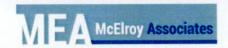


# ENGINEERS REPORT UNITED DRUG, MAGNA BUSINESS PARK, DUBLIN 24 PROPOSED WAREHOUSE EXTENSION 32120 30<sup>TH</sup> AUGUST 2022

Issued For	Final
Distribution	Architect
Revision	В



CLIENT: UNITED DRUG (WHOLESALE LTD), MAGNA BUSINESS REF: 32120

PARK, D24

PROJECT: PROPOSED WAREHOUSE EXTENSION DATE: 29<sup>TH</sup> AUGUST 2022

### 1 INTRODUCTION

An application for Planning Permission (Register Reference SD22A/0149) has been made for a single storey extension, with a floor area 150m², 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.

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### 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.
- 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.



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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:

	PARAMETERS AGREED WITH SDCC FOR THE DESIGN SURFACE WATER ATTENUATION SYSTEM						
t	SURFACE WATER RUN-OFF LIMIT	REFERENCE					
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.



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### 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.



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### 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 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.
- 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.
- 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.



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APPENDIX 1: Photographs of the Existing Landscaped Area



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Photograph 1



Photograph 2



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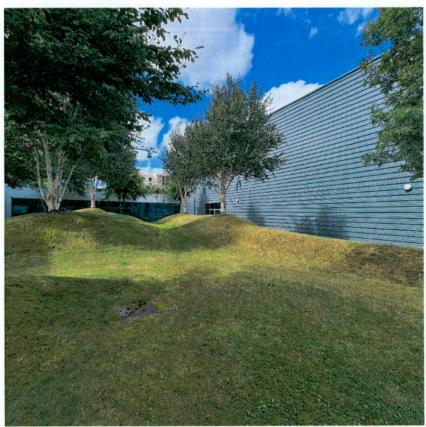
PROJECT: PROPOSED WAREHOUSE EXTENSION

REF:

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Photograph 3



Photograph 4



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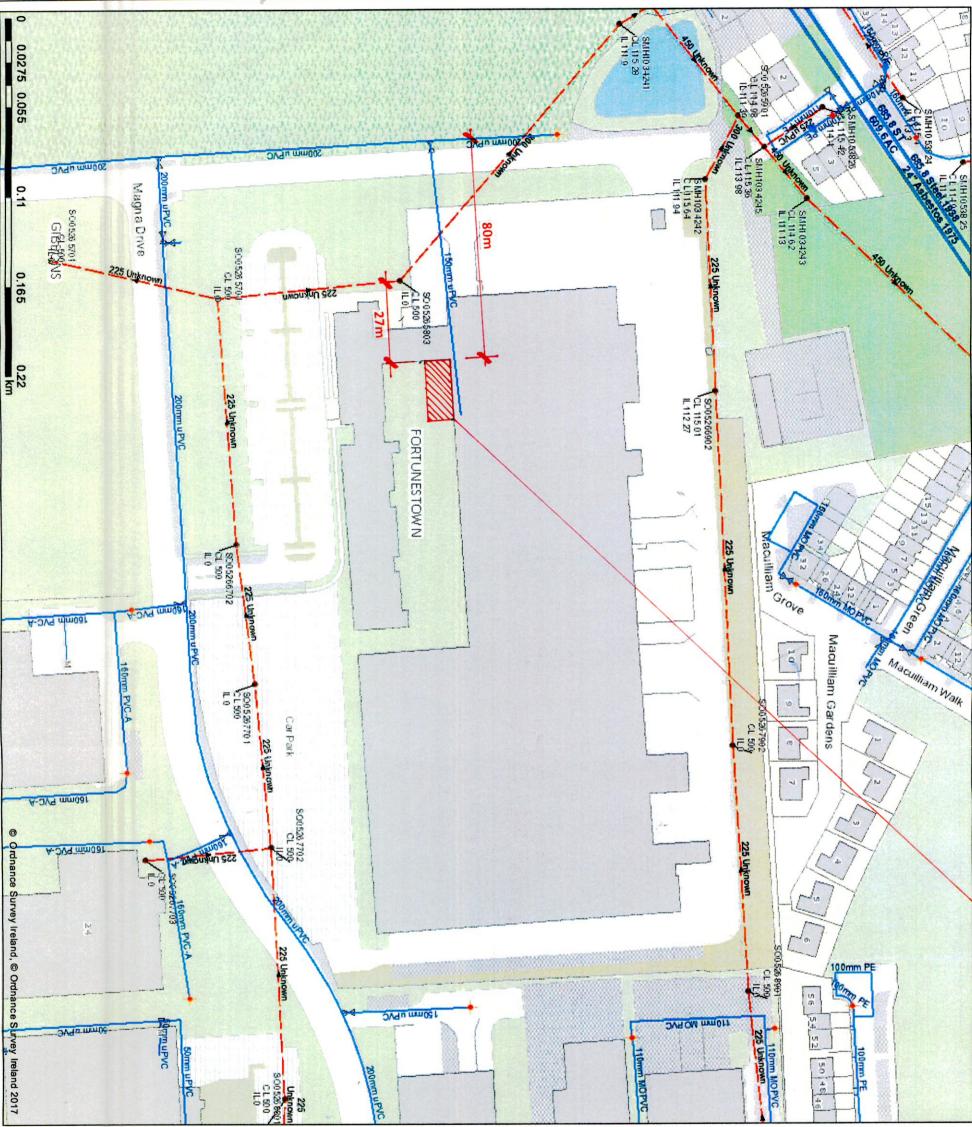
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APPENDIX 2: Irish Water Web Map

