Rigid Pavement Design and Construction – A look at what lies underneath

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Outline of Rigid “Subterranean” Issues

- Typical Rigid Pavement Structure
- Subgrade Preparation
- Proofrolling
- Subgrade Drainage
- Subbase and Crushed Granular Base
- Cement Stabilized Base
- Pavement Joints and Load Transfer

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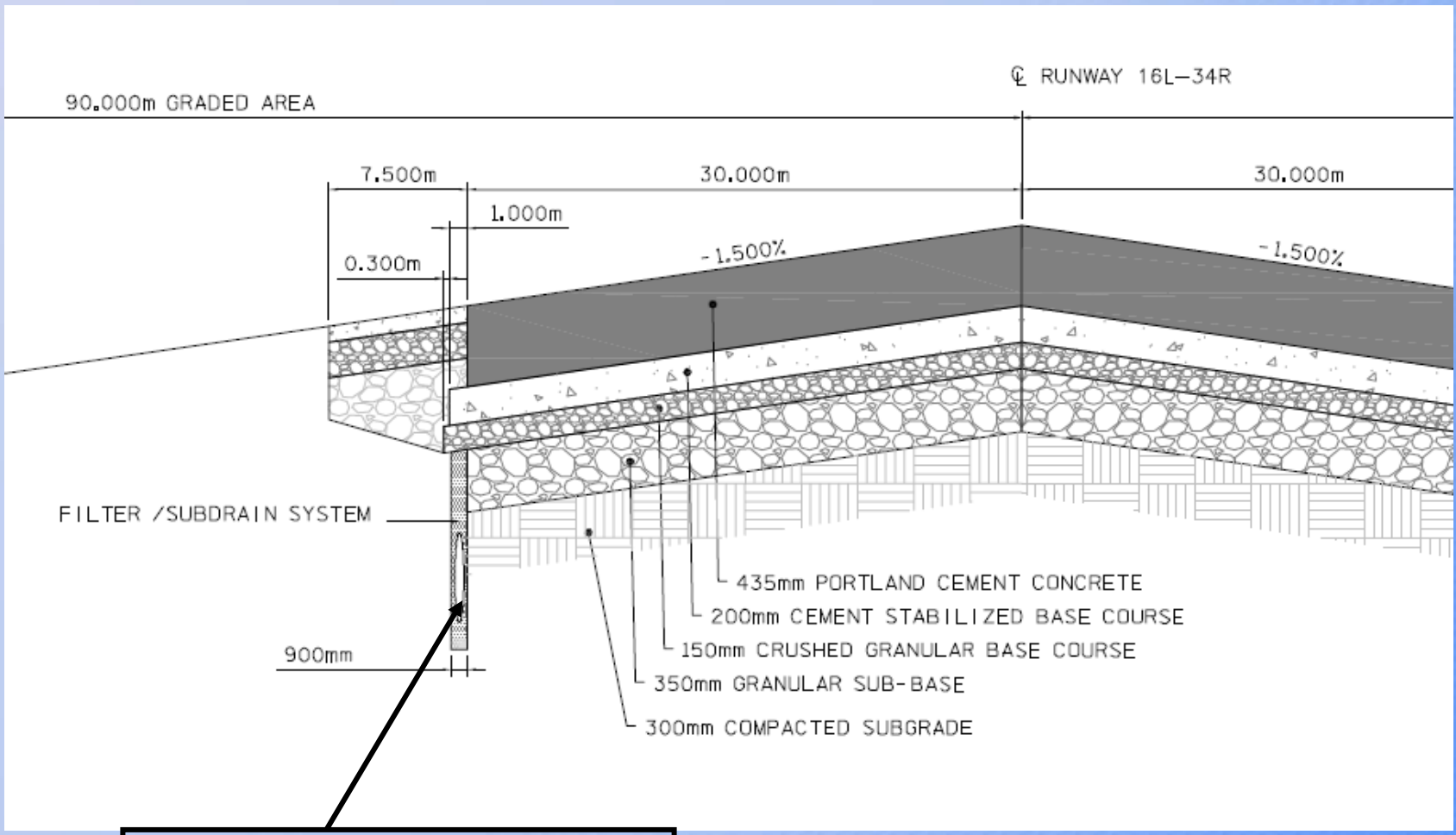
Typical Rigid Pavement Section



Good for Rwy/Twy but edge subdrains not very effective on large apron areas

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Typical Subgrade Preparation Issues

- PCC less sensitive to subgrade strength but remember the 3 most important items in pavement design: “water, water, water”

