



Australian Turf Club Limited

Winx Stand Development Air Quality Assessment

October 2019

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1. Introduction

1.1 Overview

This report supports a State Significant Development (SSD Application 10285) application submitted to the Department of Planning and Environment (DP&E) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The Australian Turf Club (ATC) is seeking to secure approval to create a new, tiered retaining structure facing the racetrack at the Royal Randwick Racecourse (RRR) ('the Proposal').

The development will involve the construction of the two storey multi-purpose facility at the southern end of the existing QEII Grandstand, in the Royal Randwick Spectator Precinct. The proposed facility is designed to significantly enhance the amenity for patrons attending race day events at RRR and provide a flexible space for non-race day events. The Winx Stand will comprise an approximate 3,546sqm footprint and a maximum building height of 18m. The proposed development is summarised as follows:

Construction of a two storey multi-purpose facility comprising:

- Multi-purpose hall at ground level of approximately 3,255sqmGFA.
- Multi-purpose hall at upper level of approximately 1,788sqm.
- Food and beverage facilities.
- Entry foyer and ancillary facilities.
- Building Identification Signage.
- 'Eat Street' (The Laneway) located between the new facility and the existing multi-deck car park and day stables

1.2 Purpose of this report

This report outlines the findings of an air quality assessment for potential impacts to air during the construction and operation stages of the Proposal to inform the SSD application. Mitigation measures to reduce the impact of emissions to air associated with the Proposal are provided.

1.3 Scope and limitations

The following scope of works has been undertaken:

- Review of conceptual design and other provided information regarding construction methodology, and any operational sources of air emissions
- Identification of land-uses and receptors sensitive to potential air impacts from the Proposal
- Undertake a review of meteorology and existing air quality
- Review of potential short-term construction air quality impacts
- Review of potential operational air quality impacts from the Proposal
- Prepare a report summarising the assessment

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The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section 1.5 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Australian Turf Club Limited and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of air quality emissions) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

1.4 Secretary's Environmental Assessment Requirements (SEARs)

The specific Secretary's Environmental Assessment Requirements (SEARs) addressed in this report are summarised in Table 1-1

Table 1-1 SEARs

Assessment requirements	Section(s) of this report where addressed
7. Air quality, odour and waste The EIS shall identify potential air quality, odour and waste impacts during the construction of the development and include any appropriate mitigation measures.	Entire report

1.5 Assumptions

- GHD has relied upon information provided by Mostyn Copper, namely the nature of use of food preparation areas, and the absence of emergency generators or other plant with combustion emissions
- The gas boiler emissions have not been quantified. It is assumed the boiler will be designed, installed and operated as per relevant Australian Standards, with any flue gas appropriately vented

- No cooking of food will be undertaken at the new facility, and heating and storage of pre-cooked food will not cause significant emissions to air such as odour

2. Existing environment

2.1 Project site

Royal Randwick Racecourse is located in the eastern suburbs of Sydney NSW, approximately 6 km from Sydney's CBD. It consists of the proper course (2224 m circumference) and the inner Kensington track (2100 m circumference). The site is on Crown Land, zoned RE1 – Public Recreation, leased to The Australian Turf Club and is bounded by Alison Road, Wansey Road, High Street and Doncaster Ave. Along these boundaries are a diverse range of neighbouring properties of varying heights, including the UNSW Sydney campus along with several commercial and residential properties.

The location of the site and proposal is shown in Figure 2-1.



Figure 2-1 Proposal location

2.2 Sensitive receptors

The Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2016) defines sensitive receptors as locations where people are likely to work or reside and may include a dwelling, school, hospital, office or recreation area.

The following sensitive receptors and land uses have been identified for this assessment.

- Randwick TAFE College (to the north of the Proposal)
- Residential premises located along Alison Road (to the north and east of the Proposal)
- Residential premises located along Wansey Road (to the east of the Proposal)
- University of New South Wales (to the south of the Proposal)
- Residential premises located along Doncaster Avenue (to the west of the Proposal)

Residential receptors along Doncaster Avenue are the nearest to the proposal, approximately 100 m away.

2.3 Existing air quality

The NSW Office of Environmental Heritage (OEH) operates ambient air quality monitoring stations throughout NSW. The nearest station to the site is the Randwick station which is approximately 2.5 kilometres southeast of the site. Background particulate concentrations for 2018 at Randwick station are presented in Table 2-1. The background air quality in the proposal area is expected to be influenced by the local traffic emissions from Alison Road and Anzac Parade.

Table 2-1 Background pollutant concentrations (Randwick OEH station, 2018)

Pollutant	Averaging period	Measured concentration ($\mu\text{g}/\text{m}^3$)
Particulate matter with aerodynamic diameter less than 10 microns (PM_{10})	24 hours (Maximum)	95.5
	Annual	21.2
Particulate matter with aerodynamic diameter less than 2.5 microns ($\text{PM}_{2.5}$)	24 hours (Maximum)	31.8
	Annual	7.7
Total suspended particulates (TSP)*	Annual	42.4

Note: A TSP to PM_{10} ratio of 2:1 was assumed as there is no TSP data recorded at the station.

