

# **TENDER DOCUMENTS**

## **SUBSECTION 6.81 BASE AND SUB-BASE**

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## SUBSECTION 6.81 BASE AND SUB-BASE

### 6.81.1 GENERAL

6.81.1.1 This subsection describes the requirements relating to the base and sub-base work covered by this Contract.

6.81.1.2 Any specific requirements pertaining to the base and sub-base work covered by this Contract are set out on the drawings and in Section 4 *Special Technical Conditions*.

### 6.81.2 MEASUREMENT UNITS

6.81.2.1 The measurement units and respective symbols thereof used in this subsection are described as follows:

Measurement Unit	Designation	Symbol
length	meter	m
length	millimeter	mm
length	micrometer	$\mu\text{m}$
area	square meter	$\text{m}^2$
volume	cubic meter	$\text{m}^3$
mass	kilogram	kg
mass	ton	t

### 6.81.3 REFERENCE STANDARDS

6.81.3.1 The **Contractor** shall carry out all base and sub-base work in accordance with the requirements of the following standards and documents, to which the provisions of this Contract are added:

6.81.3.1.1 (ASTM) ASTM International:

- ASTM D6938 *Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)*.

6.81.3.1.2 Bureau de normalisation du Québec (BNQ):

- BNQ 2501-170 *Sols – Détermination de la teneur en eau*;
- BNQ 2501-255 *Sols – Détermination de la relation teneur en eau – masse volumique – Essai avec énergie de compactage modifiée (2700 kN•m/m<sup>3</sup>)*;
- BNQ 2560-114 *Travaux de génie civil – Granulats, « Partie I : Définitions, classification et désignation »*;

- BNQ 2560-114 *Travaux de génie civil – Granulats, « Partie II : Fondation, sous-fondation, couche de roulement et accotement »*;
- BNQ 2560-114 *Travaux de génie civil – Granulats, « Partie III : Coussin, enrobement, couche anticontaminante et couche filtrante »*;
- BNQ 2560-600 *Granulats – Matériaux recyclés fabriqués à partir de résidus de béton d'enrobés bitumineux et de briques – Classification et caractéristiques.*

#### 6.81.3.1.3 Ministère des Transports du Québec (MTQ):

- MTQ – *Cahier des charges et devis généraux (CCDG)*;
- MTQ – *Normes – Ouvrages routiers – Tome VII Matériaux:*
  - MTQ – *Norme 1101 – Classification des sols*;
  - MTQ – *Norme 13101 – Géotextiles.*
- *Laboratoire des chaussées du MTQ (LC):*
  - LC 21-010 *Échantillonnage*;
  - LC 21-040 *Analyse granulométrique*;
  - LC 21-070 *Détermination du pourcentage d'usure pour attrition du gros granulat au moyen de l'appareil Micro-Deval*;
  - LC 21-255 *Détermination de la valeur au bleu de méthylène des sols et des granulats*;
  - LC 21-400 *Détermination de la résistance à l'abrasion au moyen de l'appareil Los Angeles*;
  - LC 22-001 *Détermination de la masse volumique sèche maximale d'un matériau granulaire au moyen d'une planche de référence*;
  - LC 22-002 *Détermination du facteur de correction de la teneur en eau des sols et des matériaux granulaires mesurée à l'aide d'un nucléodensimètre*;
  - LC 22-003 *Détermination de la compacité des sols et des matériaux granulaires à l'aide d'un nucléodensimètre.*

## 6.81.4 MATERIALS

### 6.81.4.1 PAVEMENT SUB-BASE

- 6.81.4.1.1 The MG 112 type granular materials used in sub-base shall comply with standard BNQ 2560-114 *Partie II* following the implementation of the granular materials.

