

Flood Risk Assessment

Student Accommodation, Rialto Cinema Site, Rialto

Rev. H

Prepared by: DO'S

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Consulting Civil & Structural Engineers

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18079/1006 rev. 07 – Foul Drainage Layout at Ground Floor Level 0

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Project Reference 18_079

Revision control table

Revision	Date	Issue	Author	Checked By
A	17.05.2018	Issue for Information	DOS	MM
B	28.05.2018	Issue to DCC Drainage for comment	DOS	MM
C	13.06.2018	Re-issue to DCC Drainage revised to incl. Lower Courtyard drainage details	DOS	MM
D	19.10.2018	Revised to architectural design changes	DOS	MM
E	21.11.2018	Revised to architectural design changes	DOS	MM
F	21.01.2018	Issue for Planning review	DOS	MM
G	14.02.19	Planning review comments added	DOS	MM
H	04.07.19	Issue for Planning	DOS	MM

1.0 Introduction

Murphy Matson O' Sullivan Consulting Engineers Ltd. were requested by Molaga Capital Ltd. to carry out a Flood Risk Assessment (FRA) for the proposed 5-7 storey over ground Student Accommodation facility (with amenity and servicing facilities at lower ground level) at Old Rialto Cinema site, South Circular Road, Rialto, Dublin 8.

This FRA has been prepared in accordance with the Guidelines for Planning Authorities on 'The Planning System and Flood Risk Management' published in November 2009 by the Office of Public Work (OPW) and the Dept of Environment, Heritage and local Government (DoEHLG). This FRA addresses points 2(i), 2(ii) 2(iii) and 2(iv) of Box 5.1 in section 5.15 of the Guidelines.

Other sources of information, attached as appendices, used to compile this FRA include:

- OPW website, www.floodmaps.ie;
- OPW Eastern CFRAM Study - Poddle Fluvial Flood Event Map (Current);
- Dublin City Council Development Plan 2016-2022 (Strategic Flood Risk Assessment).
- Greater Dublin Strategic Drainage Strategy Report (incl. TD vol. 6 - Basements)

2.0 Site Location and Description

The development is located on the South Circular Road, Rialto, Dublin 8. Figures 1 and 2 below show the site location.

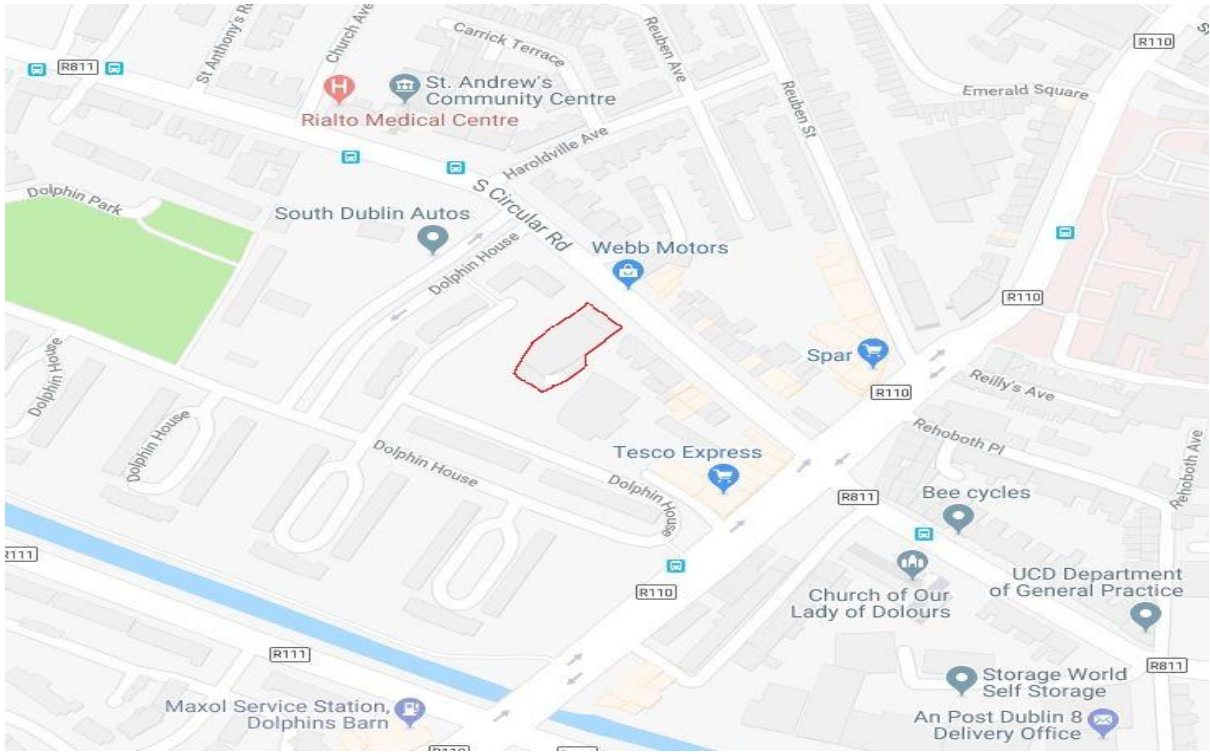


Figure 1 – Site Location Map



Figure 2 – Aerial Site Location Photo

The proposed development will provide accommodation for circa 317 no. students (313 no. bedrooms) with associated facilities. The proposed development is to incorporate part of the existing 3 storey old Cinema structure to the front of the site (fronting onto South Circular Road). The remaining rear section of the existing building on site will be demolished and be replaced by the 6-8 storey accommodation block. Refer to architect's drawings for details.

The existing site levels vary from +19.50m AOD at the front of the site rising to +20.40m AOD at the rear. The proposed development incorporates a Lower Ground floor level (-1) at + 15.825m AOD. The proposed Ground floor level (0) is at +19.95m at entrance and in Ground floor bedrooms with surrounding external courtyard areas at +19.95m with falls away from building entrances. Refer to fig's 3 & 4 and architects' drawings for details.

The site boundaries are as follows:

- North – Footpath to North Circular Road
- South – Courtyard and entrance roadway to Dolphins Barn Apartments
- East – Domestic End of Terrace House and Industrial Units accessed off South Circular Road
- West – Courtyard and entrance roadway to Dolphins Barn Apartments