No significant sources of background odour were identified in this assessment other than the Royal Randwick Racecourse itself.

2.4 Local meteorology

Local wind conditions including wind speed and direction influence dispersion of pollutants from a site into the surrounding environment. Higher wind speeds can result in dust 'lift off' from stockpiles, unpaved areas and construction areas. Low wind speeds and stable conditions can result in poor dispersion of pollutants and increased localised impacts. The wind rose presented below was centred on a nearby site at Sydney Cricket Ground approximately 2 km from this proposal.

The annual wind rose is shown in Figure 2-2 and shows the following features:

- Winds are predominantly from the southwest
- Light winds ($< 2 \text{ m/s}$) are primarily from the south
- Strong winds ($> 6 \text{ m/s}$) are predominantly from the southwest, east and north
- The average wind speed is 3.1 m/s . Calms (wind speeds below 0.5 m/s) occur 1.5% of the time

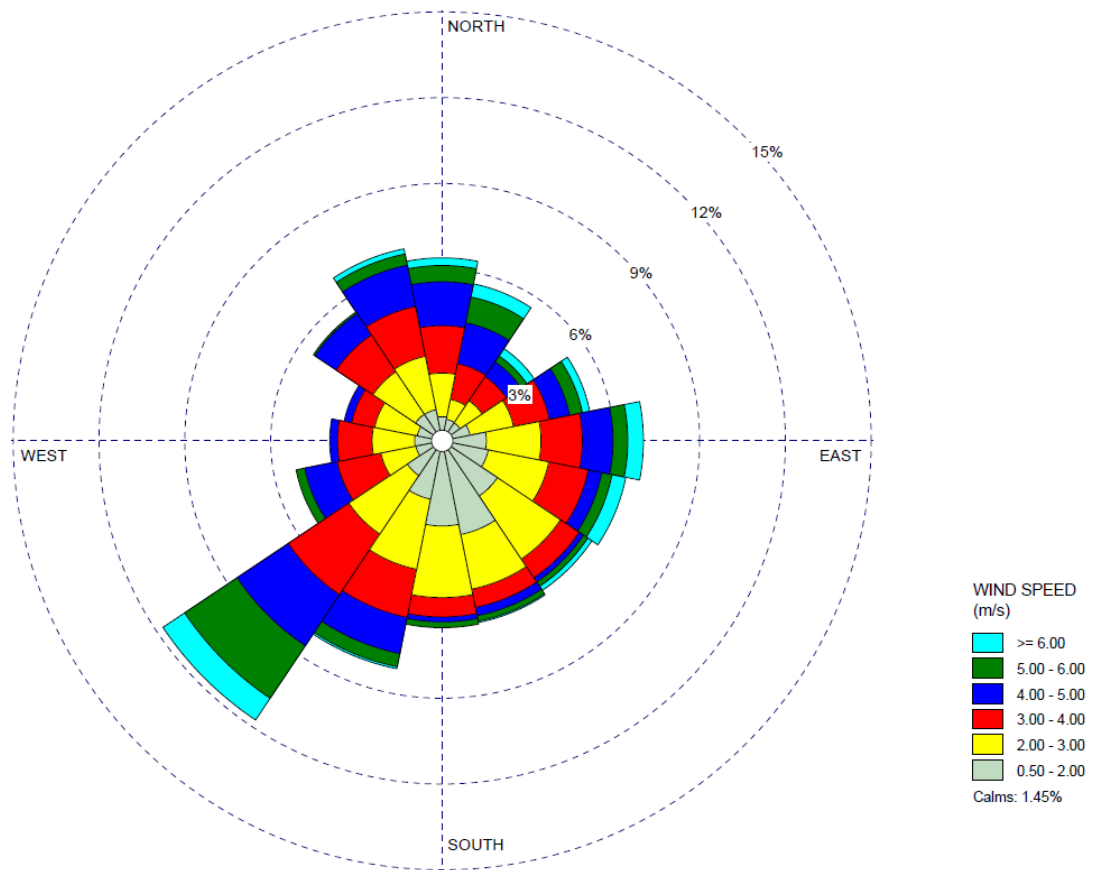


Figure 2-2 Wind rose for Sydney (2014)

3. The Proposal

The proposed development is summarised as follows:

- Multi-purpose hall at ground level of approximately 3,255sqmGFA.
- Multi-purpose hall at upper level of approximately 1,788sqm.
- Food and beverage facilities.
- Entry foyer and ancillary facilities.
- Building Identification Signage.
- 'Eat Street' (The Laneway) located between the new facility and the existing multi-deck car park and day stables.

Figures of the proposed design are included in Appendix A. These figures show the location of plant and equipment, plating kitchens and waste storage areas. The Proposal includes an area up to 17 m² for waste storage.