- 6.81.4.1.2 The materials used as anti-contaminant or filter layer shall comply with standard BNQ 2560-114 *Partie III* following the implementation of the granular materials.
- 6.81.4.1.3 The grading of MG 112 type granular materials shall comply with the percentage passing the 5 mm sieve to range between 20 and 75%.
- 6.81.4.1.4 This material may be replaced, based on availability, by MG 56, MG 80 or MG 20 type granular material, by an RM-1 to RM-4 type recycled material in accordance with standard BNQ-2560-600, or by a non-recycled material.
- 6.81.4.1.5 The sub-base material shall be crushed stone, crushed gravel or natural gravel.

6.81.4.2 PAVEMENT BASE

- 6.81.4.2.1 The MG 20 type granular materials used in base shall comply with standard BNQ 2560-114 *Partie II*, following the implementation of the granular materials.
- 6.81.4.2.2 The base shall be constructed according to the indications on the drawings, by means of crushed granular materials from a sandpit, a quarry or Class 1 excavated materials.
- 6.81.4.2.3 The MG 20 type granular materials used as base shall comply with standard BNQ 2560-114 *Partie II* following compaction. However, the grading in reserve is amended in part and shall comply with the following requirements:

Sieve	% Passing
31.5 mm	100
20 mm	90 – 100
14 mm	68 – 93
5 mm	35 – 55
1.25 mm	15 – 38
315 µm	5 – 17
80 µm	2.0 – 5.0

- 6.81.4.2.4 If the particle size requirements of the materials stockpiled, the weighted average of test results, are not met, the **Contractor** shall demonstrate, using a trial section, that the requirements of standard BNQ 2560-114 *Partie II* are met following implementation and compaction.
- 6.81.4.2.5 Once the trial section prepared and the materials densified according to the requirements of paragraph 6.81.5.2.4, the laboratory member of the *Association des firmes de génie-conseil - Québec* (AFG), retained by the **Contractor** shall perform three (3) random samplings and carry out the sieve analysis of each sample. The average of these sieve analysis results shall comply with standard BNQ 2560-114 *Partie II* following complete implementation of the base material.

- 6.81.4.2.6 If the particle size requirements of the materials in reserve, the weighted average of test results, are not met, the **Contractor** shall also submit to the Engineer, in writing, the details of the measures proposed to make these materials compliant and homogeneous. The **Contractor** shall then proceed with new samplings and tests for the sieve analyses of the materials in reserve to reach the requirements indicated in paragraph 6.81.6.2.3. The results shall appear on the certificate of conformity.
- 6.81.4.2.7 In the case of a transition layer on broken rock, the transition material shall be a MG 56 type granular material. The MG 56 type granular material may be replaced by a MG 20 type granular material if a Type III geotextile is placed between the broken rock and the granular material. The transition material shall meet the same requirements of quality assurance, implementation, delivery control following implementation and payment method than those defined for the base material. If a geotextile is used, it shall comply with MTQ standard 13101.
- 6.81.4.2.8 The materials used as anti-contaminant or filter layer shall comply with standard BNQ 2560-114 *Partie III* following implementation of the granular materials.

## 6.81.5 EXECUTION OF WORK

### 6.81.5.1 GENERAL

#### 6.81.5.1.1 Transportation of granular materials

- 6.81.5.1.1.1 Materials from quarries or sandpits shall be processed according to the requirements for the supply of quarry or sandpit materials and shall be transported so as to avoid the formation of ruts and depressions at the level of the infrastructure and of the various layers forming the roadway bases; depressions and ruts exceeding the permissible deviation at the infrastructure and at any other layer level shall be corrected, at the expense of the **Contractor**, before the next layer is placed.

### 6.81.5.2 PAVEMENT SUB-BASE

- 6.81.5.2.1 The sub-base materials shall be spread in layers of uniform thickness not exceeding 300 mm. The materials classified "SP" according to MTQ standard 1101 may however be spread in layers of uniform thickness not exceeding 600 mm.
- 6.81.5.2.2 The Contractor's Laboratory shall ensure that the compactness of each layer of sub-base materials is reached using a moisture density gauge according to method LC 22-003. The K correction factor used to correct the measured water content of each type of sub-base granular material shall be determined according to method LC 22-002. The moisture density gauge used shall be calibrated at least once a year in accordance with the procedure defined in standard ASTM D6938.

