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BRANCH OF DOAA COMPANY

SUB BASE

Class A Sub base shall consist of well graded gravel with sand and silt.

Class B Sub base shall consist of a uniform mixture of gravel and/or stone fragments with sand, silt, and clay. Below Table indicates the test specifications

Sieve Size	% Passing
51.0	100
37.5	90-100
19.0	50-85
6.7	40-80
2.36	35-70

STRUCTURAL FILL (SUB BASE)

Structural Fill is fill or backfill placed beneath immediately surrounding footings, grade beams or mats or beneath slabs, buildings, roads, paved areas and parking areas. This shall meet the requirements given in this Section or Section.

Fill and backfill to be used as Structural Fill shall be gravel, sand or a mixture of these constituents. Except for sands or gravels that exhibit no plasticity characteristics, the material shall meet the following characteristics:

Liquid limit (LL): 35 maximum and Plasticity index (PI): 12 maximum.

Well Graded Sand A well graded sand, by definition shall comprise Clean Sand with less than 5% fines (silt or clay size particles) passing the 75 µm sieve and more than 50% (by weight) passing the 2.36 mm sieve.

BAS COURSE

The base course in pavements is a layer of material in an asphalt roadway, race track, riding arena, or sporting field. It is located under the surface layer consisting of the wearing course and sometimes an extra binder course. If there is a sub-base course, the base course is constructed directly above this layer. Otherwise, it is built directly on top of the sub grade.

Sieve Size	Class A Sub Base Percent	Class B Sub Base Passing
62.5 mm	100	-
50 mm	90-100	100
37.5 mm	-	70-100
25 mm	-	55-85
19 mm	-	50-85
12.5 mm	-	-
9.5 mm	-	40-70
4.75 mm	35-70	30-60
2 mm	-	20-50
420 µm	-	10-30
75 µm	0-15	5-15

Other Quality Tests

Quality Test	Class A Sub Base	Class B Sub Base
Liquid Limit (ASTM D4318)	-	25 max
Plasticity Index (ASTM D4318)	6 max	6 max
Loss by Abrasion % (ASTM C131 or ASTM C535)	50 max	50 max
Loss Using Soundness Test with Mg SO4 (ASTM C88)	18	18
Minimum CBR at 95% Compaction	25	25



MARL

containing primarily carbonate (CaCO₃) and clays of different percentages with occasional traces of organic matter, silt or sand is usually used as bases and sub-bases for roads and highways. Marl is usually used as sub-grade layers or as a backfill in base and sub-base layers for highway pavements.

SELECT FILL MATERIAL COMMON BACKFILLING MATERIAL

Where we always exceed our customers expectations in quality, delivery and cost through continuous improvement and customer interaction. Always customer first approach.

Select Fill (Class 1) Materials shall conform to the following requirements in addition to those specified for Common Fill (Class 2) material:

- The Plasticity Index shall be less than 6 and liquid limit less than 25, when tested in accordance with ASTM D4318.
- The CBR of the material shall be a minimum of 15% or as specified by the project
- The weight of soluble salts in soil shall be less than 3%
- When tested in accordance with ASTM D422, the material shall comply with the grading E requirements nominated in Table 4-1.

Sieve Analysis is as Follow

Sieve Size	Class A Graded Base Course (Percentage Passing)	Class B Graded Base Course (Percentage Passing)
62.5 mm	100	-
50 mm	90-100	-
37.5 mm	60-90	100
25 mm	42-77	60-100
19 mm	35-70	55-85
12.5 mm	26-60	-
9.5 mm	-	-
4.75 mm	15-40	35-60
2 mm	10-26	25-50
420 um	5-15	15-30
75 um	2-9	8-15

Course thickness ranges from 100 to 150 millimetres (4 and is governed by underlying layer properties. Generally consisting of a specific type of construction aggregate, it is placed by means of attentive spreading and compacting to a minimum of 95% relative compaction, thus providing the stable foundation needed to support either additional layers of aggregates or the placement of an asphalt concrete wearing course which is applied directly on top of the base course. to 6 in)

Other Quality Tests

Quality Test	Class A Base Course	Class B Base Course
Liquid Limit (ASTM D4318)	-	25 max
Plasticity Index (ASTM D4318)	6 max	6 max
Loss by Abrasion % (ASTM C131 or ASTM C535)	40 max	40 max
Loss Using Soundness Test with Mg SO ₄ (ASTM C88)	14 max	14 max
Minimum CBR at 100% Compaction	100	50



COMMON FILL

(Class 2) /Common Fill (Class 2) material shall be suitable excavated material free of deleterious substances such as expansive clay, rubbish, organic, perishable or un-compactable material, waste concrete, or other debris. It shall be suitably graded to ensure that when compacted it derives its stability from compaction of the fine material around the coarser particles. Rock material must be broken down and evenly distributed throughout the layer to prevent the formation of voids and produce a dense compact embankment. To meet this requirement, additional fine material may need to be obtained from other sources and blended through the fill. Unless otherwise specified in the project documentation, when tested in accordance with ASTM D422, the material shall be well graded with 100% less than 150 mm in the greatest dimension and a maximum of 15% passing the No. 200 sieve, except that the largest size shall not exceed 1/3 the layer thickness after compaction.

AGGREGATE

Aggregate shall be composed of inert, durable material, reasonably uniform in quality and free from soft or disintegrated particles. Aggregate sub-base, base course materials and aggregate surface materials shall conform to the following requirements:

All crushed aggregate when tested according to ASTM C136 and ASTM C117 to be well graded and conform to project specified gradation limits. All crushed aggregate when tested according to ASTM D5821 and AASHTO TP61-02, Fracture Count for Coarse Aggregate, Method 'A', shall meet the following minimum requirements:

- Heavily trafficked roads (as defined in the project documentation) - 75% of the material retained on the 4.75 mm sieve must have one or more fractured faces.
- Other roads - 60% of the material retained on the 4.75 mm sieve must have one or more fractured faces.
- The plasticity index for crushed aggregate shall not exceed 6.0.

SAND

Sand (Normal/ Sweet) is a key component of a properly backfilled hole or trench in that it provides drainage and compacts well, especially when its damp. Above the rock bedding is a layer of felt to prevent the sand from washing into the rock bed, sand and top soil. Properly layering these materials prevents sinking after the backfill. As per ASTM -D2487 ; 3.1.6 sand—particles of rock that will pass a No. 4 (4.75-mm) sieve and be retained on a No. 200 (75-gm) U.S. standard sieve with the following subdivisions:

Coarse—passes No. 4 (4.75-mm) sieve and retained on No. 10 (2.00-mm) sieve,
(Concrete works) Medium—passes No. 10 (2.00-mm) sieve and retained on No. 40 (425-gm) sieve,- (Masonry & Plastering works) and Fine—passes No. 40 (425-gm) sieve and retained on No. 200 (75-gm) sieve - (Plastering works) Clean Sand Soil meeting the following gradation and containing less than 3% weight of organic material or clay:

Sieve Size	Percentage Passing
¼" inch (6.25 mm)	100
No. 10 (2.00 mm)	90-100
No. 200 (0.075 mm)	10 or less