  - control it and you have a durable pavement
- Subgrade compaction target 95%(93%) MPDD in cohesive soils and 98% in cohesionless soils.
- Stabilization – geogrids and geotextiles

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Proofroll your Subgrade – 100,000lbs

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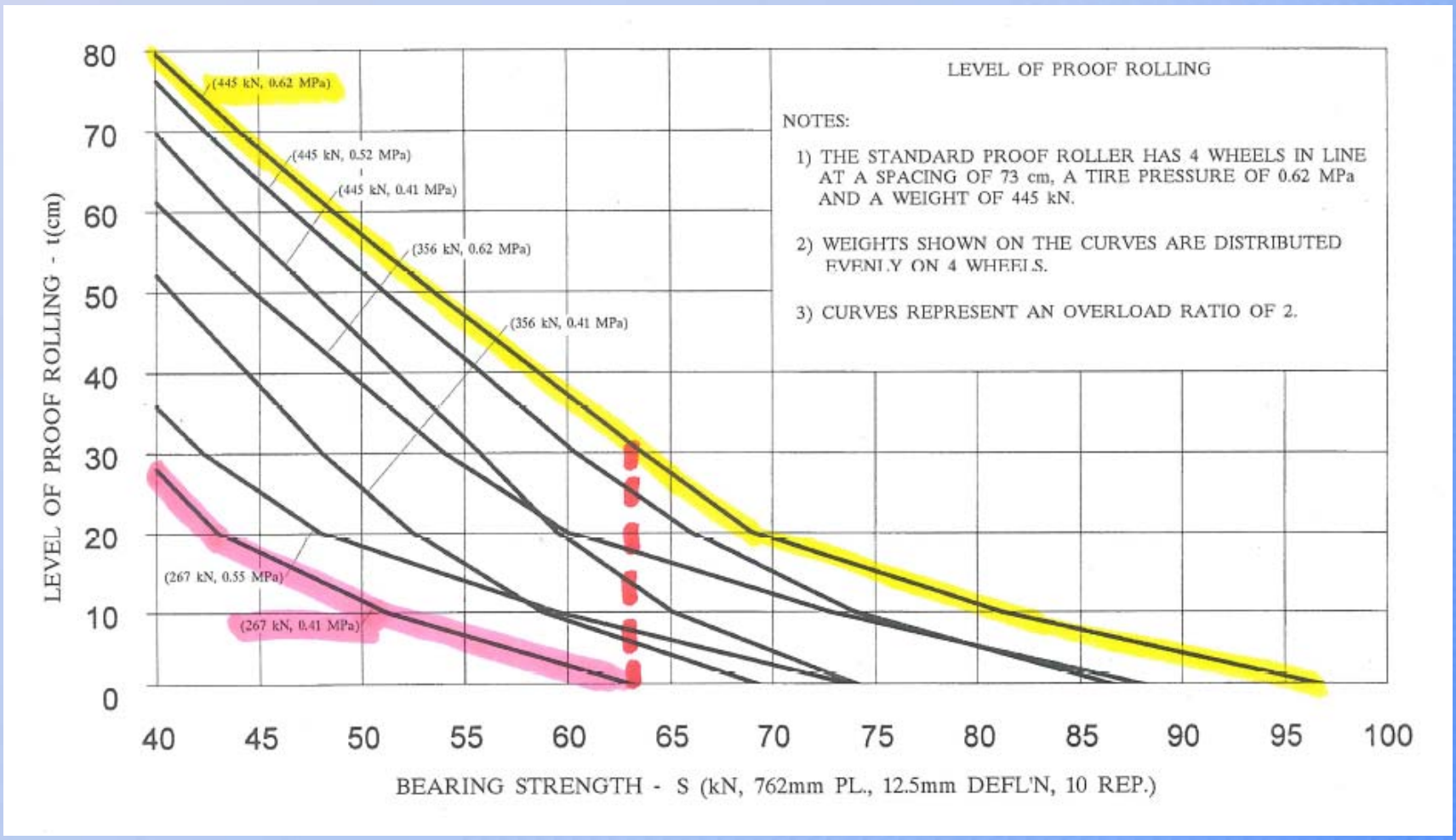
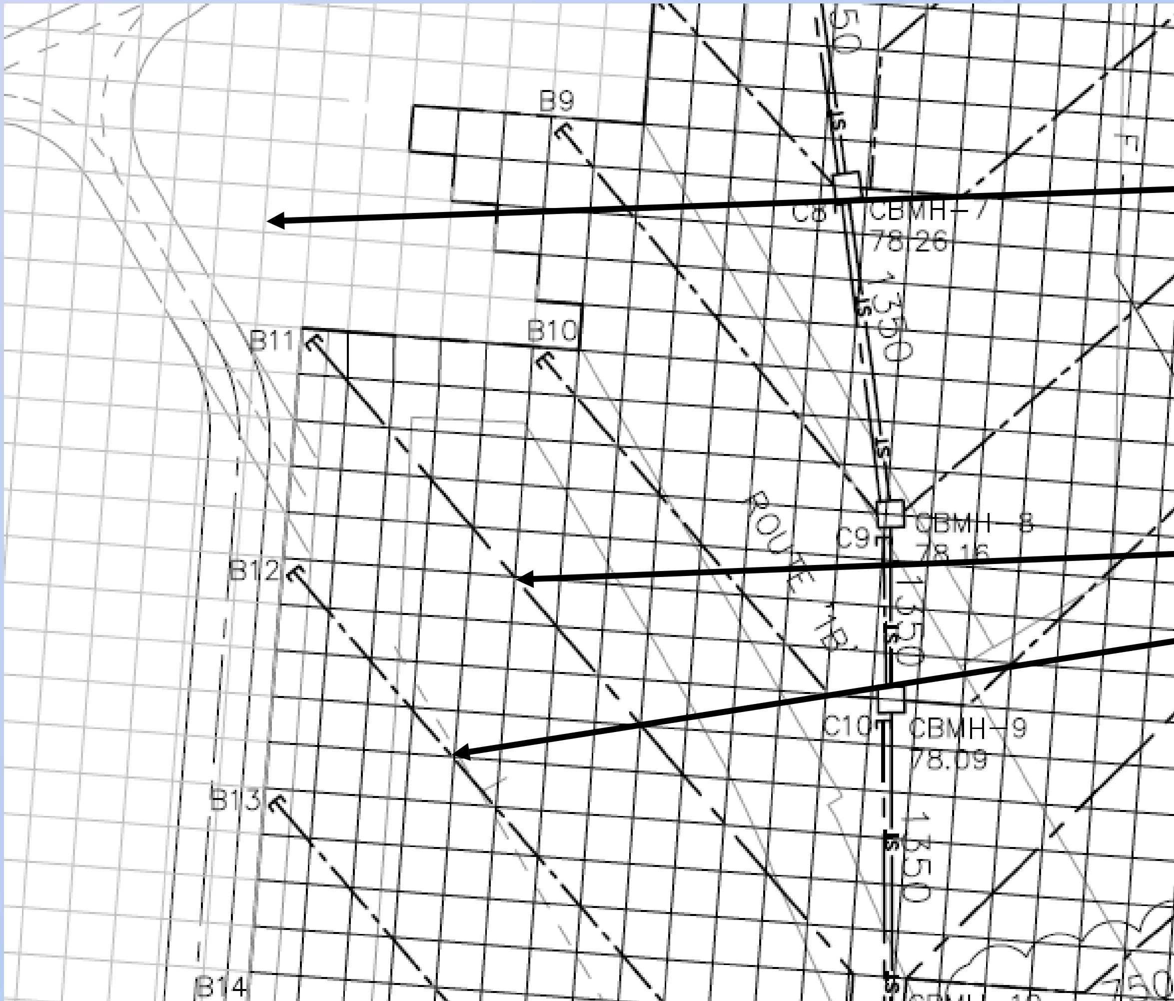
Level of Proofrolling*



