout clean-room areas.

9.0 Valuation

9.1 From an examination of the available evidence, the following percentages are to be applied to the local basic rate and represent the rateable element only.

9.2

Clean room type	Addition to Basic Rate
Type 1	+100%
Type 2	+70%
Type 3	+50%

9.3 In no case should the final rate applied be allowed to fall below that for production offices of similar structural specification valued from the local comparative scheme.

9.4 The additions stated include lighting. Less common services such as sprinklers etc. should be added as found.

10.0 Age and Obsolescence

10.1 For guidance on age and obsolescence allowances, reference should be made to SAA Basic Principles Committee Practice Note 2 - Contractor's Basis Valuations. It may provide an indication of the reductions appropriate for subjects valued on the comparative basis. It should be noted that this PN states that allowances in excess of 50% for Buildings or Plant should only be given in exceptional circumstances; refer to the PN for full guidance. It is recommended however that Assessors be guided by local evidence.

10.2 Where conversion and upgrading of existing accommodation has taken place to create clean rooms, allowances should be moderated at the valuer's discretion.