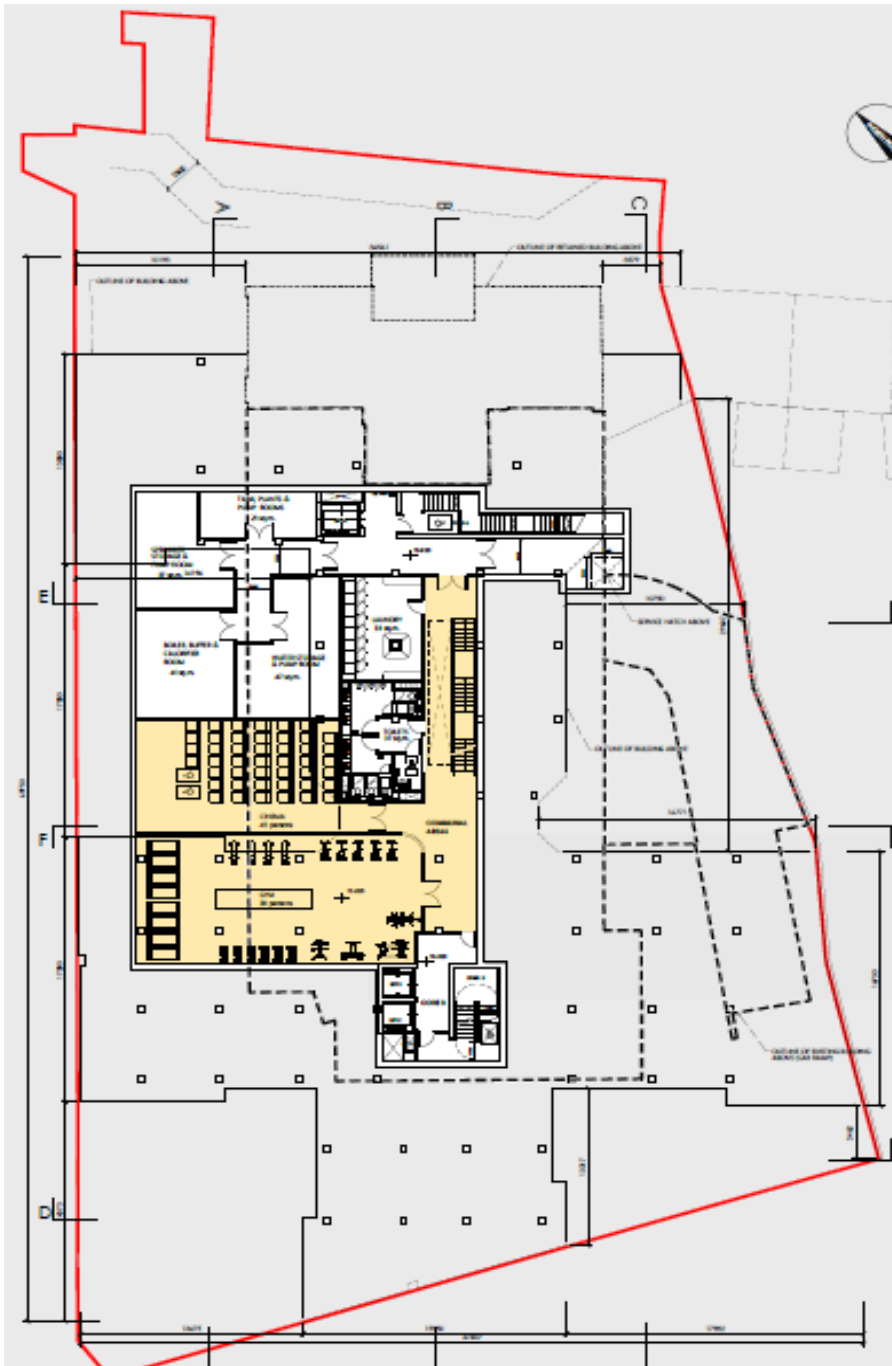


Figure 3 – Architectural Lower Ground Floor Plan Lvl. -1

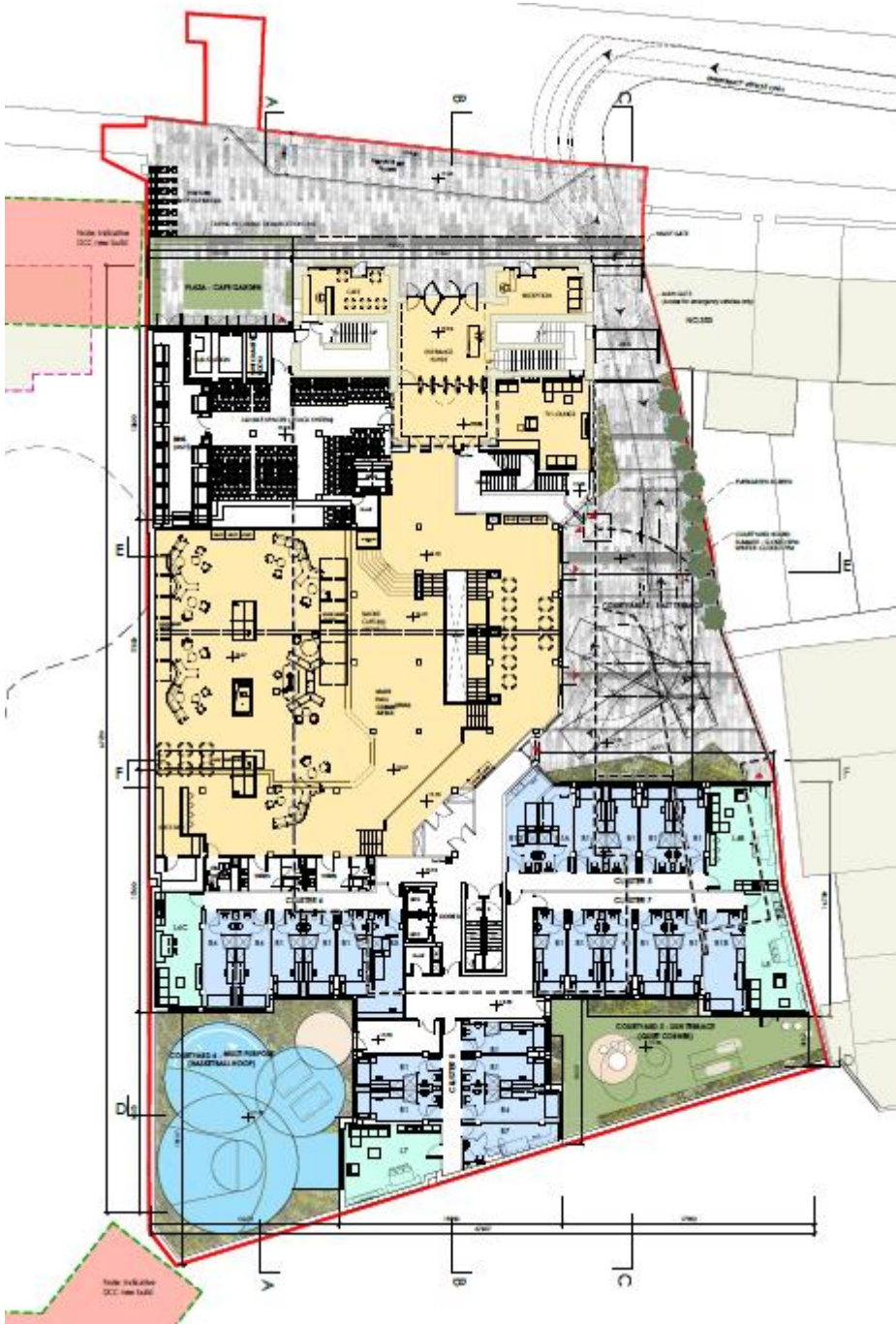


Figure 4 – Architectural Ground Floor Plan Lvl. 0

3.0 Flooding Context of Proposed Development

3.1 The Planning System and Flood Risk

'The Planning System and Flood Risk Management: Guidelines for Planning Authorities', published in November 2009, describe flooding as *a natural process that can occur at any time and in a wide variety of locations* (as per the key messages box in Chapter 2 of the Guidelines).

Flooding can often be beneficial, and many habitats rely on periodic inundation. However, when flooding interacts with human development, it can threaten people; their property and the environment (as per sections 2.6 - 2.12 of the Guidelines). Flooding may be from rivers, the sea, groundwater, sewers or overland flow caused by intense or prolonged periods of rainfall. Climate change effects suggest that the frequency and severity of flooding is likely to increase in the future.

The Guidelines describe good flood risk practice in planning and development management and seek to integrate flood risk management into the planning process, thereby assisting in the delivery of sustainable development. Planning authorities are directed to have regard to the guidelines in the preparation of Development Plans and Local Area Plans, and for development control purposes. For this to be achieved, flood risk must be assessed as early as possible in the planning process.

Paragraph 1.6 of the Guidelines states that the core objectives are to:

- *Avoid inappropriate development in areas at risk of flooding;*
- *Avoid new developments increasing flood risk elsewhere, including that which may arise from surface run-off;*
- *Ensure effective management of residual risks for development permitted in floodplains;*
- *Avoid unnecessary restriction of national, regional or local economic and social growth;*
- *Improve the understanding of flood risk among relevant stakeholders; and*
- *Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.*

The guidelines aim to facilitate 'the transparent consideration of flood risk at all levels of the planning process, ensuring a consistency of approach throughout the country'. The guidelines work on a number of key principles, including:

- *Adopting a staged and hierarchical approach to the assessment of flood risk; and*
- *Adopting a sequential approach to the management of flood risk, based on the frequency of flooding (identified through Flood Zones) and the vulnerability of the proposed land use.*

3.2 Vulnerability of Proposed Development

Under the guidelines, the proposed development (Dwelling Houses, student halls of residence and hostels) is classified as a 'Highly Vulnerable Development' (refer to Table 3.1 of the Guidelines).

