



**NAVAL BASE CONCRETE
DILUTION UNIT INSTALLATION, OPERATION,
AND MAINTENANCE MANUAL**

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DOCUMENT CONTROL FORM

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PREPARATION, REVIEW AND AUTHORISATION

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REVISION CHANGES

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Revision A	Initial document issue
Revision B	Review document for accuracy and re-approval submission

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1.0 BACKGROUND

Discharge directed into the Water Corporation's wastewater collection system is required to meet water quality standards to protect the wastewater system from incompatible materials that can cause blockages, corrosion, toxic gasses, and potential negative impact on wastewater re-use.

The purpose of the use of a dilution unit is to control the pH level of discharge into the Water Corporations wastewater collection system. It is permitted for wastewater between a pH of 6.0 and 10.0 to be discharged into the wastewater collection system. Dilution units are designed to be a pre-treatment apparatus to capture and treat all flow directed into the units.

These pits work by utilizing a large volume of water as a dilution media. High or low pH discharge enters this water volume and become substantially diluted. The water in the dilution pit may be dosed with either an acidic or alkaline solution to neutralise the pH level should this deviate too far from neutral.

2.0 INSTALLATION GUIDELINES

Dilution unit shall be installed in accordance to David Wills and Associates drawings S-01, S-02, and S-03 attached in Appendix A. The dilution unit has four lifting points which shall be utilized to transport the unit.

2.1 Foundation and Backfill Requirements

Backfill surrounding the dilution unit shall be one of the following soil types:

- a. Manufactured aggregate of open grade and clean material;
- b. Manufactured processed aggregate of dense grade and clean material;
- c. Clean coarse grained soils, classification in reference to AS1726 being; GW, GP, SW, and SP, or
- d. Coarse grained soils with fines of category GM, GC, SM, and SC.

Backfill around the concrete dilution unit shall be compacted to a minimum modified dry density of 90% (MMDD), equal to 14 to 24 blows when using a standard Perth Sands Penetrometer (PSP). This backfill shall extend a minimum of 300mm horizontally, or suitable distance to allow use of a compactor, from the outside perimeter of the dilution unit for the full height of the unit.

Backfill shall be placed and compacted in layers of 300mm around the dilution unit. Adequate compaction shall be achieved universally around the unit and it shall be ensured that water is added during compaction to assist the process.

Units shall be installed on a stable base consisting of one of the following soil types:

- a. Clean manufactured aggregates of open grade containing little or no fines;
- b. Clean manufactured open aggregate dense grade angular crushed stone and stone/sand mixes.

The foundation below the dilution pit base shall be compacted to achieve a minimum compaction of 90% Maximum Modified Dry Density (MMDD). This foundation shall be free of rocks, vegetation and other deleterious matter.

Installation of dilution units shall not exceed the installation depths specified on David Wills and Associates drawing 00036.01 S-02 in Appendix A.

2.1 Maximum Allowable Loads

Dilution units are provided with a gas tight cover having a load rating of either Class A or Class C, as defined below:

- a. Class A covers shall only be used in pedestrian areas, and
- b. Class C covers shall be located in areas subject to slow moving traffic only. The maximum nominal wheel load shall not exceed 7,500kg.

3.0 HANDLING AND LIFTING PROCEDURES

Transport of the dilution units shall be undertaken using safe practice. Four lifting points are cast into the units on each top corner, which are rated to 1.35 tonne each. Lifting chains or straps shall be connected to all four lifting points when moving the units.

Appropriate lifting equipment shall be utilised to lift these units, having adequate tensile capacity ratings. Each dilution unit weighs approximately 3 tonnes, see David Wills and Associates drawing 00036.01 S-01 for individual component weights.

4.0 OPERATION GUIDELINES

The dilution unit is required to operate between a pH level of 6.0 and 10.0 to discharge into the Water Corporation Trade Waste system. The dilution pit shall be initially filled with potable water to the invert of the outlet pipe prior to its first use.

The discharge from the unit outlet shall be monitored during use to ensure the pH levels are between the allowable limits. Should these pH levels be too acidic, then manual or automatic dosing shall be undertaken using a 50% sodium hydroxide solution or similar. If the outlet pH levels are too alkaline, a 98% sulphuric acid solution or similar shall be used to manually or automatically dose the unit contents.

5.0 MAINTENANCE MANAGEMENT

The dilution unit should be pumped out and cleaned at least every three months, depending on the nature of the wastewater and inflow quantities into the unit. It may be necessary to re-assess the pump out intervals during the initial use of the unit to determine how regular pump outs are required.

Depending on the wastewater nature, the pumped out solution can either be disposed of in landfill or an appropriate liquid waste plant.

6.0 TANK MANUFACTURER CONTACT INFORMATION

Tanks are manufactured and supplied by Naval Base Concrete:

Address: 23 Beach Street Kwinana, Western Australia, 6167

Phone: (08) 9439 3933

Website: <http://www.navalbaseconcrete.com.au/>