The site is located in the Public Recreation (RE1) land zone. The site is surrounded by the following land zone usages:

- Low Density Residential (R2) to the east
- Medium Density Residential (R3) to the east and west
- Infrastructure (SP2) to the north and south
- Neighbourhood Centre (B1) to the north
- Local Centre (B2) to the west
- Public Recreation (RE1) to the north.

4. Air quality criteria

4.1 Legislative and policy context to the assessment

The relevant legislation and government guidance for the air quality assessment of the project are:

- Protection of the Environment Operations Act 1997
- Protection of the Environment Operations (Clean Air) Regulation 2010
- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA, 2016) (Approved Methods)

The POEO Act requires that no occupier of any premises causes air pollution (including odour) through a failure to maintain or operate equipment or deal with materials in a proper and efficient manner. The operator must also take all practicable means to minimise and prevent air pollution (sections 124, 125, 126 and 128 of the POEO Act).

The POEO Act includes the concept of 'offensive odour' (section 129) and states it is an offence for scheduled activities to emit 'offensive odour'.

The NSW EPA Technical framework: Assessment and management of odour from stationary sources in NSW (Department of Environment and Conservation (NSW), 2006) outlines odour criteria to protect the majority of a population living in the vicinity of activities that emit odour. The framework refers to air quality impact assessment criteria prescribed by the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW EPA, 2016). Odour criteria ranges from 2 OU for an densely populated areas up to 7 OU for single isolated residences. There are residential buildings in close proximity as well as commercial retailers. An impact assessment criteria of 2- 3 OU would be suitable when assessing the suitability of the site.

4.2 Project impact assessment criteria

Assessment criteria has been taken from the Approved Methods. These criteria should be met at existing or future off-site sensitive receptors. The assessment criteria is provided as cumulative impacts, where the predicted impact of the project (incremental) is added to the existing levels (background) in order to assess the pollutants impacts. To determine the level of air quality impacts, emissions from the project must be assessed against the assessment criteria as shown in Table 4-1.

As discussed above, the odour criteria would be 2 OU at the nearest sensitive receptor in any impact assessment and the site is not to emit any offensive odours.

Table 4-1 Air quality impact assessment criteria

Pollutant	Averaging period	Percentile	Assessment criteria (µg/m ³)
TSP (total suspended particulates)	Annual	100th	90
PM ₁₀	24 hour	100th	50
	Annual	100th	25
PM _{2.5}	24 hour	100th	25
	Annual	100th	8

5. Project emissions and impacts

5.1 Emissions overview

Air quality may be impacted by a number of pollutants, each of which has different emission sources and effects on human health and the environment. This air quality assessment focuses on the highest-risk impacts with the potential to occur during the construction and operation of the project.

This section details the estimated air emissions from the construction and operation of the project.

5.2 Construction

5.2.1 Emissions

Particulate matter (dust) was identified as the primary emission to air during the construction of the project.

Construction activities that generate dust include demolition, excavation, earthworks and the handling and transfer of earth and other material. The key features of the project that could generate particulates during construction include:

- Site Establishment – site sheds, hoarding, fencing, temp services
- Demolition – Removal of existing temporary race day stalls
- Ground Works (including services provisions) – bulk earth works, detailed footing, piling etc
- Construction vehicle emissions from unpaved surfaces and uncovered loads

Most air quality impacts would be expected to occur during demolition or bulk ground works. Vehicles associated with each stage of works also has potential to create dust from any unpaved work areas and access roads.

Other emissions to air such as combustion products (e.g. vehicle exhaust) will also be emitted from the project site during construction. Combustion engine emission sources are expected to be discontinuous and distributed across the site as trucks and other mobile plant enter/exit/conduct work on the site. Due to the expected small number of on site combustion emissions sources and nature of their emissions, the potential impact from these emissions is considered to be negligible.

5.2.2 Impacts

Construction activities have potential to cause short term increases in particulate emissions as described in Section 5.2.1 above. This can lead to amenity and health impacts if not managed appropriately. Predicting potential particulate concentrations during construction is difficult, as exact construction methods, equipment, timing and duration are not known. Impacts will depend on the amount of emission, the mitigation applied and the specific weather conditions on the day. General construction dust mitigation measures to be considered for the project are outlined in Section 6.1.

5.3 Operation

The operational air quality assessment is based on the design prepared for the SSD application. The operation of the new tiered retaining structure is expected to result in some degree of emissions to air. This section identifies and assesses the air quality emission sources from the

operation of the new structure. While plating kitchens are proposed for the new structure, no cooking will be undertaken at the new facility, as outlined below.

Building emissions

Due to the preliminary nature to the Proposal design, accurate estimation pollutant emissions from the ventilation systems, boiler plant/gas fired hot water flue discharge system, cooling tower and Air Handling Unit (AHU) cannot be achieved. The facility would be designed using established technologies to manage air quality emissions.