3.3 Flood Zoning

Flood zones are described as follows in of the guidelines (refer to section 2.23 of the Guidelines).

Flood zones are geographical areas within which the likelihood of flooding is in a particular range and they are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning.

There are three types or levels of flood zones defined for the purposes of these Guidelines:

Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);

Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and

Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

3.4 Tidal Flooding

The site location (distance from tidal body) and elevation is such that it is not affected by tidal water bodies and as such the risk of tidal flooding is negligible. The proposed Lower Ground floor level is +15.825m AOD with Ground floor level (entrance level) at +19.95m AOD. The 0.1% (1 in 1000 year) AEP (Annual Exceedance Probability) Flood Water Level of the River Liffey, the nearest tidal body at circa 1.5 Km away, is +3.38m AOD.

3.5 Fluvial Flooding

Fluvial flooding refers to the channel capacity of a watercourse being exceeded during higher flows. There is no major watercourse located near to the site. The Office of Public Works (OPW) website, www.floodmaps.ie, shows records of any flood events in chosen areas. Refer to Appendix A for Records of Flooding in the vicinity of the site. A review of these Flood records indicates that there are no records of fluvial flooding incidents in the general area of the site.

The nearest river to the site is the Poddle River which flows south to north approx. 700m directly east of the site. The Eastern CFRAM (Catchment Flood Risk Assessment & Management) identifies areas at risk of flooding and provides assessment as to probability of flooding in an area. Refer to Eastern CFRAM study drawing E09 POD_EXCD_FO_05 in Appendix B. The map, detailing Poddle River Fluvial Flooding Extents and includes the Rialto area identifies no risk of Fluvial flooding in the area of the site.

3.6 Pluvial Flooding

Pluvial or surface water flooding is the result of rainfall generated flows that arise before runoff can enter a watercourse or sewer. As stated above in section 3.5 previous flood events in the area can be reviewed on the OPW website www.floodmaps.ie. The historical flood mapping does not indicate any flooding events in the area. We would note that the development of the site, which incorporates attenuation storage for surface water within the site, will reduce future SW run-off from the site into the local network.

Dublin City Council has developed pluvial flood risk maps as part of the Dublin City Council Development Plan 2016-2022. The Strategic Flood Risk Assessment gives Pluvial Hazard which are a high level aid rather than a site specific indicator of the potential for pluvial flooding occurring on site. See Appendix C for Composite Flood Map which identifies the site as being in Flood Zone C.

3.7 Drainage System Flooding

Drainage system flooding is defined as flooding resulting when flow entering a drainage system exceeds its discharge capacity and the system becomes blocked and/or can't discharge due to a high water level in the receiving watercourse or outfall.

External to the site there is a combined sewer, 1030mm x 600mm brick culvert, running west to east below the South Circular Road. The GSDSDS for 2031 does not indicate hydraulic issues with the local drainage network. The proposed development will limit storm water outfall to 2 l/s (by attenuation on site) for peak storm event, thus reducing the impact of the site to the network with future development.

Internal to the site, storm water from the upper roof areas will drain, via RW outlets, gullies, downpipes and suspended SW drainage pipework, to a gravity network of below ground surface water sewers on the perimeter of the site. These sewers will drain by gravity to an onsite attenuation facility proposed on the north eastern side of the site. Attenuation capacity is designed for a 1 in 100 year storm event + 20% allowance for climate change. Attenuation will be provided by a 65m³ below ground storage facility (Stormtech or similar below ground storage crate system). Attenuated outfall from this system will fall by gravity to the public combined sewer in the South Circular Road. Surface water outfall from the attenuation tank is to be restricted by a hydrobrake. The small site area (0.297 Ha.) gives a theoretical greenfield run-off rate less than 2 l/s and as such a 2 l/s value was used to calculate the required attenuation storage volume. The peak stormwater discharge is therefore to be restricted to 2 l/s.

The proposed development includes a Lower Ground Floor level for plant and leisure areas at a level of +15.825m. This level is circa 3.6 to 4.6m below the External Ground level surrounding the site and is also below the invert level of the public combined sewer in the adjacent South Circular Road. This basement area will have a monolithic concrete box (retaining wall and concrete basement slab) surround with waterproof membrane sealing the basement area against ground water ingress. As this area cannot discharge foul sewage by gravity to the public sewer in the South Circular Road, it is intended to pump sewage up to the gravity sewer proposed at Ground Floor level. A collection chamber and pump station will be required at Lower Ground Floor Level, with duty and stand-by pumps and with volume of chamber sized for 24 hour storage of foul water discharging from Lower Ground Floor level. The system will be fitted with non-return valve (or anti-backflow device) to

ensure there is no back-flooding of the Lower Basement area. This will provide for surcharge management to isolate the basement from any potential sewer surcharge.

Non-return valves shall be incorporated into the SW system at points of entry of the gravity sewers into the attenuation tank to ensure against backflow in any exceedance event. Note also that a relieving gully outlet at ground level will be built within the attenuation system, designed to allow outfall to the courtyard and out to the South Circular Road, should exceedance occur. Also a generator will be provided as part of the overall design to ensure that the drainage pumps in the basement for foul drainage are operational at all times.

Refer to MMOS Engineers drawings in Appendix D for full details of proposed drainage system.

3.8 Groundwater Flooding

Groundwater flooding occurs when the level of water stored in the ground rises, as a result of prolonged rainfall, to meet the ground surface and flows out over it. Groundwater flooding tends to be local and results from interaction of site-specific factors such as tidal variations. There is no record of Ground water flooding in the vicinity (ref. OPW Flood Maps). The sub-surface soil conditions on this site are known to be fill overlying boulder clay over rock. Typical Dublin boulder clay is saturated. The proposed development below ground will have a tanked retaining wall (monolithic with the basement concrete slab) to its perimeter and will be designed to stop any entry of groundwater using tanked construction methodology such as waterbar joints, puddle flange connections and waterproof membrane layer technology.

4.0 Flood Risk Assessment

4.1 Consequences of Flooding and Residual Risk on Occupancy of Site

Flooding of the site would risk the occupants of the Lower Ground Floor level. Note there are no bedrooms within the Lower ground floor level. Residual flood risks to the site include;

- Local overland flows from blockage of gullies or exceedance flows to the local drainage system.
- Failure of on-site foul and surface water drainage and attenuation system.

4.2 Proposed Flood Protection and Mitigation Measures

The proposed development incorporates a flood resilient design for the below ground Lower Ground Floor level (at +15.825m). This level is circa 3.6 to 4.6m below the surrounding external ground levels (ranging from +19.5 to +20.4m AOD). Habitable areas (amenity and servicing facilities but not bedrooms) are proposed for this level.

All drainage and service pipes, ducts and opes in the external walls below +19.95m AOD (external ground entrance level) in the proposed development will be flood proofed by means of non-return valves and proprietary water-proof seals.

Surcharge Management using prevention devices will be used to isolate the Lower Ground floor levels below the +19.95m external entrance level from external sewer surcharge. All internal foul water drainage will be pumped from the lower ground floor level (+15.825m) and will have non-return valves (or anti-backflow device – Type 3 Anti Flood Device incorporating an alarm to warn the Building Management of external sewer surcharge) to prevent any back flow in the event of external flooding. All manholes associated with the basement foul will be flood proof by means of being double sealed and lockable. Foul water drainage outfalling at Lower Ground Floor level will have 24-hour storage capacity as part of the design. The basement external walls and floor will be monolithic reinforced concrete construction and incorporate a waterproof membrane to be fully water resistant.

