

**ENGINEERS REPORT  
UNITED DRUG, MAGNA BUSINESS PARK, DUBLIN 24  
PROPOSED WAREHOUSE EXTENSION  
32120  
30<sup>TH</sup> AUGUST 2022**

<b>Issued For</b>	<b>Final</b>
<b>Distribution</b>	<b>Architect</b>
<b>Revision</b>	<b>B</b>

---

CLIENT:	UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS PARK, D24	REF:	32120
PROJECT:	PROPOSED WAREHOUSE EXTENSION	DATE:	29 <sup>TH</sup> AUGUST 2022

---

## **1 INTRODUCTION**

- 1.1** An application for Planning Permission (Register Reference SD22A/0149) has been made for a single storey extension, with a floor area 150m<sup>2</sup>, to an existing warehouse at the United Drug facility located in Magna Business Park, Dublin 24.
- 1.2** This document was prepared in response to a letter dated 18<sup>th</sup> July 2022 from South Dublin County Council requesting additional information.
- 1.3** The key elements of the response to the South Dublin Council request for additional information have been discussed and agreed in principle with Mr. Brian Harkin, Senior Executive Engineer, South Dublin County Council.

CLIENT: UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

REF: 32120

PROJECT: PROPOSED WAREHOUSE EXTENSION

DATE: 29<sup>TH</sup> AUGUST 2022

## 2 DESCRIPTION OF THE EXISTING UNITED DRUG FACILITY

**2.1** The existing United Drug facility occupies a site in Magna Business Park with an area of 5.9 hectares.

**2.2** The existing facility (shown below) is composed of interconnected warehouse and office buildings with extensive paved yards and car parking.



**Figure 1: Aerial Photograph of the existing United Drug facility**

**2.3** The existing facility was developed in two phases as follows:

- Phase 1, the western half of the site with an area of 3.0 hectares, was constructed in 1999, in accordance with the Planning Permission granted (Reg. Ref. S99A/C414).
- Phase 2, the remainder of the site with an area of 2.9 hectares was constructed in 2003, in accordance with the Planning Permission granted (Reg. Ref. SD02A/0402).

## 3 EXISTING SURFACE WATER DRAINAGE SYSTEM

**3.1** For details of the current site drainage network please refer to Henry J Lyons drawing number 950926 P0002 EXISTING SITE LAYOUT PLAN DRAINAGE LAYOUT.

CLIENT: UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

REF: 32120

PROJECT: PROPOSED WAREHOUSE EXTENSION

DATE: 29<sup>TH</sup> AUGUST 2022

**3.2** The site is underlain by stiff boulder clay which is effectively impermeable and consequently the site is unsuitable for the use of infiltration devices to dispose of surface water run-off.

**3.3** Surface water runoff from existing roofs and paved areas is collected in the underground surface water drainage network and conveyed to an existing precast concrete underground attenuation tank. The tank is located at the north west corner of the site near the vehicle access to the service yard.

**3.4** Surface water is discharged from the existing underground attenuation tank to the Magna Business Park drainage system at a controlled rate

**3.5** As noted above the existing facility was developed in two phases. Phase 1 was constructed in 1999 and Phase 2 in 2003.

In accordance with the Planning Permissions granted for the existing facility, the existing attenuation system is sized to cater for a storm event of 20 year return period and 2 hour duration.

The allowable surface water discharge rates stipulated by the Council for the Phase 1 and Phase 2 areas are as follows:

<b>PARAMETERS AGREED WITH SDCC FOR THE DESIGN OF THE SURFACE WATER ATTENUATION SYSTEM</b>		
	<b>SURFACE WATER RUN-OFF LIMIT</b>	<b>REFERENCE</b>
Phase 1	13.2 l/s/ha	S99A/C414 - Planning Condition 2(d)
Phase 2	6 l/s/ha	SD02A/0402 - Planning Condition 2