Assuming all discharge points will be installed and operated in accordance with the Building Code of Australia and Australian Standard requirements – such as ventilation, vent or stack parameters and hot water flues, emissions are considered insignificant and not expected to impact any nearby sensitive receptors.

Food preparation

The proposed facility includes two plating kitchens. No food preparation is to be undertaken which involves the cooking of food within the proposed building. NSW EPA lists odours, greasy fume and fine particulates as the top three air pollution problems from food outlets¹. As no activities will be undertaken which involves cooking, frying, baking, roasting or charcoal cooking, air emissions from the plating kitchens are not anticipated.

Any food served at the new building will be cooked at existing, separate facilities located onsite that are not part of this proposal. Activities related to the serving of food at the proposal includes heating up of food and no separate exhaust or extraction system is required.

The proposal is also located at a considerable distance from nearest receptors (over 80 m), there is a significant buffer distance for any low level site emissions and odours to disperse.

Waste storage

It is anticipated that approximately 4,000 litres of waste will be generated per event. The waste would comprise a mix of general waste (food scraps, paper towels, serviettes packaging, beverage containers etc). Some of this waste would be recyclable and therefore bins for both general waste and recyclables will be provided. Considering the type of wastes likely to be generated, it is expected that a majority 240 litre wheeled bins will be used (about 17 bins). Bins would be stored in a 17 m² waste storage room.

A collection contractor will be appointed to collect waste at the conclusion of each event as required.

The location of the bin storage area will likely be over 80 m from the nearest receptors located on Doncaster Avenue. The waste will be collected from within the site (i.e. not on the roadside). The bins will not be left standing out for an extended period of time near receptors (as it's collected each day) and odour impacts are not anticipated to be significant.

Combustion plant and equipment and vehicles

No emergency generators or other equipment that are a source of emissions to air have been identified in the current stage of design. Some minor transport related emissions from delivery vans, waste trucks and staff are expected at the site but emissions are not significant when compared to existing transport emissions from Alison Road, Anzac Parade, High Street and Doncaster Avenue. This is expected to have a negligible impact on ambient combustion pollutant concentrations.

¹ <http://www.epa.nsw.gov.au/resources/air/mod3p3food07268.pdf>

6. Mitigation

6.1 Construction

Project impacts (impacts due to construction of the site) are considered minor.

The following mitigation measures are recommended for the betterment of site air quality and to reduce the impact of site activities on nearby sensitive receptors:

- Where possible avoid demolition which may include any crushing or significant dust generating activities on days when winds are blowing towards Doncaster Avenue
- Use water sprays (2 Litres/m²/h) to reduce dust generation in areas where significant earthworks is being undertaken
- Water material prior to it being loaded for on-site haulage, where required to prevent dust (depending on the load material)
- Cover all trucks hauling material in or out of the site and maintain a reasonable amount of vertical space between the top of the load and top of the trailer
- Cease dust generating works during periods of inclement weather (visible plumes of dust are observed blowing from site in the direction of sensitive receptors)

These measures will assist in reducing off-site particulate.

6.2 Operation

No adverse impacts are expected from the operation of the proposal assuming it is operated in accordance to the Building Code of Australia and Australian Standard requirements and the recommendations provided below. It is assumed that all duct work and discharge points from the building would be installed in accordance to the Building Code of Australia requirements.

The design for the SSD application does not include any cooking of food, however this should be reviewed during the detailed design stage. General mitigation to be considered during operation includes:

- good housekeeping, to avoid odours typically associated with a build-up of rancid fats and putrefaction of foods and food wastes
- management of waste as per the Waste Management Plan
- an odour complaints management system is to be maintained for the Royal Randwick Racecourse during operation

7. Conclusion

GHD has undertaken an air quality assessment for the construction and operation of the project based on the design prepared for the SSD application.

A qualitative construction and operational air quality assessment was undertaken. Sources of emissions to air from construction activities have been identified and relevant mitigation measures recommended in order to reduce potential impacts.