All surface water collected on the main building roofs and courtyard areas at Ground Floor level and above will be routed to discharge by gravity to the public combined sewer via the attenuation facility.

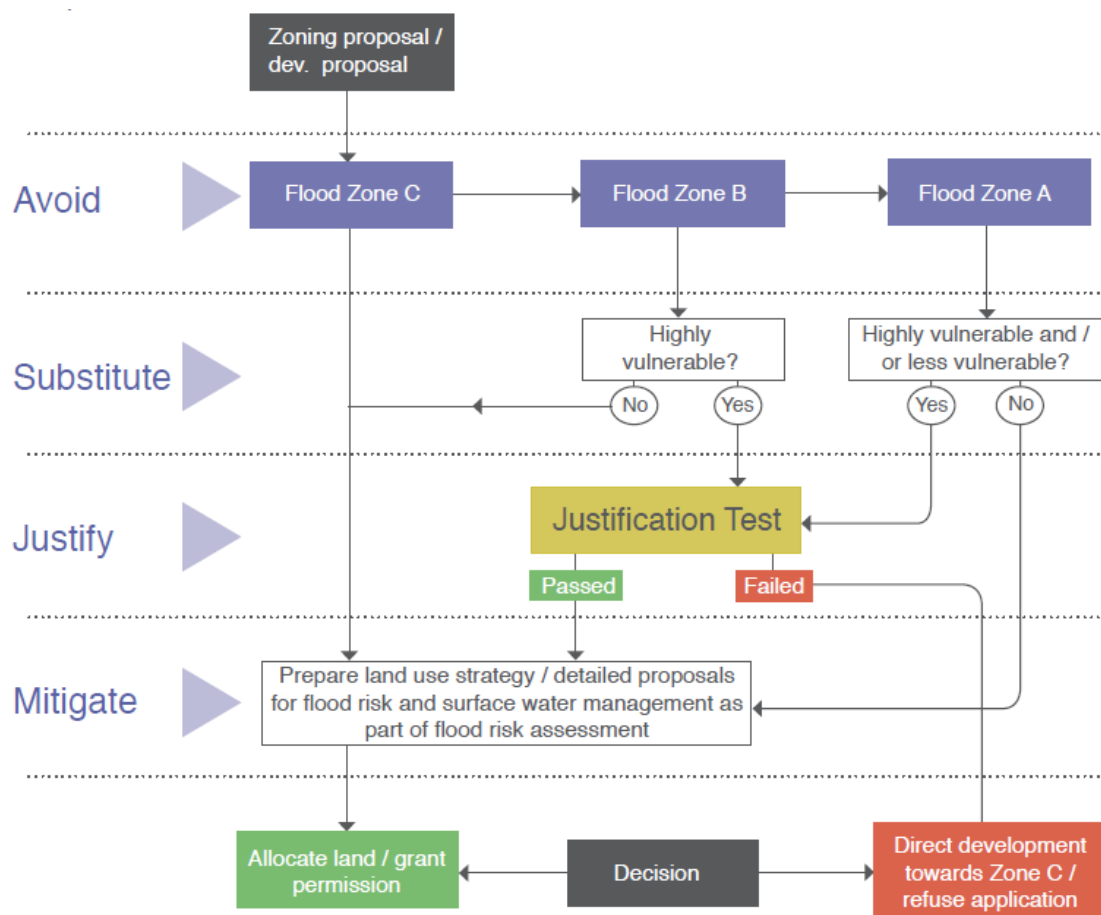
General public access and egress from the site will be from the Upper Ground floor level of +19.95m, which is circa 400mm above the road level outside the entrance (+19.50). The perimeter of the site will be bunded, with a minimum 300mm high wall above the highest external ground level at the perimeter of the site, to prevent any overland surface water flow from entering the site. Appropriate maintenance and management of the relevant storm infrastructure will minimise the risk of siltation and operational failure. Attenuation Hydrobrake to include a bypass door for mechanical operation in event of blockage or failure. System to be alarmed to signal any blockage or problems to the system. The building will have 24-Hour maintenance cover on site. Development to incorporate an electricity generator for use in case of general electricity outages in the area. This will ensure the continual operation of pumps at Lower Ground Floor level. All pumps to be Dual and assist systems,

i.e. back up pumps for operation provided should one pump fail. Telemetry and alarm systems to provide warning for maintenance team.

In the event of an extreme or severe flood event a flood awareness plan will be developed and implement by the building management company. This will follow a similar format to a fire escape strategy. Warnings of impending floods will be communicated to the building users. Where possible, building users will remain in the building until the flood recedes. Occupants at the Lower Ground Floor will be moved to the Ground Floor level. Where building users leave the building they will do so in advance of the flood with the knowledge of the time range for the flood event.

5.0 Justification Test

The sequential approach is illustrated as following in The Planning System and Flood Risk Management Guidelines for Planning Authorities.



It is clear the following applies:

- The site is in Flood Zone C;
- The Development is highly vulnerable;
- A justification test is not required and Mitigation measures are provided as outlined above.

6.0 Conclusion

The flood risk assessment for the Proposed Student Accommodation building has shown the site to be within Flood Zone C and therefore no Justification test is required. The residual risks of flooding can be managed by incorporation of good building practice in the design and construction of the Lower and Upper Ground Floor levels and associated drainage systems, and by maintenance and management of the property as outlined in section 4. As outlined above the development has been demonstrated to be in compliance with the core objectives of the Planning System and Flood Risk Management Guidelines.

Appendix A - Rialto Floodmaps Report (OPW)

Summary Local Area Report

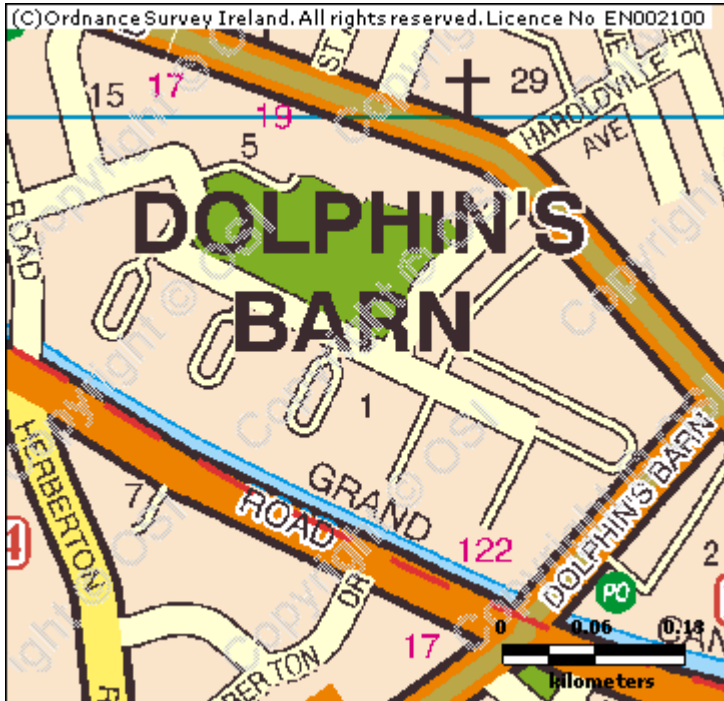
This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

The map centre is in:

County: Dublin

NGR: O 136 328

This Flood Report has been downloaded from the Web site www.floodmaps.ie. The users should take account of the restrictions and limitations relating to the content and use of this Web site that are explained in the Disclaimer box when entering the site. It is a condition of use of the Web site that you accept the User Declaration and the Disclaimer.



Map Scale 1:5,229

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *


* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained in the Glossary.