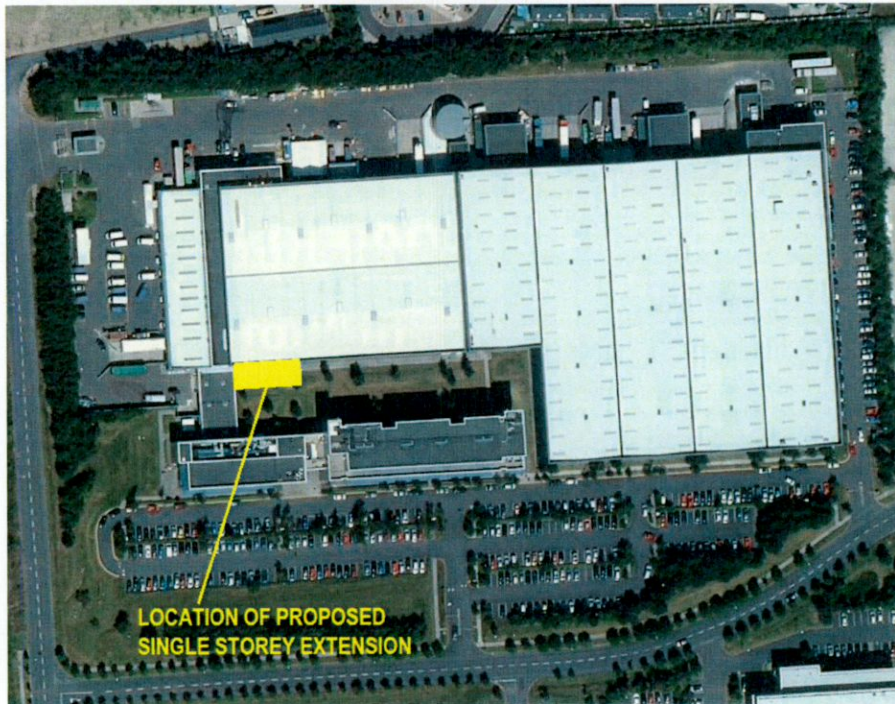
**3.6** Surface water attenuation calculations for the site are presented in Appendix 4. As noted in the calculations the effective surface water runoff limit for the entire site (i.e., Phase 1 and Phase 2 combined) is 9.7 l/s/ha.

**3.7** These calculations demonstrate that the existing drainage system has adequate capacity to accommodate the runoff from a storm with a 20 year return period and 2 hour duration.

CLIENT:	UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS PARK, D24	REF:	32120
PROJECT:	PROPOSED WAREHOUSE EXTENSION	DATE:	29 <sup>TH</sup> AUGUST 2022

## 4 DESCRIPTION OF THE PROPOSED DEVELOPMENT

- 4.1** The proposed 150m<sup>2</sup> extension will be located in a landscaped area between the Office Building and the Warehouses as indicated in Figure 2. The topography in this area consists of grass covered berms and mounds with mature trees. Photographs of the landscaped area are presented in Appendix 1.



**Figure 2: Location of the Proposed Warehouse Extension**

- 4.2** There is an existing underground surface water pipeline in the landscaped area, aligned parallel to the south elevation of the warehouse. A 21m long section of that drain is located within the site of the proposed extension.
- 4.3** In the area surrounding the new structure the existing topography and planting will be retained.  
A section of the existing footpath will be diverted to the south and east of the proposed extension.  
The section of the existing surface water drain located within the site of the extension will be retained in its current position and protection will be provided to it.

CLIENT:	UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS PARK, D24	REF:	32120
PROJECT:	PROPOSED WAREHOUSE EXTENSION	DATE:	29 <sup>TH</sup> AUGUST 2022

## 5 IRISH WATER

**5.1** The proposed structure is an extension to an existing warehouse. The purpose of the extension is to store goods. Consequently, no water supply connection is required or proposed for the new extension.

The *Irish Water Web Map* presented in Appendix 2 has been provided by the Water & Drainage Capital section of South Dublin County Council. The approximate location and extent of the proposed development is indicated on the plan. Please note the following:

1. The proposed development is 80m away from the nearest watermain to the west of the of the United Drug property.
2. As noted in the email from SDCC which accompanied the map, "*all drainage within Magna Park is private & the responsibility of the maintenance company*". The proposed development is 27m away from the nearest Business Park foul sewer located to the west of the of the United Drug property.

