16. Summary

Introduction

16.1 The purpose of this Chapter is to provide a summary of the outcome of the assessments reported within **Technical Chapters 6 – 14** and **Chapter 15: Assessment of Cumulative Effects**, focussing on the following key objectives:

- Provide a summary of residual effects and conclude if these are significant or not; and
- Provide a summary of the assessment of cumulative effects, including how they differ from previously identified effects and again conclude if these are significant or not.

16.2 Through delivering these objectives, MCC should have sufficient information on environmental impacts to inform their decision-making process.

16.3 The residual effects defined within this Chapter rely upon the implementation of the mitigation set out within **Volume 3: Environmental Management Plan**. This is critical as the project team have developed detailed mitigation in order to avoid, resolve or off-set impacts. Without the implementation of **Volume 3: Environmental Management Plan,** the conclusions of the ES may change.

Summary of Residual and Significant Effects

16.4 A consolidated summary of the outputs of the assessment (i.e. residual effects and the judgement on significance) for both the construction and operation stages are set out within **Table 16.1** and **Table 16.2**, respectively.

16.5 Where effects were identified to be significant, this is indicated by the text being in **bold**, highlighted in grey, and is in red (adverse), green (beneficial), blue (neutral[a]) or in automatic / normal text (negligible).

16.6 Where Technical Chapters have identified individual level of effects for specific sensitive receptors for an assessed effect, each level of significance concluded has been stated in **Table 14.1** and **Table 14.2** and the greatest level of impact has been considered when considering the effects as a whole (i.e. to all receptors).

[a] Within the Townscape and Visual Assessment, 'neutral' is a term used to describe an effect that is both adverse and beneficial, in line with the Guidelines for Landscape and Visual Impact Assessment (GLVIA3) guidance.

Table 16.1: Summary of Residual Effects and Significant Effects During Construction

Technical Chapter	Potential Effect	Receptor	Residual Effect
Chapter 6: Socio-Economics and Human Health	Employment generated during construction	Labour force	Minor beneficial
Chapter 7: Built Heritage	Impact on the heritage significance (character and appearance) of conservation areas	Whitworth Street Conservation Area	Minor adverse
	Impact on the heritage significance of listed buildings, as a result of change within their setting	Former Refuge Assurance Company Offices (Grade II* Listed Building) India House (Grade II* Listed Building) Lancaster House (Grade II* Listed Building) Asia House (Grade II* Listed Building) Orient House (Grade II Listed Building) Granby House (Grade II Listed Building)	Negligible adverse
		Manchester House (Grade II Listed Building) Manchester South Junction and Altrincham Railway Viaduct (Grade II Listed Building) Lass O' Gowrie Public House (Grade II Listed Building) Renold Building (Grade II Listed Building) Institute of Science and Technology (Grade II Listed Building)	Minor adverse
	Impact on the heritage significance of non-designated heritage assets,	Jackson Street Mills Wright Robinson Hall and Barnes Wallis Building	Negligible adverse

Technical Chapter	Potential Effect	Receptor	Residual Effect
	as a result of change within their setting	Morton Laboratory Mathematics and Social Sciences Building	
Chapter 8: Townscape and Visual	No likely significant effects scoped in for assessment during the construction stage.		
Chapter 9: Wind Microclimate	Exceedance of criteria (Lawson) for pedestrian comfort and safety	Thoroughfares & Roadways Entrances (General) Transit Stops Off-Site Amenity Spill-Out Seating Public Realm	Negligible
Chapter 10: Daylight, Sunlight, and Overshadowing	No construction stage effects scoped in for assessment. The operational stage effects summarised in **Table 16.2** are considered to represent the worst-case construction stage effects.		
Chapter 11: Solar Glare	No construction stage effects scoped in for assessment. The operational stage effects summarised in **Table 16.2** are considered to represent the worst-case construction stage effects.		
Chapter 12: Climate Change	Greenhouse gas emissions	Global climate system	Minor adverse
Chapter 13: Air Quality	Nuisance and disturbance as a result of dust from demolition and construction activities	Echoes Day Nursery Weston Halls Student Accommodation Ibis Hotel	Negligible
	Changes to pollutant concentrations resulting from traffic generated by the Proposed Development during construction	Princess Street residential buildings Pariser Building (University of Manchester) John Garside Building (University of Manchester) George Begg Building (University of Manchester)	Negligible