32 Results

	1. Flooding at Lady's Lane, Kilmainham, Co. Dublin on 24th Oct 2011 County: Dublin	Start Date: 24/Oct/2011 Flood Quality Code:2
Additional Information: Reports (1) More Mapped Information		
	2. Flooding at Kearns Place, Kilmainham, Dublin 8 on 24th Oct 2011 County: Dublin	Start Date: 24/Oct/2011 Flood Quality Code:2
Additional Information: Reports (1) More Mapped Information		
	3. Flooding at Harold's Cross, Dublin City on 24th Oct 2011 County: Dublin	Start Date: 24/Oct/2011 Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information		
	4. Flooding at Bow Lane, Kilmainham, Dublin 8 on 24th Oct 2011 County: Dublin	Start Date: 24/Oct/2011 Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information		
	5. Flooding at Blarney Park, Crumlin, Dublin 12 on 24th Oct 2011 County: Dublin	Start Date: 24/Oct/2011 Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information


 6. Dublin City Tidal Feb 2002 Start Date: 01/Feb/2002
County: Dublin Flood Quality Code:1
Additional Information: Photos (32) Reports (10) Press Archive (27) More Mapped Information


 7. Liffey Lower - Dec 1954 Start Date: 08/Dec/1954
County: Kildare, Dublin Flood Quality Code:2
Additional Information: Reports (4) Press Archive (2) More Mapped Information


 8. Flooding at Mount Argus Road and Kimmage Road Lower on 24th Oct 2011 Start Date: 24/Oct/2011
County: Dublin Flood Quality Code:2
Additional Information: Reports (1) More Mapped Information


 9. Poddle August 1986 Start Date: 25/Aug/1986
County: Dublin Flood Quality Code:2
Additional Information: Reports (9) Press Archive (1) More Mapped Information


 10. Camac August 1986 Start Date: 25/Aug/1986
County: Dublin Flood Quality Code:2
Additional Information: Reports (3) More Mapped Information

 11. Camac Turvey Ave Recurring Start Date:
County: Dublin Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

 12. Camac Bow Bridge Recurring Start Date:
County: Dublin Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

 13. Camac Carrickfoyle Terrace Recurring Start Date:
County: Dublin Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information















 14. Camac Kearns Place Recurring Start Date:
County: Dublin Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

 15. Camac Goldenbridge Recurring Start Date:
County: Dublin Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

 16. Clanbrassil Street June 1963 Start Date: 11/Jun/1963
County: Dublin Flood Quality Code:3
Additional Information: Reports (3) Press Archive (2) More Mapped Information

 17. Rathmines Lower June 1963 Start Date: 11/Jun/1963
County: Dublin Flood Quality Code:3
Additional Information: Reports (3) Press Archive (2) More Mapped Information

 18. Kimmage Mount Argus June 1963 Start Date: 11/Jun/1963
County: Dublin Flood Quality Code:3
Additional Information: Reports (3) Press Archive (2) More Mapped Information

	19. Harold's Cross June 1963 County: Dublin Additional Information: Reports (3) Press Archive (2) More Mapped Information	Start Date: 11/Jun/1963 Flood Quality Code:3
	20. Mount Jerome Harold's Cross June 1963 County: Dublin Additional Information: Reports (3) Press Archive (2) More Mapped Information	Start Date: 11/Jun/1963 Flood Quality Code:3
	21. Kimmage June 1963 County: Dublin Additional Information: Reports (3) Press Archive (2) More Mapped Information	Start Date: 11/Jun/1963 Flood Quality Code:3
	22. Grafton Street June 1963 County: Dublin Additional Information: Reports (3) Press Archive (2) More Mapped Information	Start Date: 11/Jun/1963 Flood Quality Code:3
	23. Poddle Park Nov 2000 County: Dublin Additional Information: Reports (1) More Mapped Information	Start Date: 05/Nov/2000 Flood Quality Code:3
	24. Poddle Tributary Marrowbone Lane Jan 1941 County: Dublin Additional Information: Reports (1) More Mapped Information	Start Date: 21/Jan/1941 Flood Quality Code:4
	25. Poddle St Claires Ave Sept 1931 County: Dublin Additional Information: Reports (1) More Mapped Information	Start Date: 03/Sep/1931 Flood Quality Code:3
	26. Poddle Limekiln Lane Sept 1931 County: Dublin Additional Information: Reports (1) More Mapped Information	Start Date: 03/Sep/1931 Flood Quality Code:3
	27. Poddle Limekiln Lane Aug 1905 County: Dublin Additional Information: Reports (1) More Mapped Information	Start Date: 24/Aug/1905 Flood Quality Code:3
	28. Poddle Larkfield Mills Undated 1940s County: Dublin Additional Information: Reports (1) More Mapped Information	Start Date: Flood Quality Code:4
	29. Poddle Harold's Cross undated 1940's County: Dublin Additional Information: Reports (1) More Mapped Information	Start Date: Flood Quality Code:4
	30. Flooding at Bridgewater Quay Apartments, Islandbridge, Dublin 8, on 24th Oct 2011 County: Dublin Additional Information: Reports (1) More Mapped Information	Start Date: 24/Oct/2011 Flood Quality Code:2
	31. Flooding at Ashling Hotel, Parkgate Street, Dublin 8 on 24th Oct 2011 County: Dublin Additional Information: Reports (1) More Mapped Information	Start Date: 24/Oct/2011 Flood Quality Code:2
	32. Flooding at Junction of Terenure Road and Kimmage Road, Additional Information: Reports (1) More Mapped Information	Start Date: 24/Oct/2011