## 6 SURFACE WATER DRAINAGE ARRANGEMENTS FOR THE PROPOSED DEVELOPMENT

**6.1** For details of the proposed protection to the existing pipe within the site of the extension please refer to the drawing in Appendix 3.

**6.2** A green roof will be provided on the flat roof of the proposed extension. This roof will intercept and retain precipitation, reducing the volume of runoff and attenuating peak flows. Details of a typical green roof system are presented in Appendix 5.

**6.3** As noted above, the site is underlain by stiff boulder clay which is effectively impermeable and consequently the site is unsuitable for the use of infiltration devices to dispose of surface water run-off.

**6.4** A new surface water drain will be provided to convey the runoff from the green roof of the new extension to the existing surface water drainage network. A new surface water manhole will be constructed on the existing pipeline between surface water manholes SWMH 38 and SWMH40 to facilitate the connection of the new pipe.

**6.5** For details of the proposed surface water drainage arrangements for the new extension please refer to Henry J Lyons drawing number 950926 P0003 PROPOSED SITE LAYOUT PLAN DRAINAGE LAYOUT.

**6.6** The calculations in Appendix 4 demonstrate that surface water runoff from the proposed extension would have a negligible impact on the existing attenuation system.

---

**CLIENT:** UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

**REF:** 32120

---

**PROJECT:** PROPOSED WAREHOUSE EXTENSION

**DATE:** 29<sup>TH</sup> AUGUST 2022

---

**CLIENT:** UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

**REF:** 32120

---

**PROJECT:** PROPOSED WAREHOUSE EXTENSION

**DATE:** 29<sup>TH</sup> AUGUST 2022

**APPENDIX 1: Photographs of the Existing Landscaped Area**



**CLIENT:** UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS PARK, D24

**REF:** 32120

**PROJECT:** PROPOSED WAREHOUSE EXTENSION

**DATE:** 29<sup>TH</sup> AUGUST 2022



**Photograph 1**



**Photograph 2**

**CLIENT:** UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS PARK, D24

**REF:** 32120

**PROJECT:** PROPOSED WAREHOUSE EXTENSION

**DATE:** 29<sup>TH</sup> AUGUST 2022



**Photograph 3**



**Photograph 4**

---