- 6.81.5.2.3 The sub-base materials consisting of granular materials from sandpits shall be densified to a minimum of 90% of the maximum dry density according to the BNQ 2501-255 test method, with the exception of the last one hundred and fifty (150) millimeters below the sub-base line, which shall be densified to a minimum of 95%.
- 6.81.5.2.4 The sub-base materials consisting of crushed granular materials from a quarry or from Class 1 excavated materials shall be densified to the maximum dry density determined using a trial section meeting the requirements indicated in article 6.81.5.4 *Preparation of a Trial Section*.
- 6.81.5.2.5 In the cases where the BNQ 2501-255 test cannot be conducted on the sub-base material from a sandpit due to too high a percentage of particles larger than 20 mm, a trial section shall be prepared following method LC 22-001. The minimum water content of the materials to be compacted shall be established on the basis of the table below:

Material	Minimum Water Content before Compaction <sup>1</sup>
MG 56	4.0%
MG 80	3.0%
MG 112 (passing 5 mm < 50%)	5.0%
MG 112 (passing 5 mm ≥ 50%)	7.0%

1. The water content is adjusted according to the grading of the sub-base material and shall be measured according to test method BNQ 2501-170.

- 6.81.5.2.6 Before placing the bases, the sub-base surface shall be free of ruts and other depressions, and any deviation of more than 20 mm relative to the required level shall be corrected. In addition, the **Contractor** shall provide for a minimum cross slope on the platform for the drainage of the water towards the side ditches.
- 6.81.5.2.7 The **Contractor** shall take all necessary precautions to ensure that the materials remain compliant to standard BNQ 2560-114 during implementation and compaction works, until acceptance of the sub-base work.
- 6.81.5.3 PAVEMENT BASE
- 6.81.5.3.1 Stockpiling of base materials
- 6.81.5.3.1.1 Base materials shall be stockpiled after crushing in order to be controlled. All work necessary to correct them shall be carried out in stockpiles.

- 6.81.5.3.1.2 The stockpiles shall be located on sites that have been leveled, drained and cleaned of all contaminants. In each layer, the materials shall be deposited stockpile against stockpile whose height shall not exceed 2 m. These stockpiles shall be leveled to form a layer not exceeding 1.20 m in height. The layer can subsequently be brought, using a loader, up to 3 m high, unlevelled. The periphery of each layer shall be located at 1 m within the periphery of the underlying layer.
- 6.81.5.3.1.3 Any layer that does not meet the particle size requirements shall be corrected before placement of the next layer.
- 6.81.5.3.1.4 When the stockpiling of base materials is carried out using a mobile telescopic radial stockpile stacking conveyor, the height of each level shall not exceed 1.2 m, and this new level shall be located within the underlying level.
- 6.81.5.3.1.5 The materials from different stockpiles shall be deposited so as to avoid the mixing of stockpiles.
- 6.81.5.3.2 Implementation of base materials
- 6.81.5.3.2.1 The **Contractor** is responsible for supplying materials in accordance with standard BNQ 2560-114 after complete placement thereof on worksite. The **Contractor** shall, therefore, maintain, at its expense, an appropriate internal control system. The **Contractor** shall take into account, in its implementation work, the potential degradation of materials due to construction equipment and vehicular traffic.
- 6.81.5.3.2.2 Base materials shall be spread in uniform layers of a maximum thickness of 300 mm. As the discharge of materials progresses, the surface shall be leveled, moistened or dried, if necessary, in order to obtain the optimum water content obtained in accordance with standard BNQ 2501-255. The layer of materials shall then be densified.
- 6.81.5.3.2.3 The compaction shall be performed according to the requirements for the worksite compactness specified in paragraphs 6.81.5.3.2.6 or 6.81.5.3.2.7. After compaction, any deviation of the longitudinal and transverse profiles for the base that exceeds 10 mm shall be corrected.
- 6.81.5.3.2.4 The Engineer check the compactness of each layer of base materials using a moisture density gauge in accordance with method LC 22-003. The moisture density gauge used shall be calibrated at least once a year in accordance with the procedure defined in standard ASTM D6938.
- 6.81.5.3.2.5 In the case where the manufacturing and placement of asphalt are part of this Contract, the **Contractor** shall consider that implementation of the base and the preparation of the granular surface prior to paving are two (2) separate works.
- 6.81.5.3.2.6 The base materials consisting of crushed granular materials from a sandpit or gravel pit shall be densified to a minimum of 98% of the maximum dry density according to the BNQ 2501-255 test method.