# Irish Water Web Map

OF THE PROPOSED DEVELOPMENT APPROXIMATE LOCATION AND EXTENT





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Code of Practice For Avoiding Danger From Underground Services' which is a valiable from the Health and Safety Authority (1880 28 83 89) or can be downbaded free of charge at www.has.ie."

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		- Com rimings	Differ Fillion	Residen	Cosp	Water Fittings	Fire Hydrant/Washout	THE THE PLANT	Else Hudrant	Pressure Monitoring Point	Weser Network Junctions	Water Distribution Chambers	Water Service Connections	⊗ Water Stop Valves	Double Air Control Valve	Sincle At Control Value	Butterfly Boundary valve openiclosed	⋈ Sluice Boundary Valve Open/Closed		Sluice Line Valve Open/Closed	DA PSV	DE PRV	Non-Return	8) Unknown Meter; Other Meter	Waste Meter	Source Meter	S Bulk/Check Meter	Boundary Meter	Water Abandoned Lines	Water Casings	Non IW	Water Lateral Lines	Private	High Water	Trunk Water Mains	Private	irish Water	Raw Water	Potable	Reservoir	M Telemetry Klosk	Abstraction Point	D STORY CHARLE	Meter Station	Posino Point	Stores California	Water Pump Station	★ Water Treatment Plant
	Other, Unknown	Vent/Col		Cont. Circumstant	orace Other: Linknown	Standard	Cettopa	5	Cuer, Crisnown	O Flushing Structure		RE Bodding Eve	Changut Type	Standard Outlet	Soekeway	Overflow	Outal		e Other Unknown	▲ Hydrobrake	Lamphole	(T) Hatchbox	Bifurcation	Catchpit	Cascade	O Backdrop	Sewer Manholes	Sewer Casings	Sewer Lateral Lines	Overflow	Syphon - Foul	Pumping - Unknown	Pumping - Foul	Pumping - Combined	Gravity - Unknown	Gravity - Combined	Sewer Mains Private	Overflow	Syphon - Foul	Syphon - Combined	Pumping - Foul	Pumping - Combined	Gravity - Unknown	Gravity - Foul	Gravity - Combined	Sewer Mains Irish Water	Waste Water Pump station	* Waste Water Treatment Plant
Waste Structure	Waste Point Feature Sewer	Whate Non Service Assets	♦ Water Structure		* Water Point Feature	Water Non Service Assets	Decommissioned	Old of Service	Hoposeo	Non Service Categories	ADMINOCHRO	MVLV Underground	LV Overhead Single Phase	LV Overhead Three Phase	MV Overhead Single Phase	ESB MYLY Lines	HV Abandoned	HV Overhead	HV Underground	ESB HV Lines	ECO National LOW Pressure Gesine	Distriction Medium Pressure Gastine	Transmission High Pressure Gasline	Gas Networks Ireland	o " d " " Other, Unknown			-) Outfall	Stormwater Chambers	Som Cean Cus	Storm Culverts	Other; Unknown	▲ Hydrobrake	Lamphole		O Biturcation	CP Catchoit	O Backdrop	<ul> <li>Standard</li> </ul>	Storm Manholes	O Other; Unknown	Standard	Inlet Type	Surface Water Pressurised Mains Private	Surface Water Pressurised Mains	Surface Gravity Mains Private	Surface Gravity Mains	Surface Water Mains