**CLIENT:** UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

**REF:** 32120

---

**PROJECT:** PROPOSED WAREHOUSE EXTENSION

**DATE:** 29<sup>TH</sup> AUGUST 2022

**APPENDIX 2: Irish Water Web Map**



**CLIENT:** UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

**REF:** 32120

**PROJECT:** PROPOSED WAREHOUSE EXTENSION

**DATE:** 29<sup>TH</sup> AUGUST 2022

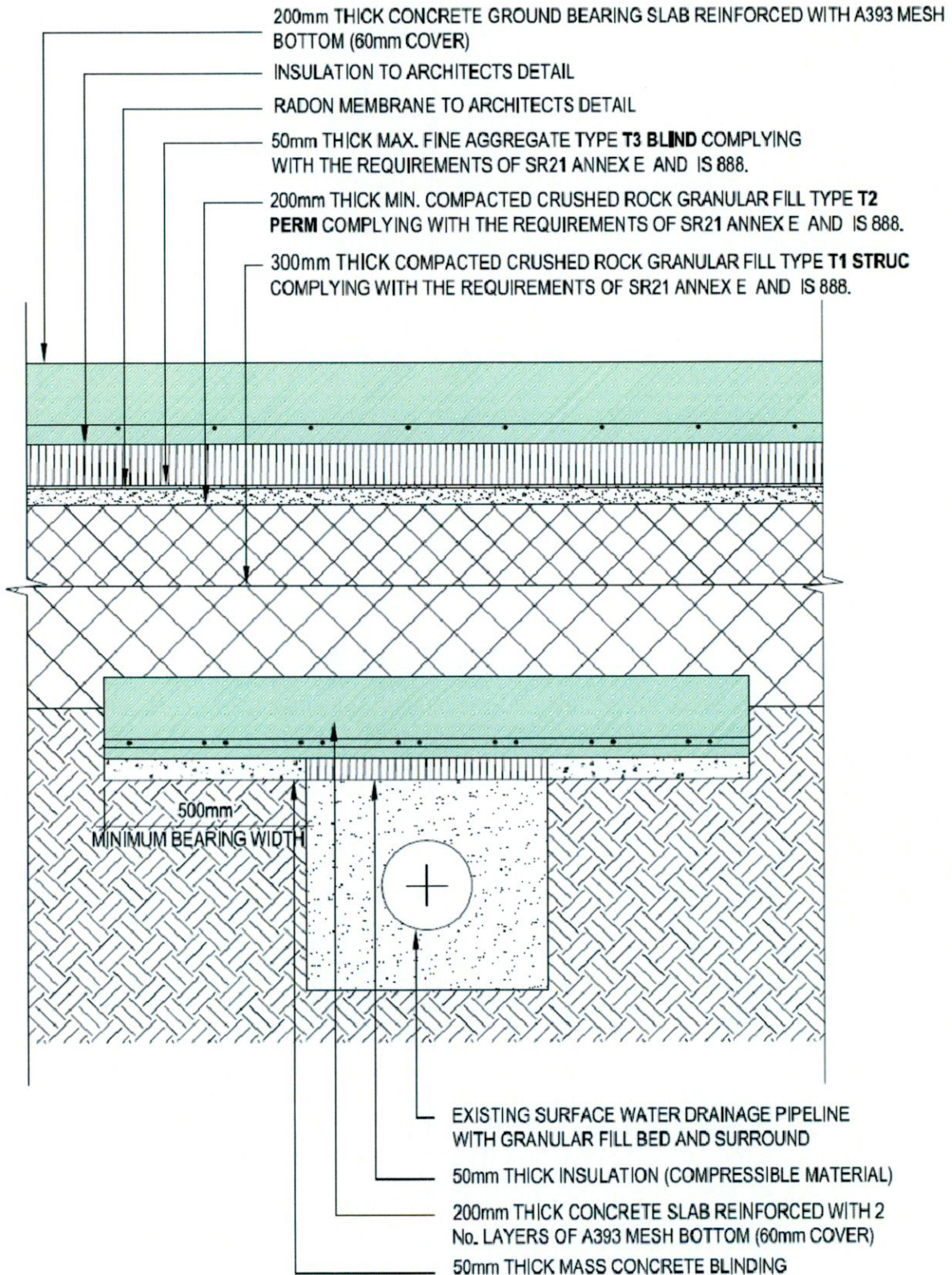
**APPENDIX 3: Details of Protection to an Existing Pipe under the Proposed Extension**

CLIENT: UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS PARK, D24

REF: 32120

PROJECT: PROPOSED WAREHOUSE EXTENSION

DATE: 29<sup>TH</sup> AUGUST 2022



**DETAILS OF PROTECTION TO EXISTING SURFACE WATER DRAIN BELOW THE PROPOSED EXTENSION**

---

**CLIENT:** UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

**REF:** 32120

---

**PROJECT:** PROPOSED WAREHOUSE EXTENSION

**DATE:** 29<sup>TH</sup> AUGUST 2022

**APPENDIX 4: Surface Water Attenuation Calculations**

CLIENT:	UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS PARK, D24	REF:	32120
PROJECT:	PROPOSED WAREHOUSE EXTENSION	DATE:	29 <sup>TH</sup> AUGUST 2022

### SURFACE WATER ATTENUATION CALCULATIONS

In accordance with planning permission granted for the existing facility, the system is designed to accommodate the runoff from a storm with a 20 Year Return Period and 2 Hour Duration

#### 1 CALCULATION OF SITE AREAS

TOTAL SITE AREA = 59,247m<sup>2</sup>

The existing facility was developed in two phases as follows:

- Phase 1, the western half of the site with an area of 3.02 hectares, was constructed in 1999, in accordance with the Planning Permission granted (Reg. Ref. S99A/C414).
- Phase 2, the remainder of the site with an area of 2.90 hectares was constructed in 2003, in accordance with the Planning Permission granted (Reg. Ref. SD02A/0402).