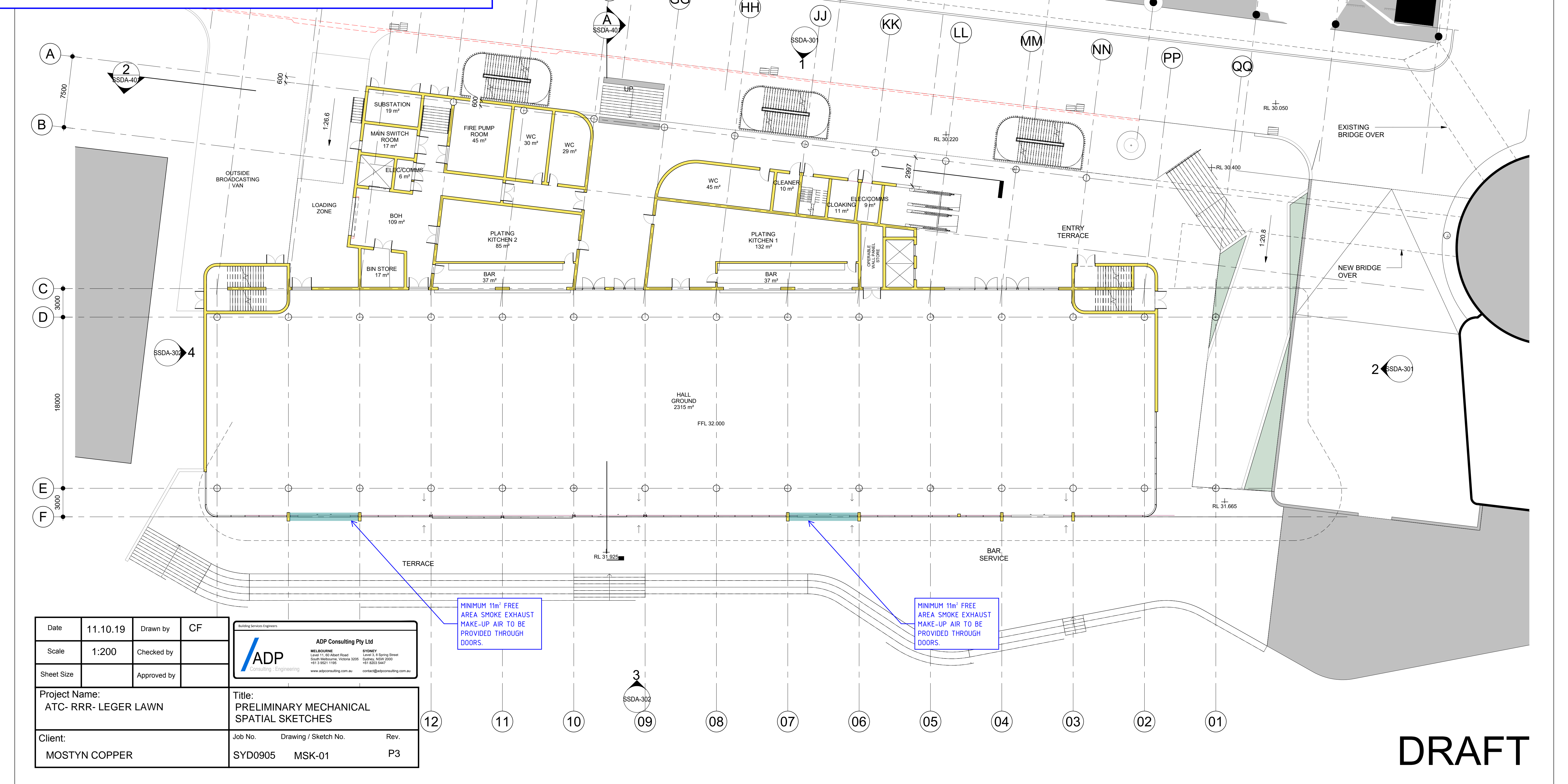
No significant operation air quality emission sources were identified, consequently no air quality impacts are expected from operation of the project.

Assuming the supplied mitigation measures are considered throughout the construction and operation of the project, the project is considered to comply from an air quality perspective.

Appendices

Appendix A – Plans of the proposal

- MECHANICAL NOTES:
1. PRELIMINARY INFORMATION ONLY. THE FINAL MECHANICAL REQUIREMENTS WILL DEPEND ON THE FOLLOWING (WHERE REQUIRED):
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4. THIRD STOREY TRIGGERS DTS SMOKE EXHAUST. (NCC Table E2.2b '9b other assembly buildings' 'a' 'iii')



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Client: MOSTYN COPPER		Job No. SYD0905	Drawing / Sketch No. MSK-01
		Rev. P3	