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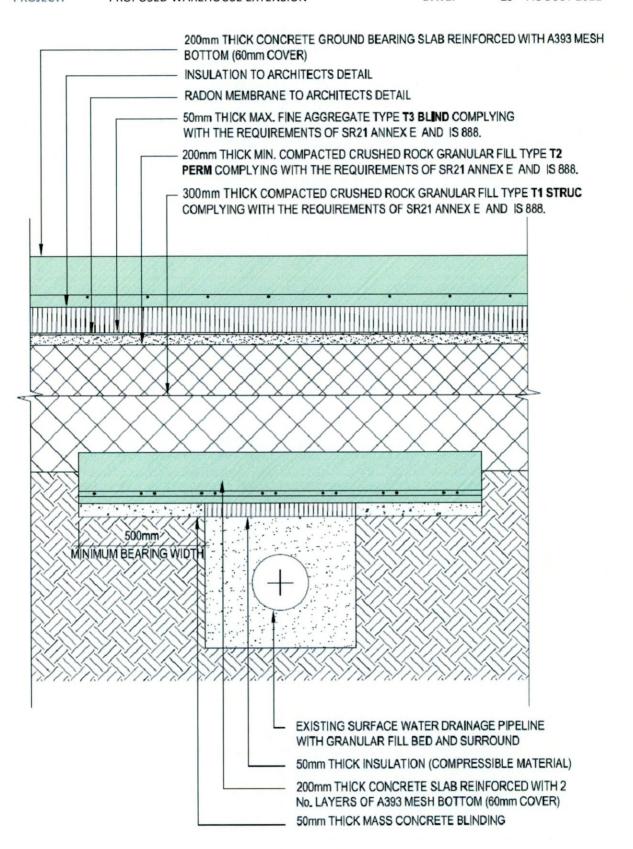
APPENDIX 3: Details of Protection to an Existing Pipe under the Proposed Extension



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



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**APPENDIX 4: Surface Water Attenuation Calculations** 



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



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### 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

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

### 3. CALCULATION OF NET EFFECTIVE IMPERMEABLE AREA

DESCRIPTION	AREA (m²)	IMPERMEABILITY FACTOR	IMPERMEABLE AREA (m²)
Phase 1 -Western Part of Site			
<ul> <li>Warehouse</li> </ul>	6489	100%	6,489
• Link	312	100%	312
<ul> <li>Offices</li> </ul>	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
Phase 2 - Eastern Part of Site			
<ul> <li>Warehouse</li> </ul>	12056	100%	12,056
<ul> <li>Offices</li> </ul>	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
Total Site Area Developed	59,247		45,917

### 4. ALLOWABLE DISCHARGE

Allowable Discharge from Site = 9.7 l/s/ha

= 57.47 l/s, for a site of 5.9247 ha

Total allowable discharge over 2 hours = 57.47 x (2 x 60 x 60) = 413,784 l = 413.78 m<sup>3</sup>



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# 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	VOLUME OF RAINWATER	ATTENUATION VOLUME REQUIRED
	DEPTH	RUNOFF	(m³)
	(mm)	(m³)	
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 (150m²)

DURATION	RAINFALL DEPTH (mm)	VOLUME OF RAINWATER RUNOFF (m³)	ATTENUATION VOLUME (m³)
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 (m³)
Total Storage Volume Required for a storm with a 20 year	
return period and 2 hour duration	1,308m³

VOLUME OF SURFACE WATER AVAILABLE	VOLUME (m³)
Storage Capacity of Attenuation Tank	598
Storage Capacity of Loading Docks	230
Storage Capacity of Manholes	116
Storage Capacity of Pipes	114
TOTAL	1,058m³

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

DESCRIPTION OF IMPERMEABLE PAVING	AREA (m²)
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
Total Area of Impermeable Paving	16,564m²



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Depth of Temporary Flooding in Paved Areas:

Case A = ((1308 - 1058)/16,564) x 0.001 = 15.1mm Case B = ((1314 - 1058)/16,564) x 0.001 = 15.5mm

### **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 6m³ which has a negligible impact on the existing attenuation system.

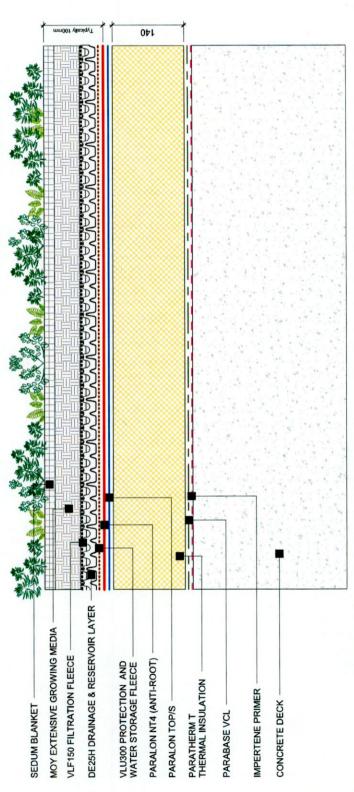


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**APPENDIX 5: Details of Typical Green Roof Construction** 



MOY EXTENSIVE GREEN ROOF SYSTEM (CONCRETE

1 DECK)