Technical Chapter	Potential Effect	Receptor	Residual Effect
Chapter 14: Noise and Vibration	Nuisance and disturbance as a result of demolition and construction traffic	Echoes Day Nursery Weston Halls Student Accommodation Ibis Hotel Princess Street residential buildings Pariser Building and James Lighthill Building (University of Manchester) John Garside Building and George Begg Building (University of Manchester) Weston and Pendulum Phase A	Negligible adverse
	Nuisance and disturbance as a result of demolition and construction noise (excluding traffic)	Echoes Day Nursery Weston Halls Student Accommodation Ibis Hotel Princess Street residential buildings Granby Row residential buildings Pariser Building and James Lighthill Building (University of Manchester) John Garside Building and George Begg Building (University of Manchester) Weston and Pendulum Phase A	Minor adverse
	Nuisance and disturbance as a result of demolition and construction vibration	Echoes Day Nursery Weston Halls Student Accommodation Ibis Hotel Princess Street residential buildings	Negligible – minor adverse

Technical Chapter	Potential Effect	Receptor	Residual Effect
		Granby Row residential buildings	
		Pariser Building and James Lighthill Building (University of Manchester)	
		John Garside Building and George Begg Building (University of Manchester)	
		Weston and Pendulum Phase A	
		Faraday Tower	
		Charles Street car park	

Table 16.2: Summary of Residual Effects and their Significance During Operation

Technical Chapter	Potential Effect	Receptor	Residual Effect
Chapter 6: Socio-Economics and Human Health	Provision of PBSA	Students requiring accommodation	**Major beneficial**
Chapter 7: Built Heritage	Impact on the heritage significance (character and appearance) of conservation areas	Whitworth Street Conservation Area	Minor adverse
	Impact on the heritage significance of listed buildings, as a result of change within their setting	Asia House (Grade II* Listed Building)	Negligible adverse
		India House (Grade II* Listed Building)	
		Lancaster House (Grade II* Listed Building)	
		Manchester House (Grade II Listed Building)	
		Orient House (Grade II Listed Building)	

Technical Chapter	Potential Effect	Receptor	Residual Effect
		Granby House (Grade II Listed Building) Former Refuge Assurance Company Offices (Grade II* Listed Building) Institute of Science and Technology (Grade II Listed Building) Lass O'Gowrie Public House (Grade II Listed Building) Manchester South Junction and Altrincham Railway Viaduct (Grade II Listed Building) Renold Building, UMIST Campus (Grade II Listed Building)	
	Impact on the heritage significance of non-designated heritage assets, as a result of change within their setting	Jackson Street Mills Wright Robinson Hall and Barnes Wallis Building Morton Laboratory Mathematics and Social Sciences Building	Negligible adverse
Chapter 8: Townscape and Visual	Changes to local townscape character	LTCA1 – University Buildings, Living and Ancillary Uses	**Moderate beneficial**
	Changes to visual amenity	2. Open Space users in Vimto Park	**Moderate neutral**
		6. Users of the pedestrian route and roads immediately adjacent to the Site (Sackville Street, Charles Street and the pedestrian link and open space along the southern Site boundary)	**Moderate beneficial**

Technical Chapter	Potential Effect	Receptor	Residual Effect
Chapter 9: Wind Microclimate	Exceedance of criteria (Lawson) for pedestrian comfort and safety	Thoroughfares & Roadways Entrances (General) Transit Stops Off-Site Amenity Spill-Out Seating Public Realm	Negligible
Chapter 10: Daylight, Sunlight, and Overshadowing	Change in daylight amenity	Granby House Montana House Orient House Salisbury House Princess House	Minor adverse
	Change in sunlight amenity	Granby House Orient House Salisbury House	Minor adverse
		Montana House Princess House	Negligible
Chapter 11: Solar Glare	Solar glare	Princess St (Northbound) junction with Charles St Princess St (Southbound) junction with Whitworth St Sackville St (Northbound) merging of two lanes Sackville St (Southbound) junction with Whitworth St	Negligible

Technical Chapter	Potential Effect	Receptor	Residual Effect
		Charles St (Eastbound) junction with Princess St Hulme St (Eastbound) junction with Oxford Rd	
		Brook St (Northbound) junction with Sackville St Railway line from Oxford Rd station to Piccadilly station (Eastbound) Railway line from Piccadilly station to Oxford Rd station (Westbound)	Minor adverse
Chapter 12: Climate Change	Greenhouse gas emissions	Global climate system	Minor adverse
Chapter 13: Air Quality	No likely significant effects scoped in for assessment during the operation stage.		
Chapter 14: Noise and Vibration	No likely significant effects scoped in for assessment during the operation stage.		

16.7 A summary of the technical topics is provided in the table below where:

- No significant effects were identified – denoted by ×;
- Significant adverse effects were identified – denoted by ✓;
- Significant beneficial effects were identified – denoted by ✓; and
- A mixture of significant adverse, beneficial and neutral effects were identified – denoted by ✓.