#### Phase 1 – Western part of Site

Warehouse	103 x 63 =	6,489
Link	12 x 26 =	312
Offices	41 x 15 =	615
South Car Park	47 x 129 =	6,063
West Service Yard	84 x 31 =	2,604
North Marshalling Yard	140 x 31 =	4,340
Landscaped Area		<u>9,771</u>
	PHASE 1 AREA	30,194

#### Phase 2 - Eastern part of Site

Warehouse	(103 x 102) + (25 x 62) =	12,056
Offices	(76 x 19) + (50 x 20) =	2,444
South Car Park	(33 x 61) + (16 x 55) =	2,893
East Road	17 x 125 =	2,125
North Marshalling Yard	145 x 31 =	4,495
Landscaped Area		<u>5,040</u>
	PHASE 2 AREA	29,053



CLIENT: UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

REF: 32120

PROJECT: PROPOSED WAREHOUSE EXTENSION

DATE: 29<sup>TH</sup> AUGUST 2022

## 2 SURFACE WATER DISCHARGE RATE

	ALLOWABLE DISCHARGE RATE PER HECTARE STIPULATED IN THE PLANNING PERMISSION GRANTED FOR EACH PHASE	Site Area
PHASE 1	13.2 l/s/ha	3.02ha
PHASE 2	6 l/s/ha	2.90ha

### EFFECTIVE ALLOWABLE DISCHARGE RATE FOR THE SITE

$$= ((13.2 \times 3.02) + (6 \times 2.90)) / 5.9247 = 9.7 \text{ l/s/ha}$$

## 3. CALCULATION OF NET EFFECTIVE IMPERMEABLE AREA

DESCRIPTION	AREA (m <sup>2</sup> )	IMPERMEABILITY FACTOR	IMPERMEABLE AREA (m <sup>2</sup> )
<b>Phase 1 -Western Part of Site</b>			
• Warehouse	6489	100%	6,489
• Link	312	100%	312
• Offices	615	100%	615
• South Car Park	6063	100%	6,063
• West Service Yard	2604	100%	2,604
• North Marshalling Yard	4340	100%	4,340
• Landscaped Area	9771	10%	977
<b>Phase 2 - Eastern Part of Site</b>			
• Warehouse	12056	100%	12,056
• Offices	2444	100%	2,444
• South Car Park	2893	100%	2,893
• East Road	2125	100%	2,125
• North Marshalling Yard	4495	100%	4,495
• Landscaped Area	5040	10%	504
<b>Total Site Area Developed</b>	<b>59,247</b>		<b>45,917</b>

## 4. ALLOWABLE DISCHARGE

$$\begin{aligned} \text{Allowable Discharge from Site} &= 9.7 \text{ l/s/ha} \\ &= 57.47 \text{ l/s, for a site of 5.9247 ha} \end{aligned}$$

$$\text{Total allowable discharge over 2 hours} = 57.47 \times (2 \times 60 \times 60) = 413,784 \text{ l} = 413.78 \text{ m}^3$$

CLIENT: UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

REF: 32120

PROJECT: PROPOSED WAREHOUSE EXTENSION

DATE: 29<sup>TH</sup> AUGUST 2022

**5. CALCULATION OF THE STORAGE VOLUME REQUIRED TO CATER FOR A STORM WITH A 20 YEAR RETURN PERIOD AND TWO HOUR DURATION** (based on information from Met Eireann)

**CASE A: Current layout**

DURATION	RAINFALL DEPTH (mm)	VOLUME OF RAINWATER RUNOFF (m <sup>3</sup> )	ATTENUATION VOLUME REQUIRED (m <sup>3</sup> )
2 hours	37.500	45,917 x 0.0375 = 1,721.89	1,721.89 - 413.78 = 1,308.11

