



**KAVANAGH
MANSFIELD
& PARTNERS
CONSULTING
STRUCTURAL
AND CIVIL
ENGINEERS**

DRAINAGE DESIGN REPORT

**PROPOSED COVERED EXTERNAL AREA,
NEWLANDS GARDEN CENTRE,
NEW ROAD,
CLONDALKIN,
DUBLIN 22**

CT 2135

11 JULY 2022

(DRAFT)



INTRODUCTION

Kavanagh Mansfield & Partners were commissioned by Newlands Nurseries Ltd. to prepare a drainage design for the proposed covered external area at Newlands Garden Centre, Clondalkin as required under Condition 2 of South Dublin County Council planning application reference SD21A/0295 to include SuDS measures in the disposal of surface water.

The proposed development consists 916m² new canopy over an existing external retail area to the north of the existing a polytunnel structure. This report should be read in conjunction with the drawing in Appendix A (Proposed Drainage Layout).

STORM WATER DRAINAGE

The proposed works that influence the surface water drainage consists of:

- Canopy over an area of 33.7m (W) x 27.14m (L) consisting of galvanised steel support structure with grid reinforced transparent PE foil membrane

The existing area consist of the following:

- Non-permeable asphalt surface with gullies to drain surface water to the existing drainage network

The remaining area of the site is hard area consisting of buildings, polytunnels, external retail areas and car parking.

The gutters to the new canopy and rainwater down pipes will connect to the existing surface water drainage network within the site. The proposed arrangement does not change the extent of hard area currently draining to the existing drainage system and SuDS measures will reduce peak flow and volume entering the system.

SUDS MEASURES

The following SuDS measures are proposed:

- Rainwater harvesting system to collect rainfall run off from the canopy roofs for reuse within the site. The system can be either pumped or gravity fed

The garden centre has a large and regular water demand. The use of harvested rainwater for non-potable uses on the site will reduce the volume of runoff post development. Roof runoff pose a very low risk from contamination and the excess runoff that cannot be harvested will spill back into the existing drainage network.

As the proposed use of the area will remain as retail space and consist of a lightweight canopy roof, a number of SuDS measures are not feasible such as green roofs, rain gardens or tree pits. Also, Infiltration to groundwater will not be possible as the columns to the canopy structure are in a grid of approx. 5.0m x 4.8m and infiltration is not advised less than 5m from structures due to the potential to adversely affect foundations.

RAINWATER HARVESTING SYSTEM

Estimate demand (of non-potable water)

Garden centre use	
Volume used for daily activity	5000 l
Total annual demand, Dn =	1825000 l

Estimate yield (runoff from canopy roof)

$$Y_r = A.e.AAR.n$$



Yr = runoff volume (yield) (l)
A = collecting runoff area (m²)
e = runoff (yield) coefficient
AAR = average annual rainfall depth (mm)
n = hydraulic filter efficiency (ratio)

Roof area =	916	m ²
Annual average rainfall =	813	mm
Roof runoff coefficient =	0.95	
Filter coefficient =	0.9	

Total annual yield, Yr = 636725.34 l

Yield:Deman ratio, Yr/Dn = 0.35

The Yr/Dn ratio should be < 0.95 for effective surface water management (OK)

Therefore, the demand (volume to be used) will exceed the yield (runoff volume from the roof).

CONCLUSIONS:

Based on the site history and flood map records, the proposed SuDS measures will, as far as reasonably practicable, reduce pluvial flood risk on the proposed development and surrounding properties and reduce water demand.

John Kelly

for

KAVANAGH MANSFIELD & PARTNERS

Consulting Engineers



APPENDIX A
DRAINAGE LAYOUT



APPENDIX B
GREENFIELD RUNOFF RATE ESTIMATE



APPENDIX C
FLOOD REPORTS



APPENDIX D
EXISTING PUBLIC DRAINAGE MAPS



APPENDIX E
MET EIREANN RAINFALL DATA