- 6.81.5.3.2.7 The base materials consisting of crushed granular materials from a quarry or from Class 1 excavated materials shall be densified to the maximum dry density determined using a trial section that meets the requirements indicated in paragraph 6.81.5.3.3 and in Article 6.81.5.4 *Preparation of a Trial Section*.
- 6.81.5.3.3 Determination of the maximum dry density of base materials consisting of crushed granular materials from a quarry or from Class 1 excavated materials.
- 6.81.5.3.3.1 The density of base materials consisting of crushed granular materials from a quarry or from Class 1 excavated materials shall be determined by means of a trial section prepared according to the requirements for the preparation of a trial section and which shall meet the following requirements:
- 6.81.5.3.3.1.1 the trial section shall be prepared from materials from a stockpile for which a certificate of conformity has been issued in accordance with the requirements for base materials in stockpile;
- 6.81.5.3.3.1.2 the trial section shall be prepared before placement of each 20,000 t of MG 20 base materials and at each change in the source of supply. For a final placement less than 20,000 t, a trial section shall be prepared if required by the Engineer.
- 6.81.5.3.3.2 The trial section shall be used to determine the number of passages required to obtain the optimum level of compactness required on worksite and to avoid over-compaction. To this effect, the term “passage” of compaction equipment is defined as one passage of the compacting equipment; not a round trip.
- 6.81.5.3.3.3 The maximum density of a base material consisting of crushed granular materials from a quarry or from Class 1 excavated materials shall be determined on the dry density curve, measured with the moisture density gauge, based on the number of passages, when two (2) consecutive readings give an increase in the density of less than 1%.
- 6.81.5.3.3.4 The Engineer may require retaking the determination of the maximum density in the following cases:
- 6.81.5.3.3.4.1 the compaction equipment used for the placement of materials on worksite does not deploy compaction energy equivalent to that produced by the compacting equipment used for the preparation of the trial section;
- 6.81.5.3.3.4.2 the density obtained on worksite after the set number of passages is no longer that determined by the trial section;
- 6.81.5.3.3.4.3 the nature of the infrastructure soil on which the trial section is prepared is not representative of that of the worksite.
- 6.81.5.4 PREPARATION OF A TRIAL SECTION
- 6.81.5.4.1 The **Contractor** shall inform the Engineer of the location where it intends to prepare the trial section at least four (4) working days prior to preparing it.

- 6.81.5.4.2 The nature of the infrastructure soil on which the trial section is prepared shall be representative of that of the worksite.
- 6.81.5.4.3 The trial section shall be 35 m long and have a minimum width of 5 m. The thickness of the base layer to be prepared shall be as indicated on the drawings.
- 6.81.5.4.4 To prepare the trial section, the **Contractor** shall source materials in different locations of the stockpile, so as to use materials which are representative of the production.
- 6.81.5.4.5 The materials shall be spread in uniform layers of a maximum thickness of 300 mm. As the discharge of materials progresses, the surface shall be leveled and the materials shall be moistened or dried in order to obtain the optimum water content. The water content in the materials is determined in accordance with the BNQ 2501-170 standard.
- 6.81.5.4.6 The materials shall be densified with a dynamic compaction equipment that deploys compaction energy similar to that produced by the equipment that is used for the implementation of the materials on worksite.