Storage Volume required for a storm with a 20 year return period and 2 hour duration = 1,308.11m<sup>3</sup>

**CASE B: Proposed layout, including the New Extension (150m<sup>2</sup>)**

DURATION	RAINFALL DEPTH (mm)	VOLUME OF RAINWATER RUNOFF (m <sup>3</sup> )	ATTENUATION VOLUME (m <sup>3</sup> )
2 hours	37.500	(150 + 45,917) x 0.0375 = 1,727.51	1,727.51 - 413.78 = 1,313.73

Storage Volume required for a storm with a 20 year return period and 2 hour duration = 1,313.73m<sup>3</sup>

**6. STORAGE VOLUME FOR A STORM WITH A 20 YEAR RETURN PERIOD AND 2 HOUR DURATION**

VOLUME OF SURFACE WATER REQUIRED	VOLUME (m <sup>3</sup> )
Total Storage Volume Required for a storm with a 20 year return period and 2 hour duration	<b>1,308m<sup>3</sup></b>

VOLUME OF SURFACE WATER AVAILABLE	VOLUME (m <sup>3</sup> )
Storage Capacity of Attenuation Tank	598
Storage Capacity of Loading Docks	230
Storage Capacity of Manholes	116
Storage Capacity of Pipes	114
<b>TOTAL</b>	<b>1,058m<sup>3</sup></b>

The additional storage required is provided within the paved areas of the site

DESCRIPTION OF IMPERMEABLE PAVING	AREA (m <sup>2</sup> )
Existing Phase 1 Car Park Adjacent to Building	1,800
Existing Phase 1 West Service Yard	2,604
Existing North Phase 1 Marshalling Yard	4,340
Existing Phase 2 Car Park Adjacent to Building	1,200
Existing Phase 2 East Road	2,125
Existing North Phase 2 Marshalling Yard	4,495
<b>Total Area of Impermeable Paving</b>	<b>16,564m<sup>2</sup></b>

CLIENT: UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

REF: 32120

PROJECT: PROPOSED WAREHOUSE EXTENSION

DATE: 29<sup>TH</sup> AUGUST 2022

Depth of Temporary Flooding in Paved Areas:

Case A =  $((1308 - 1058)/16,564) \times 0.001 = 15.1\text{mm}$

Case B =  $((1314 - 1058)/16,564) \times 0.001 = 15.5\text{mm}$

**CONCLUSIONS:**

- As required under the Planning Permissions granted for the existing facility, the existing drainage system has adequate capacity to accommodate the runoff from a storm with a 20 year return period and 2 hour duration, discharged off site at a maximum rate of 9.7 l/s/ha.
- The additional storage volume required to accommodate the runoff from the proposed extension would be 6m<sup>3</sup> which has a negligible impact on the existing attenuation system.

