Technician Forum Grading & Base

2021

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Grading, Base, Reclamation, & Aggregates

Outline

2021 Specification Changes,

Schedule of Materials Control, and

other Recent Changes

Test Rolling Schedule of Materials Control

SMC (2018):

- Base (2211),
- FDR (2215), and
- Dirty Granular

Minimum 12’ x 300’ length.


05/24/2005

New Small LWD about half the weight of older units

- No proctor test required for Density
- One point proctor for moisture.
- See Moduli in G&B manual.

LWD Minimum Elastic Moduli for Granular, Clay and Clay Loam, and Base		
Specification	**Material Type**	**Minimum Elastic Modulus [MPa]**
2106	Granular	40
	Clay and Clay Loam	20
2211	Base	50
2215	Reclamation	

2020 G&B Manual Sand Cone Sand

- MnDOT requires #20 - #30 Sand, whilst ASTM D1556 (1990) requires #10 - #60 Sand
- Cost is $7.50 per test for MnDOT required sand versus $2.50 for ASTM sand.
- G&B Manual now allows ASTM D1556 sand

Target Value for DCP

Procedure in Grading and Base Manual 2016

2018 MCS

- Engineer choose to divide lots sizes into smaller volumes/weights of non-equal sizes.

- Test at Engineer’s Discretion
  Bit content, clay content, concrete content, objectionable materials

Riprap
(Special Provision & Schedule of Materials Control)
Hydraulics/Bridge

Quality Requirements for Carbonate Sources: QC Requirements

Gradation Requirements: Supplier: (image analysis)

Agency D_{85} (diameter at 85% Passing)

Crushing Test Changes

- Changing to same as HMA, i.e., based upon % crush of +4
- Specs changed with test
  - Class 5: 10% → 25%
  - Class 6: 15% → 30%
- Test discretionary for Engineer

Sampling Criteria for Base 2021 Spec. Book

- Change from after spreading before compaction to before spreading
  - Inconsistent
  - Taking sample over dozer tracks
  - Too short a window to gather sample
  - Making changes to Grading and Base Manual

Table 2211-4 Monetary Price Adjustments for Base, Surfacing, etc. Removed from *2021* Spec Book

New guidelines will be put on the Grading & Base web page

Also consider using:

1512 **UNACCEPTABLE AND UNAUTHORIZED WORK**

1601 **SOURCE OF SUPPLY AND QUALITY**

1603.3 **MATERIALS: SPECIFICATIONS, SAMPLES, TESTS, AND ACCEPTANCE**

1603.4 **ACCEPTANCE**

Structural Backfill Specification
(This Picture is Super Sand 24 hours after rain)

- Met super sand & structural backfill: #40/10 (0-65) & #200/10 (0-10)
- > 24 hours after a rain
- Sample was: 8% Passing #200 % & 5% Clay
- Changed Structural Backfill to:

5% #200 & 1.5% Clay

3138 Surfacing Aggregate 2018 & 2021 Spec. Book

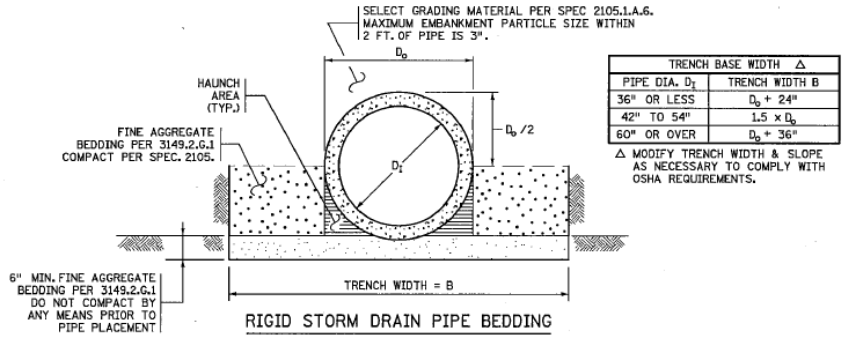
Minimum clay 3% and Plasticity Index of 5 - 12.

Requirements met for recycled or quarry stone

2106 & 2211

- **Contractor meets:**
  - Quality compaction,
  - Specified density,
  - LWD, and
  - DCP (Granular Only)

- **Agency Tests:**
  - Quality compaction and
    - Specified density, LWD, or DCP.



TRENCH BASE WIDTH △	
PIPE DIA. D_I	TRENCH WIDTH B
36" OR LESS	D_b + 24"
42" TO 54"	1.5 x D_b
60" OR OVER	D_b + 36"

△ MODIFY TRENCH WIDTH & SLOPE AS NECESSARY TO COMPLY WITH OSHA REQUIREMENTS.

RIGID STORM DRAIN PIPE BEDDING

CONSTRUCTION SEQUENCE

1. LOOSELY PLACE 6" OF FINE AGGREGATE BEDDING MATERIAL TO GRADE. DO NOT COMPACT PRIOR TO PIPE PLACEMENT.
2. FOR PIPES WITH BELL, REMOVE MATERIAL IN BELL AREA PRIOR TO PLACEMENT.
3. FINISH AND INSTALL PIPE TO GRADE.
4. AFTER INSTALLATION OF PIPE, PLACE ADDITIONAL FINE AGGREGATE BEDDING AND COMPACT THE FULL LENGTH ON BOTH SIDES OF THE PIPE UNDERNEATH THE HAUNCH AREA BY FIRST SHOVEL SLICING (MANUALLY SHOVE THE BLADE END OF SHOVEL AT AN ANGLE DOWN THE ENTIRE LENGTH OF HAUNCH UNDER PIPE) THEN COMPACT THE HAUNCH AT AN ANGLE USING A POWERED MECHANICAL OR PNEUMATIC DEVICE (I.E. POLE TAMPER, JUMPING JACK OR SIMILAR). COMPACT THE REMAINING MATERIAL OUTSIDE THE HAUNCH AREA TO THE REQUIREMENTS OF SPEC. 2105, ENSURING THAT THE ENTIRE LENGTH OF PIPE IS SUPPORTED UNIFORMLY BY BEDDING.
5. PLACE AND COMPACT BACKFILL EVENLY AND SIMULTANEOUSLY IN 6" LIFTS ON EACH SIDE OF THE PIPE UP TO THE MID-HEIGHT WHEN COMPACTED.
6. COMPLETE REMAINING BACKFILL.

NOTES

EXCAVATE & CONSTRUCT ALL TRENCHES AND SLOPES PER OSHA REQUIREMENTS.
PIPE SIZE IS BASED ON THE NOMINAL INSIDE DIAMETER.
PROTECT ALL PIPE DURING CONSTRUCTION PER SPEC. 2501 OR 2503.

Compaction under sidewalk and trails. 2020

- New testing rates for compacting (2020 SMC)

2108
2021 Spec. Book

- New Geotextile Spec.
- Type 5 not recommended.
- Use Type 7 as a min. for marginable soils.
- Poor soils: Type 9, 10, 11, or 12

(Call G&B for assistance)

Spec 2106: 2018 & 2021 Spec. Book

For slopes steeper than 1:4, Construct steps with min width of 12” and a max height of 24”, before placing embankment.

2215 Reclamation 2018 & 2021 Spec. Book

- No more lifts > 6”

Reminder Regarding Aggregates

As is currently, and as required in AASHTOware

Aggregate Sources need a pit #

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