* (Source – AK-77-68-300)

Rigid Pavement Apron Subdrains



Existing Apron with No Interior Subdrains

New Apron with “Herring Bone” Pattern Interior Subdrains

Pearson T1 Stage 1 Apron Subdrains

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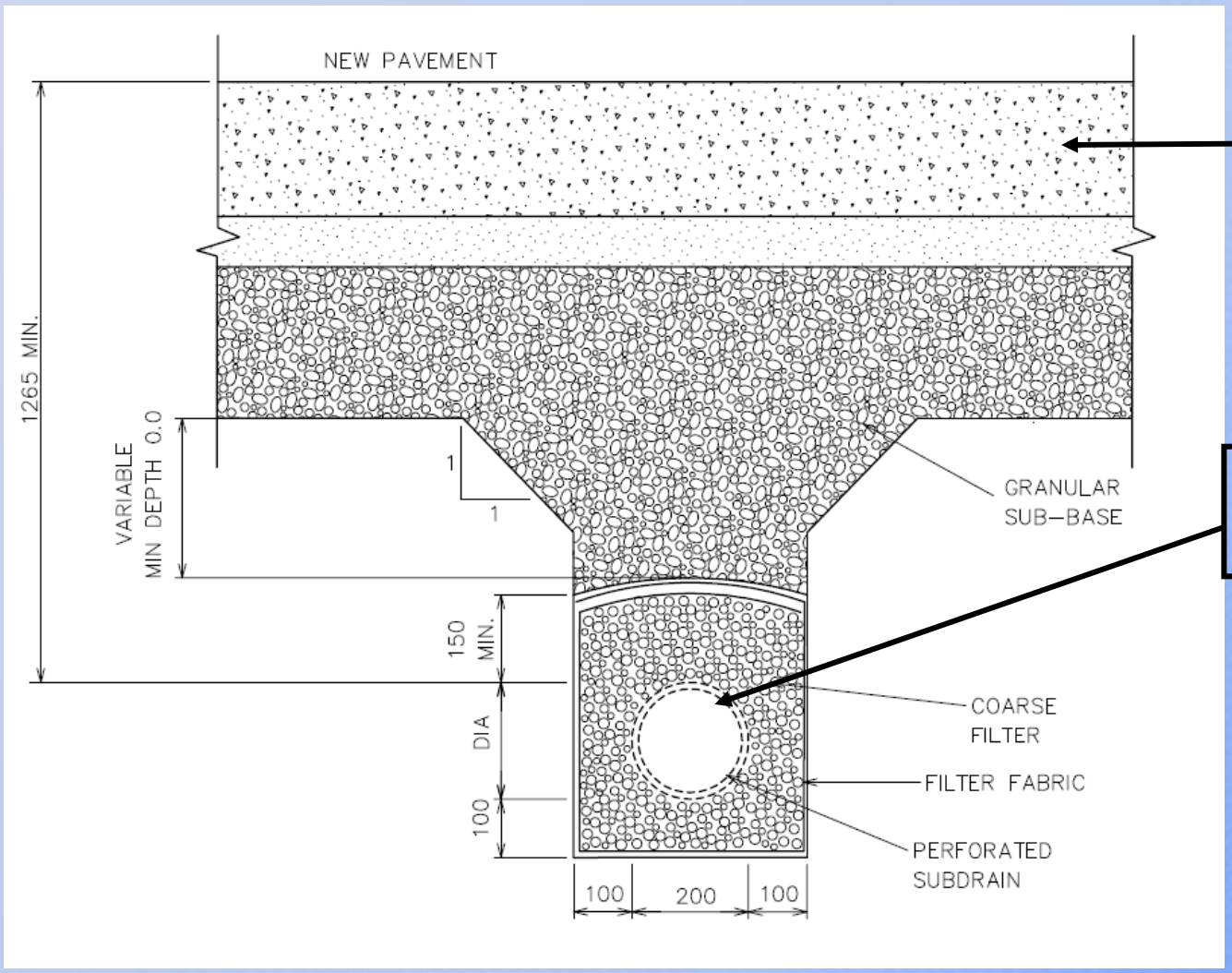
Herring Bone Subdrain – Typical Section