## 6.81.6 QUALITY CONTROL

### 6.81.6.1 PAVEMENT SUB-BASE

- 6.81.6.1.1 The quality of the raw materials at source or from Class 1 excavated materials remains the responsibility of the **Contractor**.
- 6.81.6.1.2 Certificate of conformity
  - 6.81.6.1.2.1 The **Contractor** shall, at least fourteen (14) days prior to the commencement of works, provide the Engineer with a certificate of conformity. In the case of a stockpile, if the materials are processed (crushing, washing, addition, sieving), the certificate of conformity shall focus on the processed materials.
  - 6.81.6.1.2.2 A new certificate of conformity shall be produced when any change occurs in the area or level of operations, in the operating site or at each new stockpile. The intrinsic and complementary properties of raw materials shall comply with standard BNQ 2560-114 *Partie II* or *Partie III*, as applicable.
  - 6.81.6.1.2.3 The certificate of conformity shall include the following information:
    - 6.81.6.1.2.3.1 the name of the laboratory member of AFG, or of the manufacturer's ISO 9001 "*Fabrication de matériaux granulaires*" certified laboratory that performed the sampling according to test method LC 21-010 and conducted the tests;
    - 6.81.6.1.2.3.2 the full results of the sieve analyses of the granular material carried out according to the rate specified in article 6.81.6.1.5;
    - 6.81.6.1.2.3.3 the results of the intrinsic and complementary properties tests according to the rate specified in article 6.81.6.1.6;

- 6.81.6.1.2.3.4 if there is processing of materials, the **Contractor** shall specify the proportion of added materials as well as the processing method used;
- 6.81.6.1.2.3.5 a sketch showing the location of the area of operations or of the stockpile as well as the location of each sample and, where applicable, explaining the operating mode to make these materials compliant and homogeneous.
- 6.81.6.1.2.4 When the **Contractor** elects to source materials from a commercial source that has been operating for several years, the Engineer may authorize, in lieu of the tests specifically requested in paragraph 6.81.6.1.2.3, a compilation of previous test results conducted by a laboratory member of AFG. These results shall correspond to the last production period of the source and represent a quantity of materials at least equivalent to that required in this Contract.
- 6.81.6.1.3 If the results of the tests conducted on the raw materials reveal that they do not meet the requirements of BNQ 2560-114 *Partie II* or *Partie III* standard, as applicable, the **Contractor** shall change the operating site or specify in writing to the Engineer the measures it intends take to improve the materials in order to make them comply with the standard.
- 6.81.6.1.4 The Engineer authorize the transportation of the sub-base materials only upon reception of the certificate of conformity presenting all the information described above.
- 6.81.6.1.5 Sieve analyses
- 6.81.6.1.5.1 The sieve size analysis shall be carried out according to test method LC 21-040, from a sampling compliant with article 6.2 of test method LC 21-010. The sampling and testing shall be done according to the minimum rate of one (1) test per 5,000 t of granular material, with a minimum of three (3) tests for each type of sub-base material.
- 6.81.6.1.6 Intrinsic and complementary properties
- 6.81.6.1.6.1 The intrinsic and complementary properties of the sub-base materials shall be determined according to the following test methods and rates:
- 6.81.6.1.6.1.1 the wear attrition test determined using the Micro-Deval apparatus according to test method LC 21-070, when more than 15% of the material is retained on the 5 mm sieve. This test shall be conducted at a rate of one (1) test per 40,000 t of granular material, with a minimum of two (2) tests for each type of sub-base material;
- 6.81.6.1.6.1.2 the methylene blue test according to test method LC 21-255, at a rate of one (1) test per 5,000 t of granular material, with a minimum of three (3) tests for each type of sub- base material;
- 6.81.6.1.6.1.3 the other tests to determine the other properties set forth in standard BNQ 2560-114 *Partie II* for sub-base granular materials, with a minimum of one (1) test for each type of material.