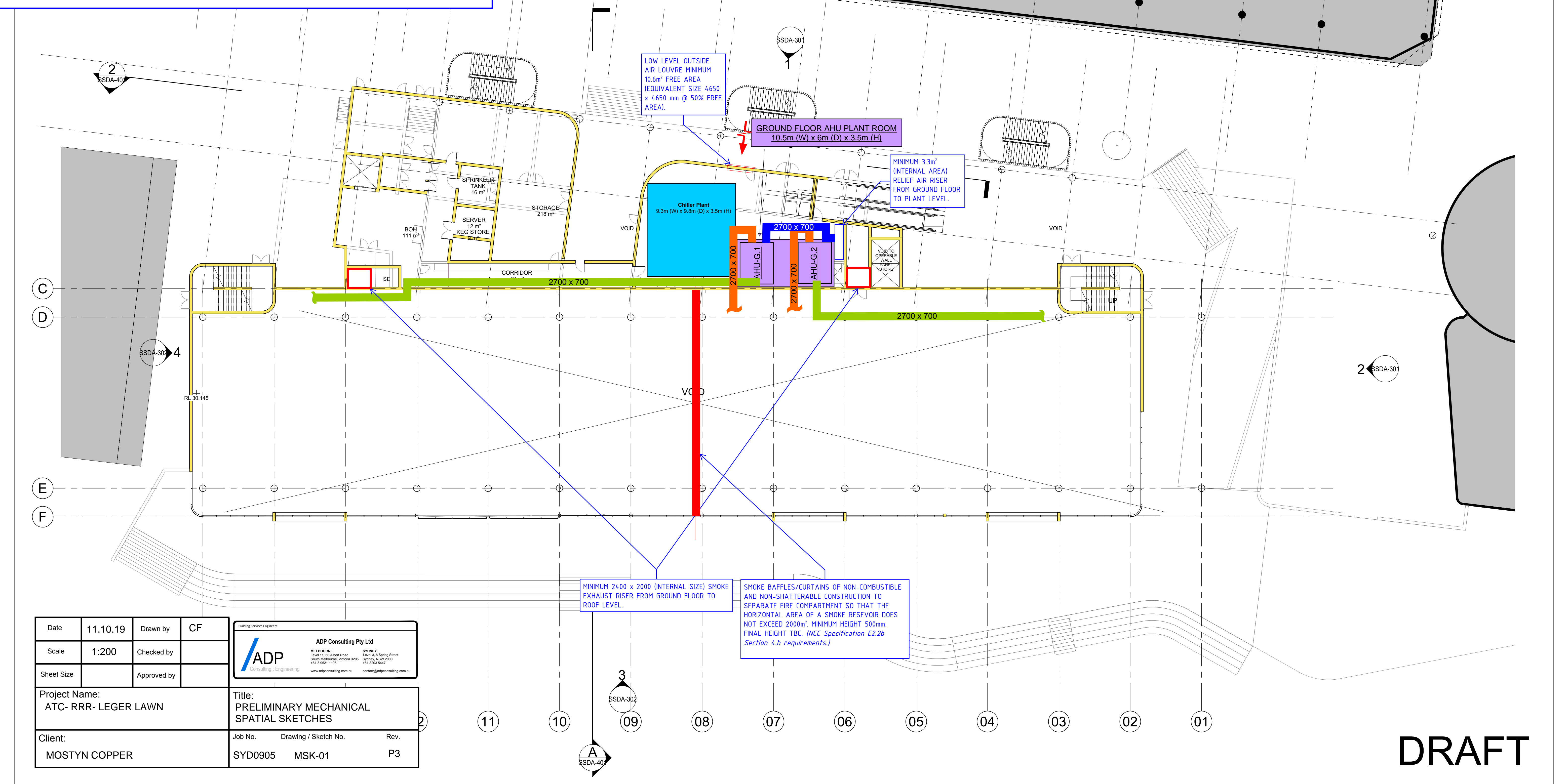
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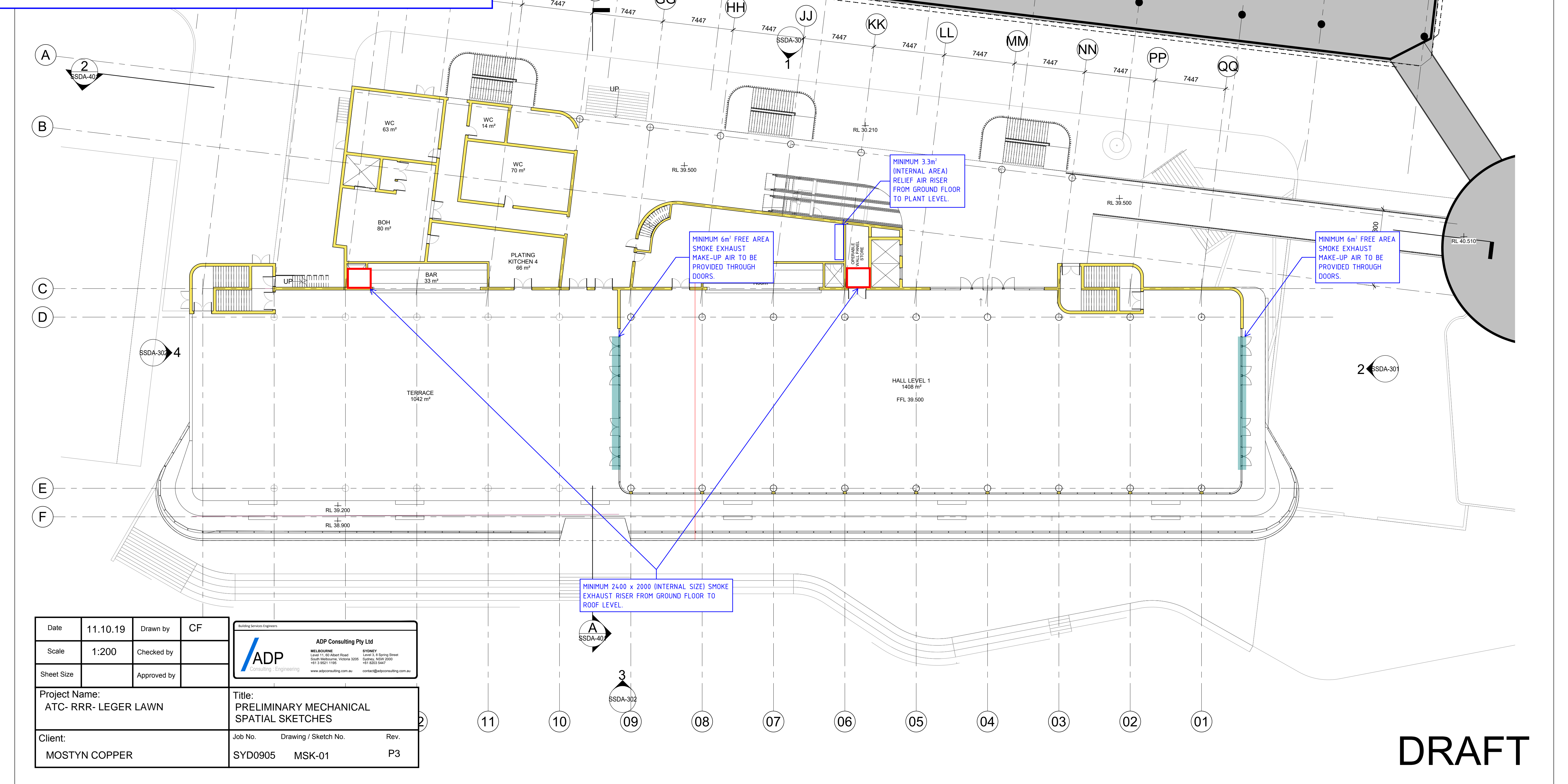