Dublin 6W on 24th Oct 2011
County: Dublin

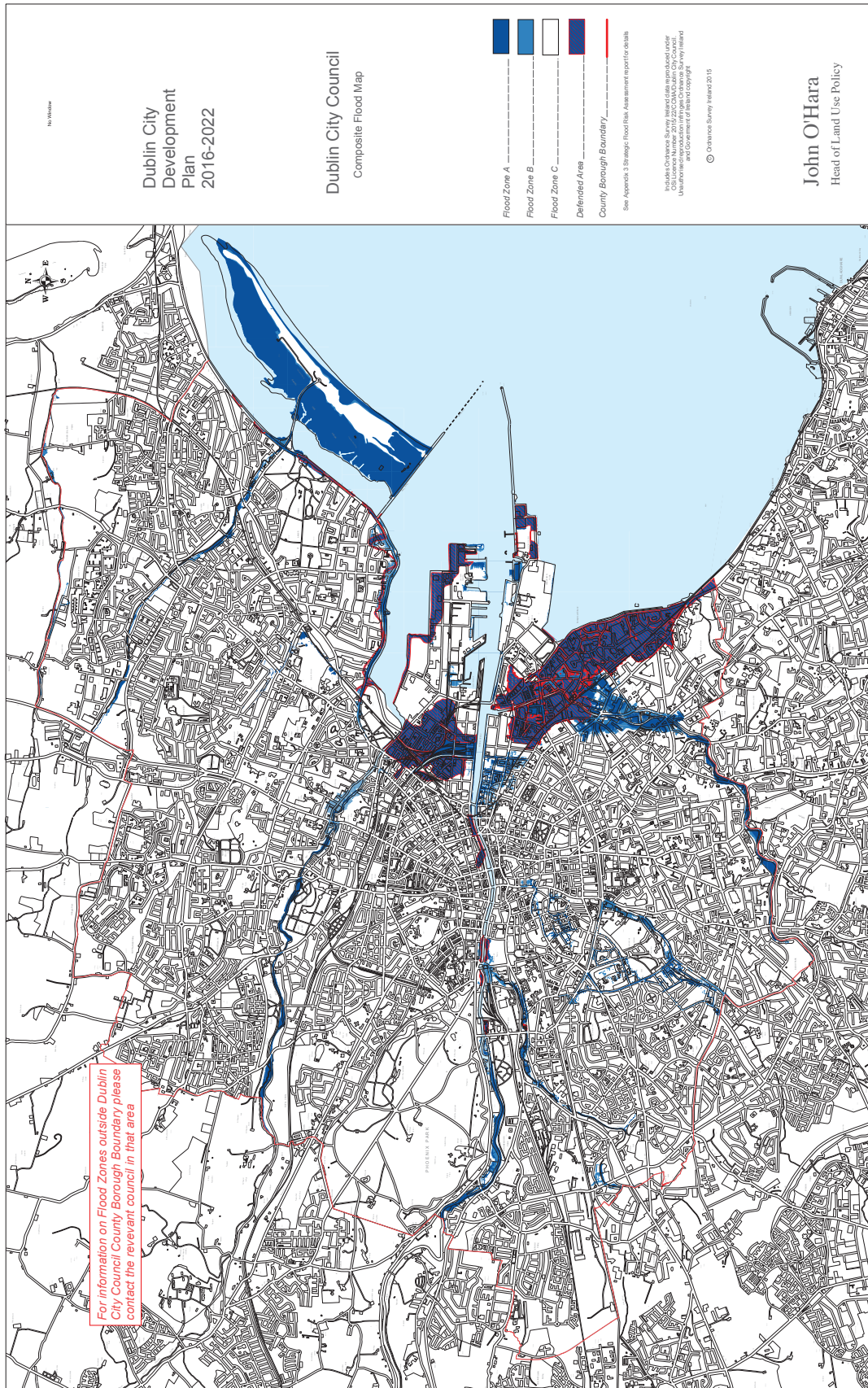
Flood Quality Code:2

Additional Information: Reports (1) More Mapped Information

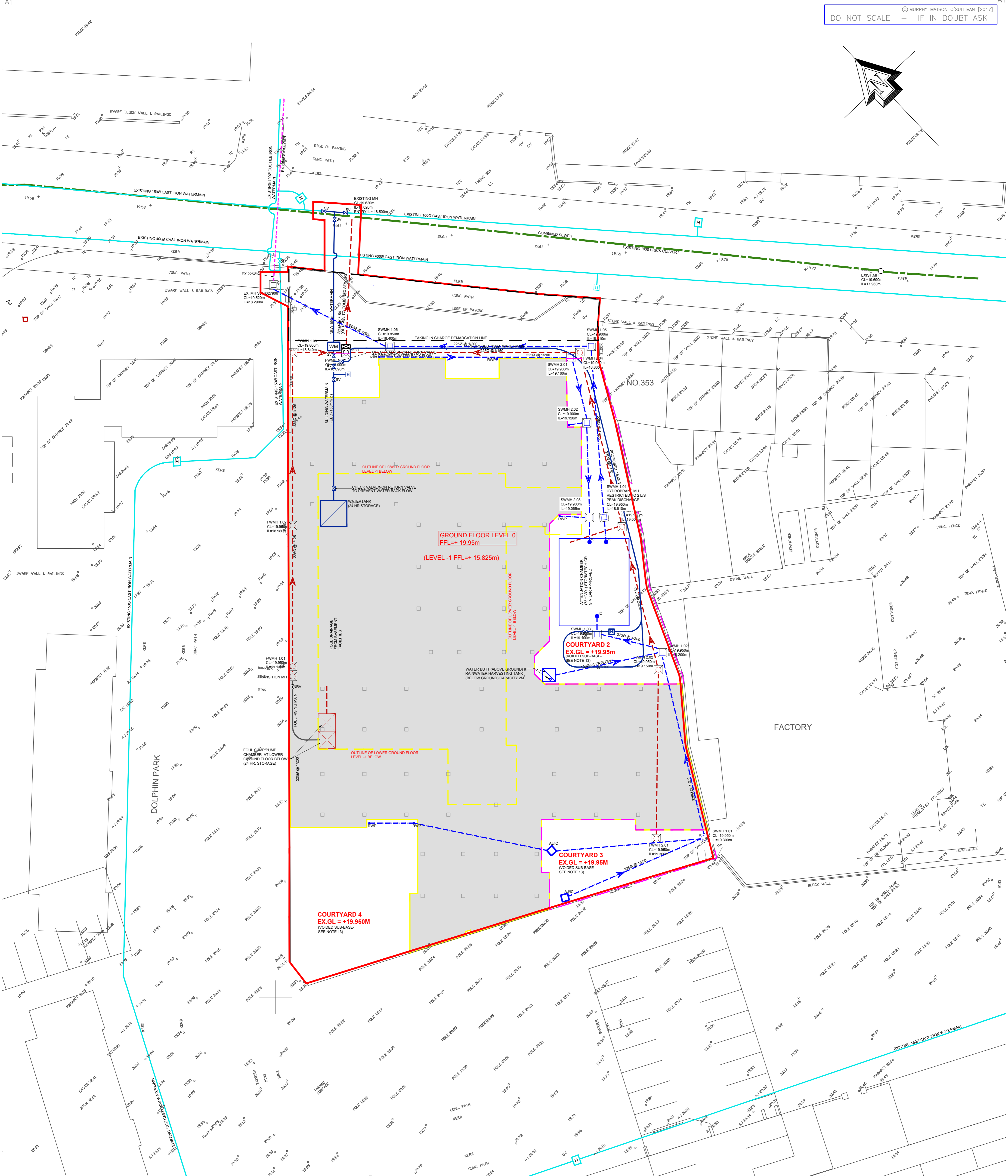
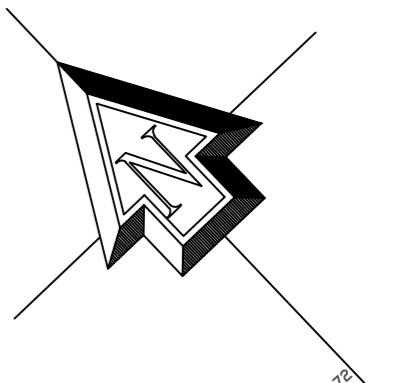
Appendix B – DCC Pluvial Map



Appendix C - DCC Composite Flood Zone map



Appendix D - MMOS Civil drawings



DRAINAGE LEGEND

- PROPOSED SW MANHOLE
- PROPOSED SW DRAIN
- ACCESS JUNCTION/ INSPECTION CHAMBER
- RAIN WATER DOWN PIPE
- PROPOSED FOUL MAN HOLE
- PROPOSED FOUL DRAIN
- ACCESS JUNCTION/ INSPECTION CHAMBER
- FOUL RISING MAIN
- NON RETURN VALVE
- EXISTING SURFACE WATER
- EXISTING COMBINED DRAIN
- NEW NON RETURN VALVE
- EXISTING WATERMAIN
- EXISTING HYDRANT
- PROPOSED 1500 WATERMAIN
- PROPOSED HYDRANT
- PROPOSED AIR VALVE
- PROPOSED WATER METER
- RAIN WATER DOWN PIPE
- INSPECTION CHAMBER
- CHECK VALVE/NON RETURN VALVE

REV	DATE	DESCRIPTION	DRAWN BY	CHKD
07	04/07/19	RED LINE BOUNDARY REVISED - MINOR CHANGES		
06	22/05/19	REVISED AS PER ARCHITECTS REVISIONS		
05	16/04/19	REVISED TO IW/DCC COMMENTS		
04	20/03/19	RESPONSE TO IW QUERIES		
03	24/01/19	REVISED AS PER ARCHITECTS REVISIONS		
02	19/10/18	REVISED AS PER ARCHITECTS REVISIONS		
01	14/06/18	GENERAL AMENDMENTS		
00	27/04/18	DRAFT FOR DISCUSSION		