6.81.6.2 PAVEMENT BASE

6.81.6.2.1 The **Contractor** shall ensure the quality of the raw materials in the sandpit or quarry.

6.81.6.2.2 Certificate of conformity

6.81.6.2.2.1 The **Contractor** shall submit to the Engineer a certificate of conformity for each stockpile of crushed granular material, at least fourteen (14) days prior to using the material. The certificate certifies that the base materials in stockpile comply with the drawings. Control testing of the intrinsic, manufacturing and complementary properties shall be conducted by a laboratory member of AFG or by a manufacturer holding a registration certificate compliant with standard ISO 9001, whose scope covers the manufacturing of granular materials. The full results of the sieve analysis of the base materials in stockpiles shall be conducted by a laboratory member of AFG. Any production of materials subsequent to the issuance of the certificate of conformity shall be the subject of another reserve and of a new certificate of conformity.

6.81.6.2.2.2 The minimum stockpile shall consist of 2,500 m<sup>3</sup> or be equal to the total production of that granular material, if it is less than this volume. A quantity of 500 m<sup>3</sup> may be added to the last stockpile of the present Contract at no additional cost to the **Owner**.

6.81.6.2.2.3 The certificate of conformity shall include the following information, without however being limited thereto:

6.81.6.2.2.3.1 the name of the laboratory member of AFG or of the manufacturer's ISO 9001 "*Fabrication de matériaux granulaires*" certified laboratory that performed the sampling according to test method LC 21-010 and conducted the tests;

6.81.6.2.2.3.2 full results of the sieve analyses of the granular materials in stockpile, carried out according to the specified rate described in article 6.81.6.2.3 *Sieve analyses of the materials in stockpile*;

6.81.6.2.2.3.3 results of the intrinsic, manufacturing and complementary properties control tests, according to the specified rate described in article 6.81.6.2.4 *Intrinsic and manufacturing properties and complementary properties*;

6.81.6.2.2.3.4 if there is processing of materials, the **Contractor** shall specify the proportion of added materials as well as the processing method used;

6.81.6.2.2.3.5 a sketch showing the location of the area of operations or of the stockpile as well as the location of each sample and, where appropriate, explaining the operating mode to make these materials compliant and homogeneous.

6.81.6.2.2.4 The Engineer authorize the transportation of the base materials only upon reception of the certificate of conformity presenting all the items described above.

- 6.81.6.2.3 Sieve analyses of the materials in stockpile
- 6.81.6.2.3.1 The granular materials used for the base shall be crushed specifically for this Contract or come from a stockpile controlled according to the same criteria. The **Contractor** shall conduct, at its expense, a sieve testing program according to test method LC 21-040, from a sampling performed according to test method LC 21-010. The sampling and testing shall be performed according to the following minimum rate:
- 6.81.6.2.3.1.1 two (2) initial tests;
- 6.81.6.2.3.1.2 one (1) test per shift per production day, if the daily production is less than 2,500 m<sup>3</sup>;
- 6.81.6.2.3.1.3 one (1) additional test per shift for every 2,500 m<sup>3</sup>, if the daily production is greater than 2,500 m<sup>3</sup>.
- 6.81.6.2.4 Intrinsic and manufacturing properties and complementary properties
- 6.81.6.2.4.1 The intrinsic and manufacturing properties and the complementary properties of the base materials shall be determined according to the following test methods and rates:
- 6.81.6.2.4.1.1 the wear attrition test determined using the Micro-Deval apparatus according to test method LC 21-070, conducted at a rate of one (1) test per of 5,000 m<sup>3</sup> of base materials, with a minimum of two (2) tests for each type of material;
- 6.81.6.2.4.1.2 the methylene blue test determined according to test method LC 21-255, at a rate of one (1) test per 2,500 m<sup>3</sup> of base materials, with a minimum of three (3) tests for each type of material;
- 6.81.6.2.4.1.3 the other tests to determine the properties set forth in standard BNQ 2560-114 *Partie II*: at a minimum rate of one (1) test per test type and per base material.
- 6.81.6.2.4.2 In order to meet the requirements of the wear attrition test, all the results of a same stockpile of granular material shall be lower than the values indicated in standard BNQ 2560-114 *Partie I, tableau 2* for the concerned category.
- 6.81.6.2.4.3 In order to meet the requirements of the methylene blue test, all the results of a same stockpile of granular material from a gravel pit shall be lower than the value indicated in standard BNQ 2560-114 *Partie II, tableau 4*.
- 6.81.6.2.5 Base materials for the preparation of a trial section
- 6.81.6.2.5.1 The **Contractor** shall demonstrate that the requirements after implementation and compaction are met; it shall attach to the certificate of conformity described above the results of the sieve analyses of the materials of the trial section(s) prepared according to Article 6.81.5.4 *Preparation of a Trial Section*.

