

**SECTION 704**  
**BASE AGGREGATES**

SCOPE

**704.01.01 MATERIALS COVERED**

- A. This specification covers the quality and size of mineral materials used in base courses, trench backfill, or other construction locations.
- B. The term Source shall mean any of the following:
  - 1. A permanent commercial location.
  - 2. Contractor manufactured material either commercial or on-site.

**704.01.02 REFERENCE CODES AND STANDARDS:**

- A. Related Interagency Quality Assurance Committee (IQAC) procedures at:  
[https://www.clarkcountynv.gov/government/departments/public\\_works\\_department/professional\\_services/iqac.php](https://www.clarkcountynv.gov/government/departments/public_works_department/professional_services/iqac.php)  
(IQAC website)

REQUIREMENTS

**704.02.01 GENERAL**

- A. The mineral aggregate shall be the crushed and screened product from approved aggregate deposits, except that Type I aggregate base need not be crushed. The Engineer reserves the right to prohibit the use of aggregates from any source when:
  - 1. The character of the material is such, in the opinion of the Engineer, as to make improbable the furnishing of aggregates conforming to the requirements of these specifications.
  - 2. The character of the material is such, in the opinion of the Engineer, that undue additional costs may be accrued by the Contracting Agency.
- B. The mineral aggregate shall be clean, hard, durable, free from any frozen lumps, deleterious matter, and harmful adherent coatings. Crushed Portland cement concrete and asphaltic concrete pavement will be permitted, subject to the requirements of these specifications. No materials subject to regulation as hazardous wastes as defined in the Nevada Administrative Code 444.8565 shall be allowed.
- C. The mineral aggregate used in the production of aggregate base shall be from a known in situ aggregate deposit located at the production location or at a designated source site.

**704.02.02 IQAC SOURCE QUALIFICATION**

- A. For expediting of material source and type approvals, a listing of qualified materials has been provided on the IQAC website.
- B. Any listed material is considered qualified for use without a material testing submittal. However, this does not relieve the Contractor of project testing of the material as required in these specifications.

- C. The IQAC posted materials indicated in Table 1 are subject to reapproval annually or as specified in table 1 for continued posting on the IQAC website. The procedure is annotated in **Subsection [704.04.02](#), "IQAC Annual Material Prequalification."**

**Table 1 – IQAC Materials Qualification Periods**

Type II Aggregate Base	1 Year
Type II Controlled Low Strength Material (CLSM)	1 Year
Type II w/ 30% Recycled Asphalt	6 Months
Type II w/ 50% Recycled Concrete	6 Months
Type II w/ 100% Recycled Materials*	3 Months

\*This includes materials made with imported native materials

### 704.02.03 DEFICIENCIES

- A. If the product of a deposit is deficient in material passing the No. 16 sieve, filler from other approved deposits may be added at the crushing and screening plants. This is not to be construed as a waiver of any of the requirements contained herein.

## PHYSICAL PROPERTIES AND TESTS

### 704.03.01 PLASTIC LIMITS

- A. When specified, aggregates shall conform to the applicable requirements of the following table:

**Table 3 – Plastic Limits**

Percentage by Weight Passing 200 Sieve	Plasticity Index Maximum
0.1 to 3.0	15
3.1 to 4.0	12
4.1 to 5.0	9
5.1 to 8.0	6
8.1 to 11.0	4
11.1 to 15.0	3

### 704.03.02 DRAIN BACKFILL

- A. This aggregate shall conform to the following requirements:

**Table 4 – Drain Rock Gradation Acceptance Limits**

Sieve Sizes	Percentage by Dry Weight Passing Sieve		
	3-Inch Size	2-Inch Size	3/4-Inch Size
3-Inch	100	--	--
2-Inch	90-100	100	--
1-1/2-Inch	70-100	95-100	--
3/4-Inch	0-50	50-100	100
1/2-Inch	--	--	95-100
3/8-Inch	0-10	0-55	70-100
No. 4	--	0-25	0-70
No. 8	0-5	0-15	--
No. 200	0-3	0-3	0-3

- B. Unless otherwise specified in the contract documents, the Contractor may use any of the sizes.

**Table 5 – Drain Backfill Durability Acceptance Limits**

Source Requirement Test	3-Inch Size	2-Inch Size	3/4-Inch Size
Percentage of Wear (500 Rev.)	45% Maximum	45% Maximum	45% Maximum

#### 704.03.03 TYPE I AGGREGATE BASE

- A. This aggregate shall conform to the following requirements:

**Table 6 – Type I Gradation Acceptance Limits**

Sieve Sizes	Percentage by Dry Weight Passing Sieve	
	3-Inch Size	2-Inch Size
3-Inch	100	--
2-Inch	90-100	100
1-1/2-Inch	--	95-100
1-Inch	--	70-90
No. 4	30-65	30-65
No. 16	15-40	15-40
No. 200	2-12	2-12

**Table 7 – Type I Acceptance Limits**

Project Control Test	Test Method	Requirements
Sieve Analysis	AASHTO T27	Table 6
Sampling Aggregate from Calibrated Conveyor stream or belt cut <sup>1</sup>	AASHTO T2	--
Plasticity Index	AASHTO T90 <sup>2</sup>	Table 3
Liquid Limit	AASHTO T89	35 Maximum
Resistance (R Value)	ASTM D2844	60 Minimum
Percentage of Wear (500 Rev.)	AASHTO T96	45% Maximum

#### 704.03.04 TYPE II AGGREGATE BASE

- A. This aggregate shall conform to the following requirements:

**Table 8 – Type II Gradation Acceptance Limits**

Sieve Sizes	Percentage by Dry Weight Passing Sieve
1-Inch	100
3/4-Inch	90-100
No. 4	35-65
No. 16	15-40
No. 200	2-10

<sup>1</sup> Sampling from a stockpile permitted only after approval of the Engineer; the conveyor device shall be calibrated every 3 months and record attached to sample document.