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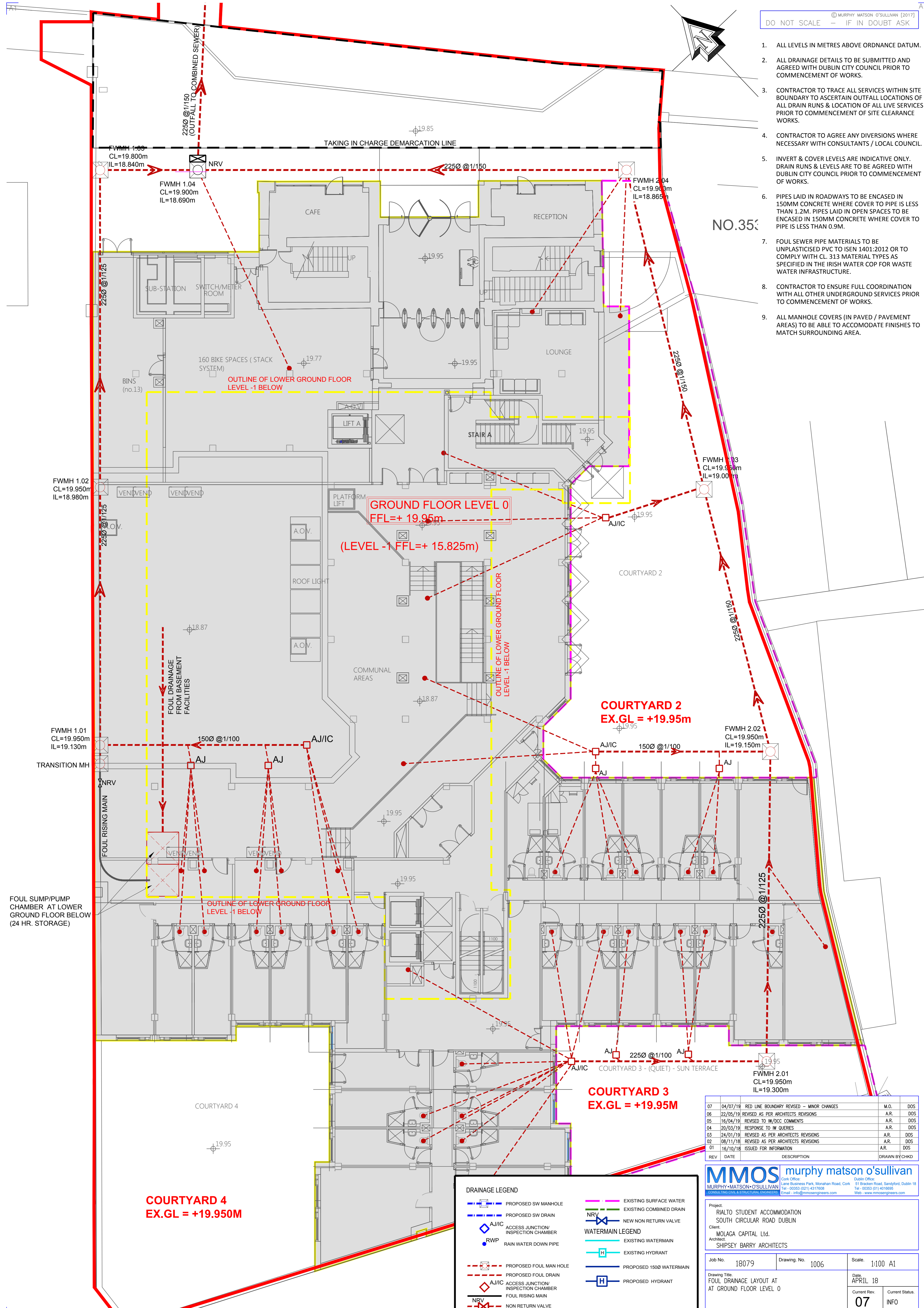
Project: RIALTO STUDENT ACCOMMODATION
SOUTH CIRCULAR ROAD DUBLIN

Client: MOLAGA CAPITAL Ltd.

Architect: SHIPSEY BARRY ARCHITECTS

Job No. 18079	Drawing No. 1000	Scale. 1:200 A1
Drawing Title: OVERALL SITE DRAINAGE/WATERMAIN LAYOUT AT GROUND FLOOR LEVEL 0		Date: APRIL 18
		Current Rev. 07
		Current Status. INFO

- ALL LEVELS IN METRES ABOVE ORDNANCE DATUM.
- ALL DRAINAGE DETAILS TO BE SUBMITTED AND AGREED WITH DUBLIN CITY COUNCIL PRIOR TO COMMENCEMENT OF WORKS.
- CONTRACTOR TO TRACE ALL SERVICES WITHIN SITE BOUNDARY TO ASCERTAIN OUTFALL LOCATIONS OF ALL DRAIN RUNS & LOCATION OF ALL LIVE SERVICES PRIOR TO COMMENCEMENT OF SITE CLEARANCE WORKS.
- CONTRACTOR TO AGREE ANY DIVERSIONS WHERE NECESSARY WITH CONSULTANTS / LOCAL COUNCIL.
- INVERT & COVER LEVELS ARE INDICATIVE ONLY. DRAIN RUNS & LEVELS ARE TO BE AGREED WITH DUBLIN CITY COUNCIL PRIOR TO COMMENCEMENT OF WORKS.
- PIPES LAID IN ROADWAYS TO BE ENCASED IN 150MM CONCRETE WHERE COVER TO PIPE IS LESS THAN 1.2M. PIPES LAID IN OPEN SPACES TO BE ENCASED IN 150MM CONCRETE WHERE COVER TO PIPE IS LESS THAN 0.9M.
- FOUL SEWER PIPE MATERIALS TO BE UNPLASTICISED PVC TO ISEN 1401:2012 OR TO COMPLY WITH CL. 313 MATERIAL TYPES AS SPECIFIED IN THE IRISH WATER COP FOR WASTE WATER INFRASTRUCTURE.
- CONTRACTOR TO ENSURE FULL COORDINATION WITH ALL OTHER UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF WORKS.
- ALL MANHOLE COVERS (IN PAVED / PAVEMENT AREAS) TO BE ABLE TO ACCOMMODATE FINISHES TO MATCH SURROUNDING AREA.



FOUL SUMP/PUMP CHAMBER AT LOWER GROUND FLOOR LEVEL BELOW (24 HR. STORAGE)

COURTYARD 4 EX.GL = +19.950m

GROUND FLOOR LEVEL 0 FFL = +19.95m
(LEVEL -1 FFL = +15.825m)

COURTYARD 2 EX.GL = +19.95m

COURTYARD 3 EX.GL = +19.95m

DRAINAGE LEGEND

- PROPOSED SW MANHOLE
- PROPOSED SW DRAIN
- AJIC ACCESS JUNCTION/ INSPECTION CHAMBER
- RWP RAIN WATER DOWN PIPE
- PROPOSED FOUL MAN HOLE
- PROPOSED FOUL DRAIN
- AJIC ACCESS JUNCTION/ INSPECTION CHAMBER
- FOUL RISING MAIN
- NRV NON RETURN VALVE
- EXISTING SURFACE WATER
- EXISTING COMBINED DRAIN
- NRV NEW NON RETURN VALVE
- WATERMAIN LEGEND
- EXISTING WATERMAIN
- EXISTING HYDRANT
- PROPOSED 150Ø WATERMAIN
- PROPOSED HYDRANT

REV	DATE	DESCRIPTION	DRAWN BY	CHKD
07	04/07/19	RED LINE BOUNDARY REVISED - MINOR CHANGES	M.O.	DOS
06	22/05/19	REVISED AS PER ARCHITECTS REVISIONS	A.R.	DOS
05	16/04/19	REVISED TO IW/DCC COMMENTS	A.R.	DOS
04	20/03/19	RESPONSE TO IW/DCS	A.R.	DOS
03	24/01/19	REVISED AS PER ARCHITECTS REVISIONS	A.R.	DOS
02	08/11/18	REVISED AS PER ARCHITECTS REVISIONS	A.R.	DOS
01	16/10/18	ISSUED FOR INFORMATION	A.R.	DOS

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Project: RIALTO STUDENT ACCOMMODATION SOUTH CIRCULAR ROAD DUBLIN
 Client: MOLAGA CAPITAL Ltd.
 Architect: SHIPSEY BARRY ARCHITECTS