6.81.6.3 DELIVERY CONTROL AFTER IMPLEMENTATION

6.81.6.3.1 The delivery control is performed by the Engineer after complete implementation of each batch of sub-base and base materials.

6.81.6.3.2 The **Contractor** shall, in the presence of the Engineer, have control samples collected by a laboratory member of AFG, consisting of six (6) samples for one batch, seal them and use them when exercising the right of appeal provided for in article 6.81.6.4 *Contractor's Appeal*.

6.81.6.3.3 Unless otherwise indicated on the drawings, the conformity of the base material grading shall be based on the batch-by-batch assessment. Each batch represents a surface area of approximately 7,500 m<sup>2</sup> per compacted layer and each batch always consists of three (3) samples randomly localized and representing three (3) equal sections. The samples shall be collected in accordance with test method LC 21-010. At the end of the works of this Contract, all surface areas less than 1,500 m<sup>2</sup> are incorporated into the previous batch. Batch limits are determined by the Engineer before commencement of the work, and this information is communicated to the **Contractor**.

6.81.6.3.4 A minimum of one batch consisting of three (3) samples shall be formed if the surface area is less than 7,500 m<sup>2</sup>.

6.81.6.3.5 Pavement sub-base

6.81.6.3.5.1 Acceptance of a batch

6.81.6.3.5.1.1 A batch is deemed compliant when:

6.81.6.3.5.1.1.1 the average of the three (3) sieve analysis results meets the requirements of *tableau 1* of *Partie II* or *tableau 1* of *Partie III* of standard BNQ 2560-114, as applicable;

6.81.6.3.5.1.1.2 the requirement for the 80 µm sieve variability deviation is met;

6.81.6.3.5.1.1.3 there is no rejection of an individual sample;

6.81.6.3.5.1.1.4 the measured compactness meets the implementation requirements indicated on the drawings.

6.81.6.3.5.2 Rejection of a batch

6.81.6.3.5.2.1 A batch shall be rejected by the Engineer on the basis of the sieve results when the difference between the average of the three (3) sieve results and the values specified in standard BNQ 2560-114 *Partie II* exceeds at least one of the critical deviations (Cd) defined below:

6.81.6.3.5.2.1.1 Cd = - 5.0% (for the specification for the 112 mm sieve);

6.81.6.3.5.2.1.2 Cd = +1.0% (for the higher specification for the 80 µm sieve).

- 6.81.6.3.5.2.2 In such a case, the **Contractor** shall remove and replace, at its expense, the granular material contained in the rejected batch.
- 6.81.6.3.5.3 Rejection of an individual sample
- 6.81.6.3.5.3.1 When the percentage passing the 80 µm sieve of an individual sample of a batch is equal to or greater than 12.0%, the section represented by this sample shall be rejected by the Engineer. The **Contractor** shall, in this case, completely remove the materials of this section or use the appeal procedure provided in Article 6.81.6.4 *Contractor's Appeal* of this subsection. In that case, the **Contractor** shall have two (2) new samples collected in that section, on which sieve analysis tests shall be conducted. If the average of the two (2) samples is less than 12.0% passing the 80 µm sieve, the average of these two (2) results shall be used to replace the value of the sample rejected in the batch. If the average of the two (2) samples is still greater than or equal to 12.0% passing the 80 µm sieve, the **Contractor** shall completely replace the material in that section. A new sample shall then be collected and analyzed to constitute the batch.
- 6.81.6.3.6 Pavement base
- 6.81.6.3.6.1 Acceptance of a batch
- 6.81.6.3.6.1.1 A batch is deemed compliant when:
- 6.81.6.3.6.1.1.1 the average of the three (3) sieve analysis results fully meets the requirements for the 5 mm and 80 µm sieves;
- 6.81.6.3.6.1.1.2 the measured compactness meets the implementation requirements.
- 6.81.6.3.6.2 Rejection of a batch
- 6.81.6.3.6.2.1 A batch shall be rejected by the Engineer when the difference between the average of the three (3) sieve analysis results and the specified values exceeds at least one of the critical deviations (Cd) defined below:
- 6.81.6.3.6.2.1.1 Cd = - 5.0% (for the lower specification of the 5 mm sieve);
- 6.81.6.3.6.2.1.2 Cd = +5.0% (for the higher specification of the 5 mm sieve);
- 6.81.6.3.6.2.1.3 Cd = +1.0% (for the higher specification of the 80 µm sieve).
- 6.81.6.3.6.2.2 In such a case, the **Contractor** shall remove and replace, at its expense, the granular materials contained in the rejected batch.

#### 6.81.6.4 CONTRACTOR'S APPEAL

- 6.81.6.4.1 When a batch does not meet the requirements for acceptance of a batch and the **Contractor** wishes to exercise its right of appeal, the **Contractor** shall use the control samples that have already been collected. If such samples have not been collected, the **Contractor** shall hire a laboratory member of AFG to randomly resample and seal the samples in the presence of the Engineer. The resampling and conduct of the sieve analysis testing shall be performed during working hours and days. The costs for additional sampling shall be borne by the **Contractor**.
- 6.81.6.4.2 The determination of the sampling location, the sampling and the tests shall be performed in the presence of the Engineer. Any comments on methods deemed incorrect shall be signalled immediately, and the **Contractor** shall bring any dissenting opinion to the attention of the Engineer in writing.
- 6.81.6.4.3 The total number of new batch samples is six (6). They are used for the final calculation of the batch average. The conformity is reassessed by the Engineer. The new results entirely supersede the initial results; they thus become official and the appeal procedure ends.
- 6.81.6.4.4 The cost of sieve analysis testing shall be borne by the **Contractor** when the average value calculated from the new batch results does not fully meet the requirements. If, on the contrary, the new results are compliant, the cost of sieve analysis testing shall be borne by the **Owner**.
- 6.81.6.4.5 The **Contractor** shall submit its new results within seven (7) days following the collecting of the samples. Failing to do so, the **Owner** considers that the **Contractor** waives its right of appeal. A copy of the test results in the form of manuscripts recorded by the **Contractor** shall be delivered to the Engineer immediately after completion of testing.
- 6.81.6.4.6 Pavement sub-base
- 6.81.6.4.6.1 The **Contractor** that applies a dust suppressant other than water before reception of the sieve analysis results of the sub-base materials waives its right of appeal, unless the samples referred to in the present article are collected before the application of this dust suppressant, according to the procedure defined in the present article 6.81.6.4 *Contractor's Appeal*.
- 6.81.6.4.6.2 The **Contractor** that covers the granular material of a batch with a material intended for another use before reception of the sieve analysis results of the batch in question waives its right of appeal, unless the samples referred to in the present article are collected and sealed before the granular material of the batch in question is covered according to the procedure defined in this article 6.81.6.4.
- 6.81.6.4.7 *Contractor's Appeal base*
- 6.81.6.4.7.1 The **Contractor** that places asphalt or any other material before reception of the sieve analysis results of the base waives its right of appeal, unless the samples have been collected before the covering, according to the procedure defined in this article 6.81.6.4 *Contractor's Appeal*.

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**END OF SUBSECTION**