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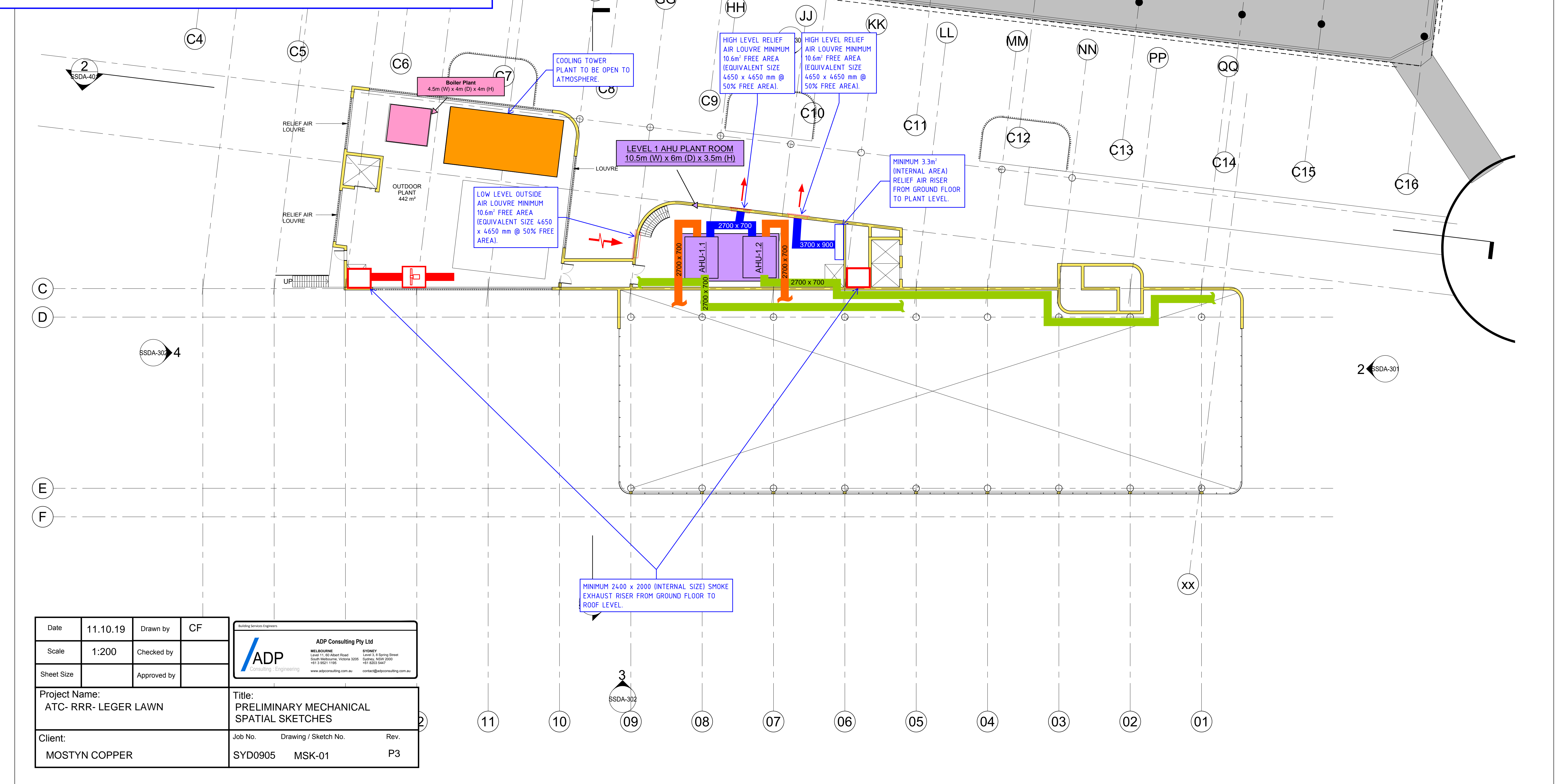