PCC Pavement

"Herring Bone" Pattern
Interior Subdrains

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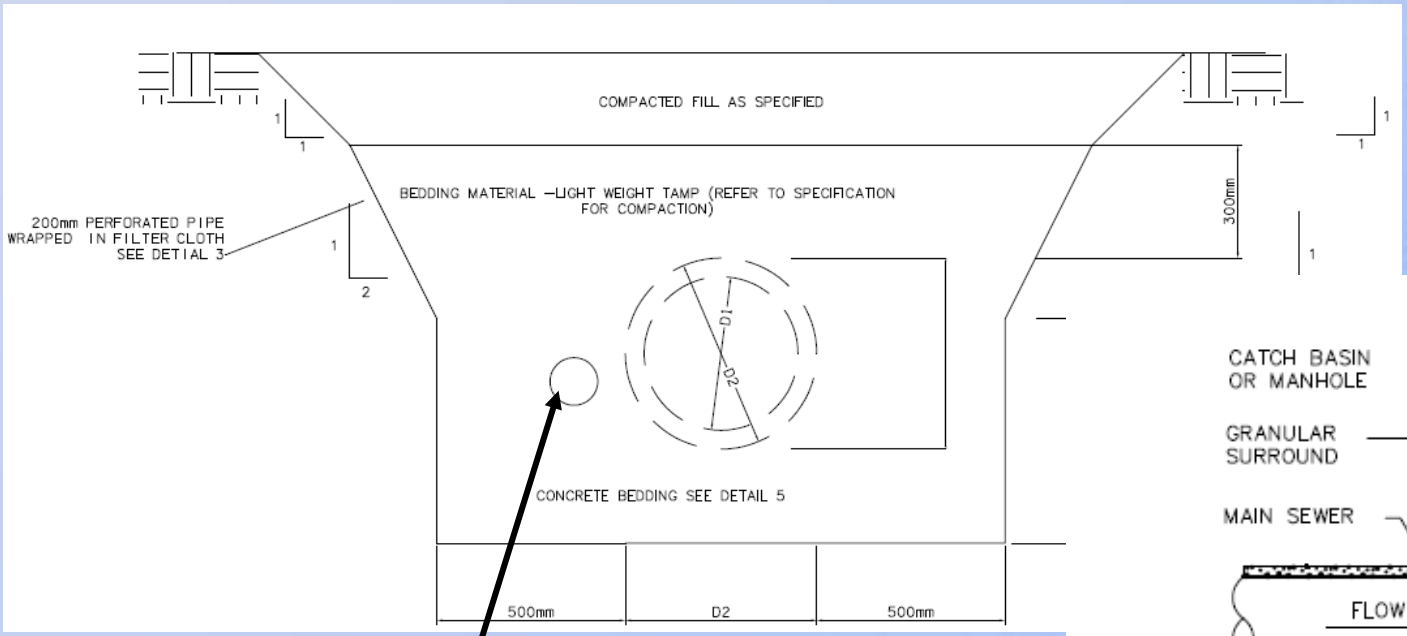
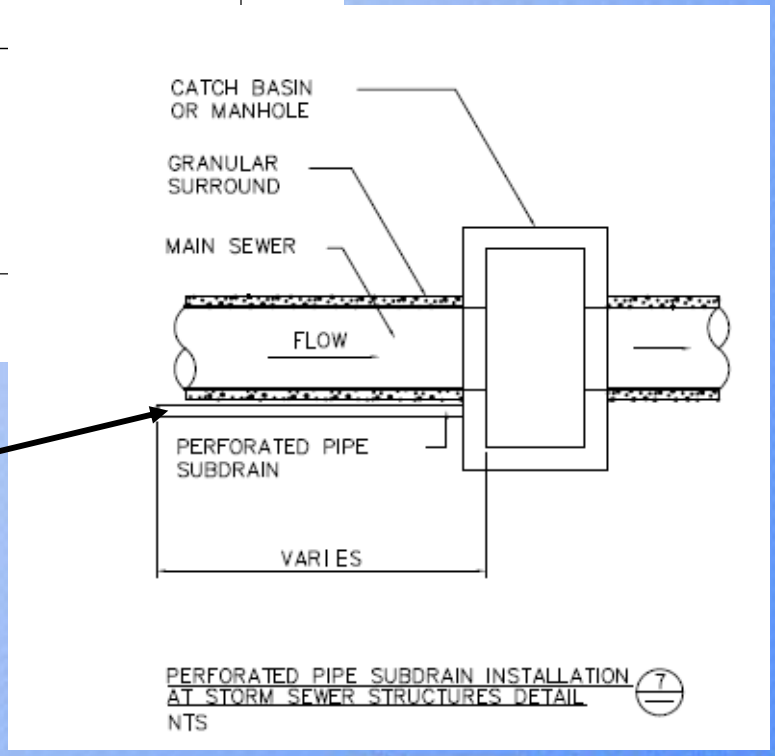
Drain your Storm Drainage Backfill





Perforated Pipe Subdrain
In Storm Drainage Backfill

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Subbase and Crushed Granular Base

- Subbase usually the granular layer required to make up the minimum level of frost protection – typically total pavement structure at least 50% of frost penetration depth at Canadian airports to 65% in USA (FAA)
- Crushed granular to provide more stable working platform for stabilized layer placement and PCC
- Many international jurisdictions skip granular base course and just use subbase

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Cement Stabilized Base Course

- Stabilized base course (either by cement or asphalt) is mandatory in USA for all pavements with aircraft loadings over 100,000 lbs (43,359 kg). In Canada ASG-19 notation is for ”larger projects at international airports” and 200 mm minimum thickness under rigid pavements.
- Achieve minimum compressive strength of 3 MPa (435 psi) at 7 days to maximum 7 MPa (1000) at 28 days – this is **stabilized** “base course” so compaction to 98% MPDD is critical. The stabilization is required for long term performance for load transfer at joints.

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CSB by Spreader – the best way

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CSB Controlled Cracking

CSB by Spreader under PCC

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Rigid Pavement – Joints and Lights

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Rigid Pavm’t – Odd Panels and Reinforcing

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Inset Lights, Construction Dowels and Contraction Dowel Baskets

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Completed PCC Surface

THANK YOU!

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