---

**CLIENT:** UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS  
PARK, D24

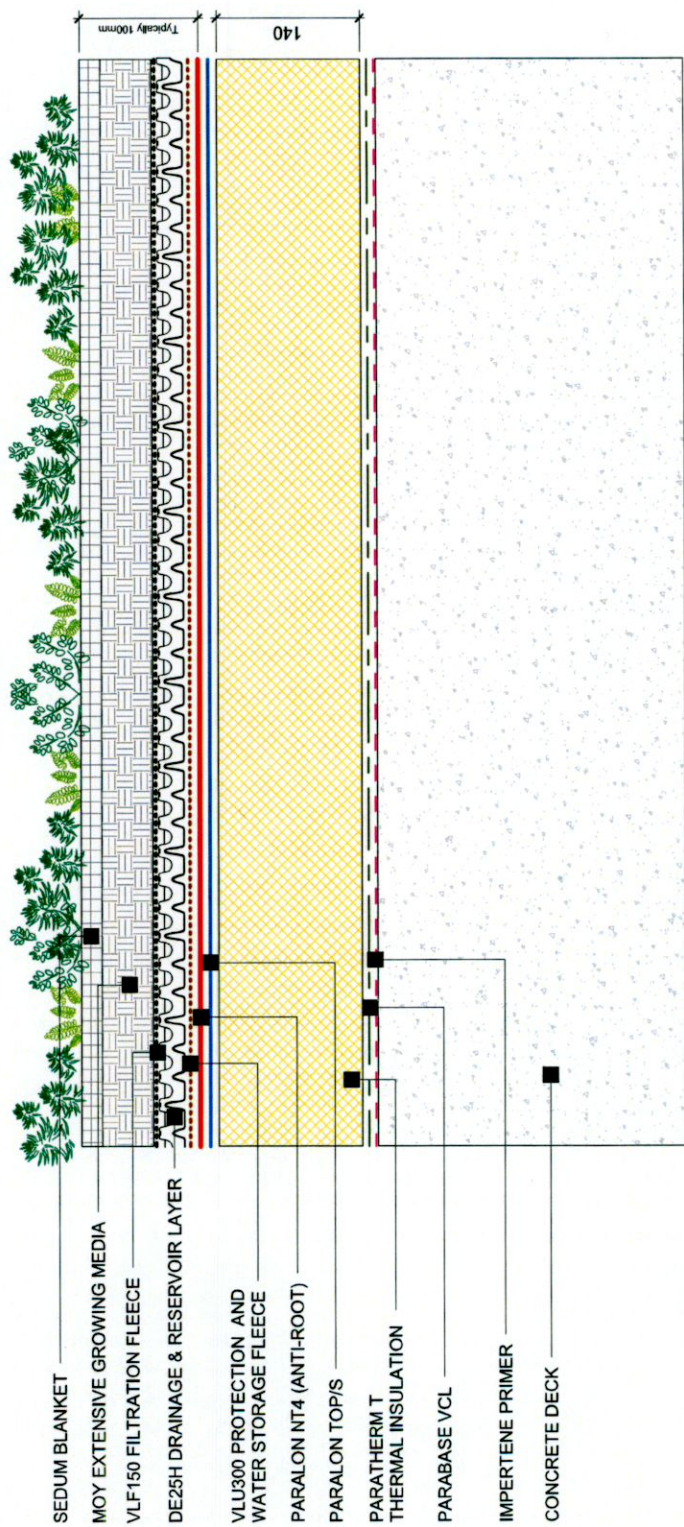
**REF:** 32120

---

**PROJECT:** PROPOSED WAREHOUSE EXTENSION

**DATE:** 29<sup>TH</sup> AUGUST 2022

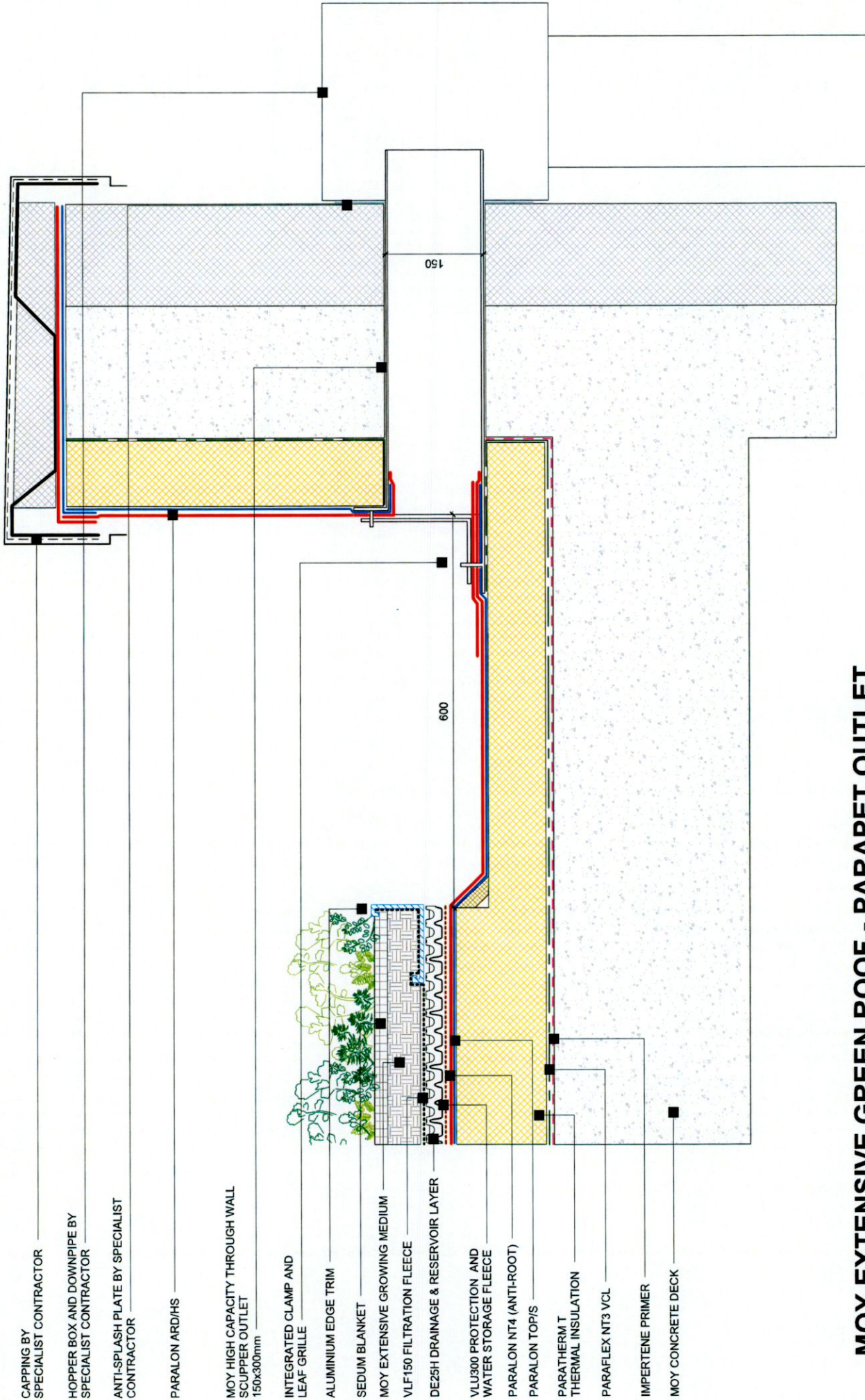
**APPENDIX 5: Details of Typical Green Roof Construction**



- SEDUM BLANKET
- MOY EXTENSIVE GROWING MEDIA
- VLF150 FILTRATION FLEECE
- DE25H DRAINAGE & RESERVOIR LAYER
- VLU300 PROTECTION AND WATER STORAGE FLEECE
- PARALON NT4 (ANTI-ROOT)
- PARALON TOP/S
- PARATHERM T THERMAL INSULATION
- PARABASE VCL
- IMPERTENE PRIMER
- CONCRETE DECK

**MOY EXTENSIVE GREEN ROOF SYSTEM (CONCRETE DECK)**

**1** 1:5



CAPPING BY  
SPECIALIST CONTRACTOR

HOPPER BOX AND DOWNPIPE BY  
SPECIALIST CONTRACTOR

ANTI-SPLASH PLATE BY SPECIALIST  
CONTRACTOR

PARALON ARD/HS

MOY HIGH CAPACITY THROUGH WALL  
SCUPPER OUTLET  
150x300mm

INTEGRATED CLAMP AND  
LEAF GRILLE

ALUMINIUM EDGE TRIM

SEDUM BLANKET

MOY EXTENSIVE GROWING MEDIUM

VLF150 FILTRATION FLEECE

DE25H DRAINAGE & RESERVOIR LAYER

VLU3000 PROTECTION AND  
WATER STORAGE FLEECE

PARALON NT4 (ANTI-ROOT)

PARALON TOP/IS

PARATHERM T  
THERMAL INSULATION

PARAFLEX NT3 VCL

IMPETENE PRIMER

MOY CONCRETE DECK

**MOY EXTENSIVE GREEN ROOF - PARAPET OUTLET  
DETAIL**

**7** 1:5