Job No. 18079 | Drawing No. 1006 | Scale: 1:100 A1
 Drawing Title: FOUL DRAINAGE LAYOUT AT AT GROUND FLOOR LEVEL 0
 Date: APRIL 18
 Current Rev. 07 | Current Status: INFO

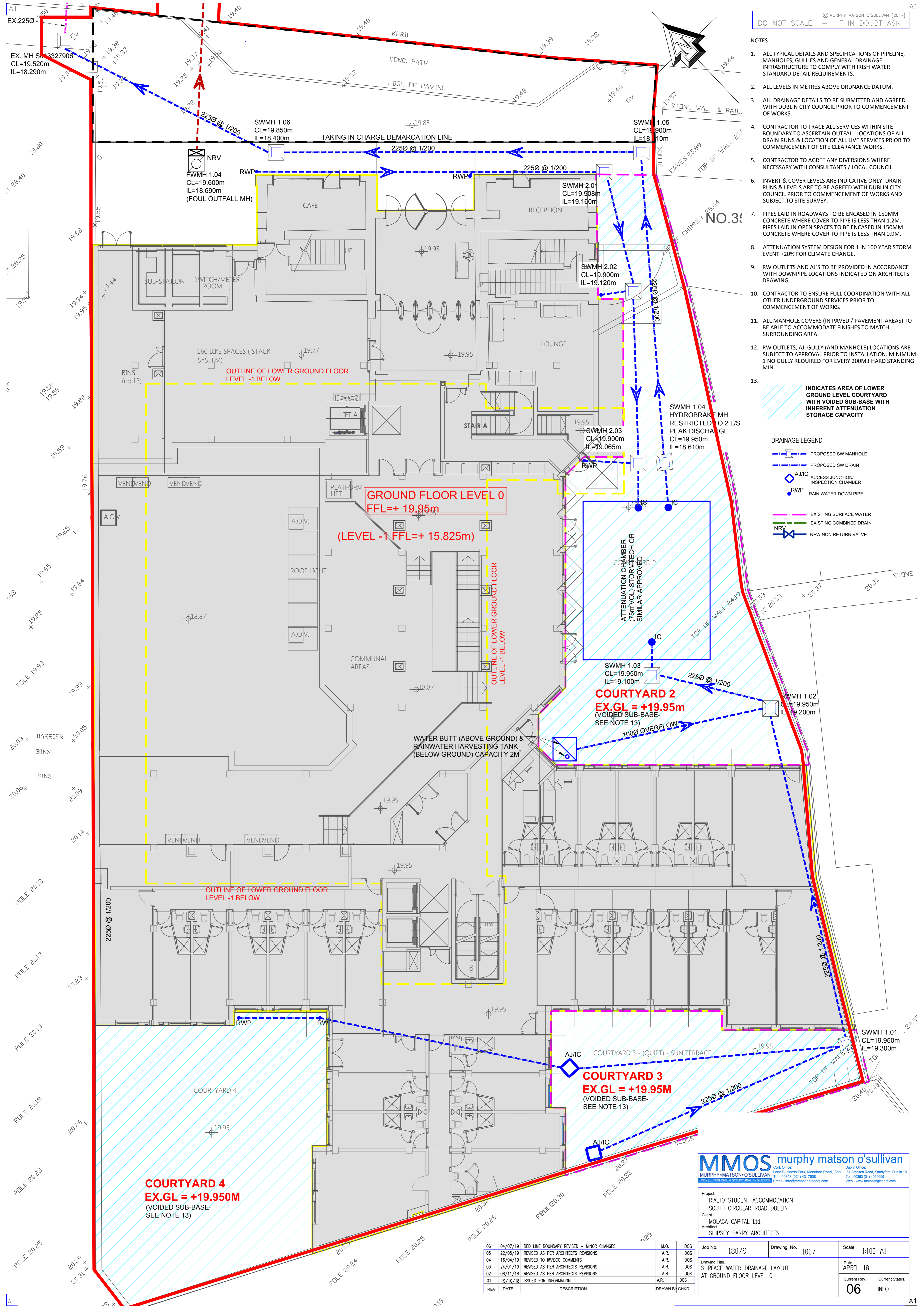
NOTES

1. ALL TYPICAL DETAILS AND SPECIFICATIONS OF PIPELINE, MANHOLES, GULLIES AND GENERAL DRAINAGE INFRASTRUCTURE TO COMPLY WITH IRISH WATER STANDARD DETAIL REQUIREMENTS.
2. ALL LEVELS IN METRES ABOVE ORDINANCE DATUM.
3. ALL DRAINAGE DETAILS TO BE SUBMITTED AND AGREED WITH DUBLIN CITY COUNCIL PRIOR TO COMMENCEMENT OF WORKS.
4. CONTRACTOR TO TRACE ALL SERVICES WITHIN SITE BOUNDARY TO ASCERTAIN OUTFALL LOCATIONS OF ALL DRAIN RUNS & LOCATION OF ALL LIVE SERVICES PRIOR TO COMMENCEMENT OF SITE CLEARANCE WORKS.
5. CONTRACTOR TO AGREE ANY DIVERSIONS WHERE NECESSARY WITH CONSULTANTS / LOCAL COUNCIL.
6. INVERT & COVER LEVELS ARE INDICATIVE ONLY. DRAIN RUNS & LEVELS ARE TO BE AGREED WITH DUBLIN CITY COUNCIL PRIOR TO COMMENCEMENT OF WORKS AND SUBJECT TO SITE SURVEY.
7. PIPES LAID IN ROADWAYS TO BE ENCASED IN 150MM CONCRETE WHERE COVER TO PIPE IS LESS THAN 1.2M. PIPES LAID IN OPEN SPACES TO BE ENCASED IN 150MM CONCRETE WHERE COVER TO PIPE IS LESS THAN 0.9M.
8. ATTENUATION SYSTEM DESIGN FOR 1 IN 100 YEAR STORM EVENT +20% FOR CLIMATE CHANGE.
9. RW OUTLETS AND AJ'S TO BE PROVIDED IN ACCORDANCE WITH DOWNPIPE LOCATIONS INDICATED ON ARCHITECTS DRAWING.
10. CONTRACTOR TO ENSURE FULL COORDINATION WITH ALL OTHER UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF WORKS.
11. ALL MANHOLE COVERS (IN PAVED / PAVEMENT AREAS) TO BE ABLE TO ACCOMMODATE FINISHES TO MATCH SURROUNDING AREA.
12. RW OUTLETS, AJ, GULLY (AND MANHOLE) LOCATIONS ARE SUBJECT TO APPROVAL PRIOR TO INSTALLATION. MINIMUM 1 NO GULLY REQUIRED FOR EVERY 200M³ HARD STANDING MIN.

INDICATES AREA OF LOWER GROUND LEVEL COURTYARD WITH VOIDED SUB-BASE WITH INHERENT ATTENUATION STORAGE CAPACITY

DRAINAGE LEGEND

- PROPOSED SW MANHOLE
- PROPOSED SW DRAIN
- AJ/IC ACCESS JUNCTION/ INSPECTION CHAMBER
- RWP RAIN WATER DOWN PIPE
- EXISTING SURFACE WATER
- EXISTING COMBINED DRAIN
- NEW NON RETURN VALVE



REV	DATE	DESCRIPTION	M.O.	DOS
06	04/07/19	RED LINE BOUNDARY REVISED - MINOR CHANGES	A.R.	DOS
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Project: RIALTO STUDENT ACCOMMODATION
 SOUTH CIRCULAR ROAD DUBLIN
 Client: MOLAGA CAPITAL Ltd.
 Architect: SHIPSEY BARRY ARCHITECTS

Job No. 18079	Drawing No. 1007	Scale. 1:100 A1
Drawing Title: SURFACE WATER DRAINAGE LAYOUT AT GROUND FLOOR LEVEL 0		Date: APRIL 18
Current Rev. 06		Current Status: INFO