STORMWATER OPERATIONS & MAINTENANCE MANUAL

FOR

192 NARELLAN ROAD (LOT 4), CAMPBELLTOWN – STAGES 1 TO 4

PROJECT TITLE: 192 Narellan Road (Lot 4), Campbelltown – Stages 1 to 4

PROJECT NUMBER: 7663

PREPARED FOR: Clearstate CamNarr192 Pty Ltd c/o Clearstate Development Co

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Base Template:	Version B June 2020

External Issue

Revision Control Register		
Version No:	**Issue Date:**	**Issued For:**
1	05/07/2021	Issued for Development Application

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1. INTRODUCTION

Indesco has prepared this Stormwater Operations & Maintenance Manual on behalf of Clearstate CamNarr192 Pty Ltd (the Proponent) in support of the development applications for the proposed development of Stages 1-4 of 192 Narellan Road (Lot 4), Campbelltown (the Site), as shown in the figure below.

Site Locality

The stormwater quantity and quality infrastructure proposed as part of the proposed development is listed below and is shown on Indesco's drawings:

- Bioretention Basin/Raingarden (1x temporary and 1x permanent)
- On-Site Detention Basin (1x permanent)
- Gross Pollutant Trap (1x permanent)
- Grassed Swale (1x permanent)

Ongoing maintenance is required to ensure that the infrastructure continues to perform its designed function in the control of stormwater quantity and quality.

Ongoing review of the maintenance measures provided in this report are required. This is the responsibility of the maintenance contractor and its employer. This may necessitate augmentation of those measures proposed hereunder to ensure the ongoing efficacy of the system.

2. MAINTENANCE SCHEDULE

Activity	Purpose	Frequency & Action
Gross Pollutant Traps		
1. Vacuum truck maintenance 2. Inspections	To ensure GPT operates as designed	Inspect 1 - 4 times per year and after each major storm event with minor maintenance as required. Major maintenance as required. For more information refer to manufacturer maintenance manual.
Stormwater Pits & Miscellaneous Basin Infrastructure		
Removal of rubbish and silt from pits, grated drains, orifice plate and trash screen	To prevent downstream pollution and to ensure system functions as designed	Inspect 1 - 4 times per year and after each major storm event with maintenance as required.
Remove any slime on grates	To prevent slip hazard and to minimise corrosion of grate	Inspect 1 - 4 times per year with maintenance as required.
Maintain ground levels around all pits	To ensure water can freely enter pit	Inspect 1 - 4 times per year and after each major storm event with maintenance as required.
Survey pipe condition with CCTV's and repair defects as necessary	To identify any cracks, silt build-up, tree root progress, joint failure etc	Once every 5 years.
Ensure pit covers are secure	To prevent safety hazard	Inspect 1 - 4 times per year with maintenance as required.
Bioretention Filter, Planting, Subsoil Drainage		
Regular watering of plants during establishment phase.	To ensure bio-filtration operates as designed	Once every month until vegetation reaches mature state, and then once every 6 months or as required
Remove weeds in bio-filtration basins	To ensure bio-filtration operates as designed	Once every month until vegetation reaches mature state, and then once every 6 months or as required.
Tilling of the bioretention trench surface.	To ensure bio-filtration operates as designed	Inspect 2 times per year and after each major storm event with maintenance if there is evidence of clogging.
Inspection and removal of sediment/silt and rubbish, re-profiling and re-vegetating.	To ensure bio-filtration operates as designed.	Inspect 2 times per year and after each major storm event with maintenance if there is evidence of sediment deposition. Extended periods of water ponding may indicate an issue. If removal of sediment/silt/rubbish is does not resolve extended periods of ponding, then filter media may need to be excavated and replaced.

Activity	Purpose	Frequency & Action
Inspection of inlet points, look for scour, litter, build up and blockages around pits.	To ensure bio-filtration operates as designed.	Inspect 2 times per year and after each major storm event with maintenance if there is evidence of sediment deposition.
Retaining Walls Associated with Basins		
Check subsoil behind retaining walls drainage capacity via hose flushing	To ensure retaining wall backfill contains to drain freely	Once per year. If little or no water is entering the downstream connecting pit, a small sewer CCTV camera may be required to determine problem areas.
Batters, Open Drains & Associated Infrastructure		
Check batters for signs of scour and erosion	To prevent scour/erosion	Inspect once per year and after each major storm event with maintenance if there is evidence of scour and erosion. Revegetate and regrade problem areas. If problem continues in the same area rock lining may be required.
Check head wall outlet and downstream scour protection devices for signs of scour and erosion	To prevent scour/erosion and bank destabilisation	Inspect once per year and after each major storm event with maintenance if there is evidence of scour and erosion. Revegetate and regrade problem areas. If problem continues in the same area rock lining may be required.
Maintain overland flow paths/swales upstream/downstream of basin	To prevent localised flooding	Inspect 1 - 4 times per year and after each major storm event with maintenance as required. Remove silt build up and rubbish. Trim or replace vegetation or re-grade swale /path if required.

3. MAINTENANCE CHECKLIST

Site	
Inspection Date	
Inspected by (Name & Position)	
Company	
Details of Event Preceding Inspection (e.g. storm duration/rainfall recorded if applicable)	

Activity	Date Inspected	Condition	Rectification Works Required
Gross Pollutant Trap			
1. Vacuum Truck maintenance 2. Inspection			
Stormwater Pits & Miscellaneous Basin Infrastructure			
Removal of rubbish and silt from pits, grated drains, orifice plate and trash screen			
Remove any slime on grates			
Maintain ground levels around all pits			
Survey pipe condition with CCTV's and repair defects as necessary			
Replace wheelchair covers to pits when corroded.			
Ensure pit covers are secure			

Activity	Date Inspected	Condition	Rectification Works Required
Bioretention Filter, Planting, Subsoil Drainage			
Regular watering of plants during establishment phase.			
Remove weeds in bio-filtration basins			
Tilling of the bioretention trench surface.			
Inspection and removal of sediment/silt and rubbish, re-profiling and re-vegetating.			
Inspection of inlet points, look for scour, litter, build up and blockages around pits.			
Retaining Walls Associated with Basins			
Check subsoil behind retaining walls drainage capacity via hose flushing			
Batters, Open Drains & Associated Infrastructure			
Check batters for signs of scour and erosion			
Check head wall outlet and downstream scour protection devices for signs of scour and erosion			
Maintain overland flow paths/swales upstream/downstream of basin			