Technical topic	Significant effects during construction?	Significant effects during operation?
Chapter 6: Socio-Economics and Human Health	×	✓
Chapter 7: Built Heritage	×	×
Chapter 8: Townscape and Visual	×	✓
Chapter 9: Wind Microclimate	×	×
Chapter 10: Daylight, Sunlight, and Overshadowing	×	×
Chapter 11: Solar Glare	×	×
Chapter 12: Climate Change	×	×
Chapter 13: Air Quality	×	×
Chapter 14: Noise and Vibration	×	×

Summary of Cumulative Effects Assessment

16.8 An assessment of cumulative effects has been completed within **Chapter 15: Assessment of Cumulative Effects**. The assessment considered the two most common types of cumulative effect; effect interactions and in-combination cumulative effects. A summary of the outputs of the assessment for each type of cumulative effect is set out below.

Effect Interactions

16.9 The assessment of effect interactions, which considers multiple effects generated by the Proposed Development impacting upon the same receptor, identified that effect interactions would be experienced by the 'population and human health' factors / receptor groups for the construction and operational stages.

16.10 At the construction stage, the potential effect interactions are in relation to the adverse effect of reduced daylight and sunlight amenity and increased solar glare (albeit this is most likely when the full massing is implemented towards the end of the construction period), noise and vibration effects from construction activities, and the beneficial effect of employment generated (in Manchester and Greater Manchester). Overall, there is not likely to be an effect interaction during the construction stage due to the different temporal and spatial scales the effects will be experienced.

16.11 During the operational stage of the Proposed Development, there is also a possible effect interaction in relation to the adverse effects of reduced daylight and sunlight amenity and increased solar glare; and the beneficial effects from the change in visual amenity and provision of PBSA. The provision of PBSA is not likely to interact with other effects as it benefits students requiring accommodation, which are not common receptors for the other residual effects. The common receptors assessed in the daylight, sunlight, solar glare and visual assessments were appraised, and no significant interactions are anticipated. The most adverse individual effect is likely to drive the perceived effect interaction.

In-Combination Effects

16.12 The assessment of in-combination effects considered 28 Cumulative Projects on a technical topic by topic basis (i.e. **Technical Chapters 6 – 14**).

16.13 A summary of the evaluation of in-combination effects is provided within **Table 16.3.**

16.14 Where a greater in-combination effect is identified and is considered to be Significant, this has been highlighted in grey**.**

Table 16.3: Summary of In-Combination Effects

Technical Topic	Summary of In-Combination Effects with Relevant Projects
Socio-Economics and Human Health	All Cumulative Projects will generate employment in the construction sector. This will exceed the level of effect considered at the project level and result in a significant cumulative effect. Cumulative Projects 3, 4, 6, 10, 14, 17 and 18 will provide PBSA. This will result in a cumulative effect quantitatively greater than at the project level (albeit the level of effect remains the same), which is significant.
Built Heritage	Cumulative Projects 1, 4, 6 and 27 have common receptors with the Proposed Development. None of the effects for the Proposed Development or Cumulative Projects in isolation exceed minor to moderate adverse significance and in-combination do not give rise to significant effects.
Townscape and Visual	Cumulative Projects 1, 2, 3, and 27 have common receptors with the Proposed Development. Significant effects arise only in a small number of cases and are associated with receptors already subject to a significant effect as a result of the Proposed Development. This means that any additional change associated with the Cumulative Projects would give rise to overall significant cumulative effects.
Wind Microclimate	Cumulative Projects 1, 2, 3, 6, 13, 27 and 28 have the potential to result in in-combination wind effects. These were modelled in CFD which demonstrated the effects would not be greater than at the project level. These effects are not significant.

Technical Topic	Summary of In-Combination Effects with Relevant Projects
Daylight and Sunlight	There are no in-combination effects as the Cumulative Projects are either not big enough or close enough to the Site to result in cumulative effects with the Proposed Development.
Solar Glare	The Proposed Development in isolation represents the worst-case assessment in terms of likely solar glare effects, as Cumulative Projects could block reflections. Effects of the Proposed Development in isolation are not significant.
Climate Change	All global cumulative GHG sources are relevant to the effect on climate change, which is taken into account when defining the global climatic system receptor as being of high sensitivity to further emissions in **Chapter 12: Climate Change**. Therefore, the cumulative effect remains as reported in **Chapter 12: Climate Change**, which is not significant.
Air Quality	There are common receptors between the Proposed Development and Cumulative Projects 1 – 4 and 27. Each Cumulative Project will mitigate the effects of construction dust through the implementation of a CEMP to ensure effects are negligible. Therefore, there will be no significant cumulative effect.
Noise and Vibration	There are only common receptors with Cumulative Projects 2 and 27. While demolition activities from Cumulative Projects 2 and 27 may extend construction noise and vibration impacts and slightly increase noise if works coincide, these effects are medium-term and transient, so the cumulative impact is not considered significant.