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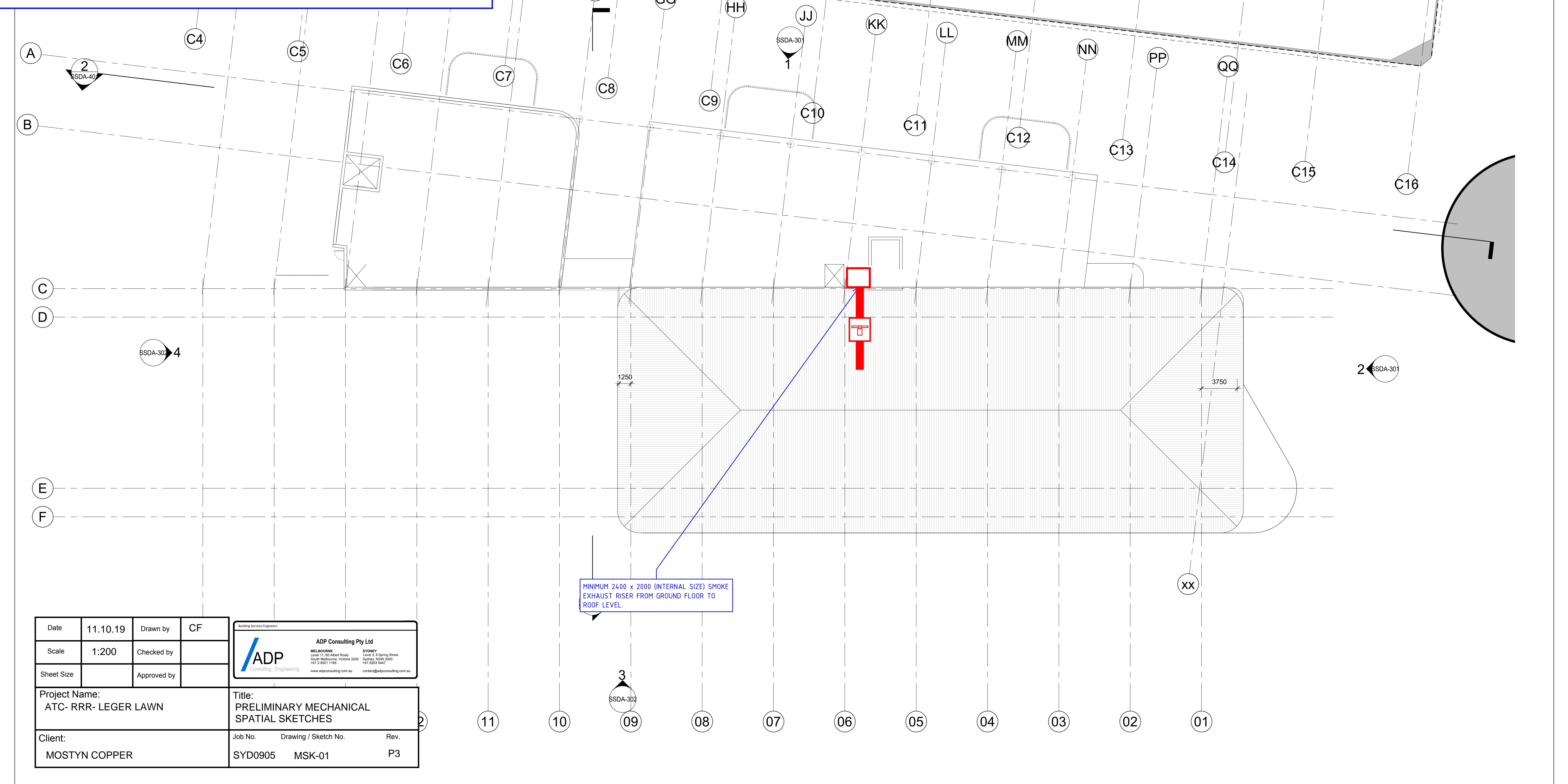
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