<sup>2</sup> Test specimens shall be prepared following the dry preparation procedure AASHTO T87.

**Table 9 – Type II Acceptance Limits**

Quality Control Test	Test Method	Requirements
Sieve Analysis	AASHTO T27	Table 8
Sampling Aggregate from Calibrated Conveyor stream or belt cut <sup>3</sup>	AASHTO T2	--
Fractured Faces	Nev. T230	70% Minimum
Plasticity Index	AASHTO T90 <sup>4</sup>	Table 3
Liquid Limit	AASHTO T89	35 Maximum
Resistance (R Value) or Resilient Modulus	ASTM D2844 AASHTO T307	78 Minimum for road base 35,000 psi minimum for road base
Percentage of Wear (500 Rev.)	AASHTO T96	45% Maximum
Total Available Water-Soluble Sulfates <sup>5</sup>	ASTM D2791 AWWA 4550 E	Less than 0.3% by dry weight of soil.

- B. Type II Plantmix Aggregate as specified in **Subsection 705.03.01, "Plantmix and Roadmix Bituminous Base and Surface Aggregate, Types Two Fine and Coarse and Three,"** may be used in lieu of Type II Base Aggregate as specified above.

#### 704.03.05 TYPE III AGGREGATE

- A. The soluble sulfate content shall not exceed 0.3 percent by dry weight of soil. The mineral shall be clean, hard, durable, free from any frozen lumps, deleterious matter, and harmful coatings. In addition thereto, the material shall conform to the gradation requirements of Type II aggregate base in accordance with **Subsection 704.03.04, "Type II Aggregate Base,"** with the following property testing:

**Table 10 – Type III Acceptance Limits**

Quality Control Test	Test Method	Requirements
Sieve Analysis	AASHTO T27	Table 8
Sampling Aggregate from Calibrated Conveyor stream of belt cut <sup>6</sup>	AASHTO T2	--
Plasticity Index	AASHTO T 90 <sup>7</sup>	Table 3
Liquid Limit	AASHTO T 89	35 Maximum
No. 200 Sieve	AASHTO T 27	2-15%
Total Available Water Soluble Sulfates <sup>8</sup>	AWWA 3500-NaD AWWA 4550 E	Less than 0.3% by dry weight of soil

#### 704.03.06 CRUSHED ROCK

- A. Crushed rock shall be the product from approved aggregate deposits and shall only be used as directed by the Contracting Agency. The mineral aggregate shall be clean, hard,

<sup>3</sup> Sampling from a stockpile permitted only after approval of the Engineer; the conveyor device shall be calibrated every 3 months and record attached to sample document.

<sup>4</sup> Test specimens shall be prepared following the dry preparation procedure AASHTO T87.

<sup>5</sup> Required only for placement around waterline pipe.

<sup>6</sup> Sampling from a stockpile permitted only after approval of the Engineer.

<sup>7</sup> Test specimens shall be prepared following the dry preparation procedure AASHTO T87.

<sup>8</sup> Required only for placement around waterline pipe.

durable, free from any frozen lumps, deleterious matter, and harmful coatings. In addition thereto, the material shall conform to the following gradation requirements:

**Table 11 – Crushed Rock Gradation Acceptance Limits**

Sieve Sizes	Percentage of Weight Passing
3/8-Inch	100
No. 4	20-80
No. 200	0-15

**Table 12 – Crushed Rock Acceptance Limits**

Quality Control Test	Test Method	Requirements
Sieve Analysis	AASHTO T 27	Table 11
Sampling Aggregate From Calibrated Conveyor stream of belt cut <sup>9</sup>	AASHTO T 2	-----
Fractured Faces	Nev. T 230	90% Minimum
Plasticity Index	AASHTO T 90 <sup>10</sup>	Table 3
Liquid Limit	AASHTO T 89	35 Maximum
Percentage of Wear (500 Rev.)	AASHTO T 96	45% Maximum
Total Available Water Soluble Sulfates <sup>11</sup>	AWWA 3500-NaD AWWA 4550 E	Less than 0.3% by dry weight of soil

#### 704.03.07 CONTROLLED LOW STRENGTH MATERIAL (CLSM)

- A. CLSM shall consist of a low-strength, self-leveling concrete material composed of various combinations of cement, supplementary cementitious material (SCM), water, chemical admixtures, and aggregate. The aggregate shall be comprised of either of the following: fine aggregate, fine aggregate plus coarse aggregate, or a graded aggregate having coarse through fine sieve sizes. Crushed concrete, non-spec aggregate, or ASTM C33 materials are acceptable. Coarse aggregate only is not acceptable. CLSM shall have a design compressive strength at an age of 28 days within the ranges required below for the specified class:
1. Class I - (50 to 150 psi): Specified where the maximum strength is of primary concern due to the desire to have material that can be excavated in the future with relative ease.
  2. Class II – (100 to 300 psi): Specified where the minimum strength is of primary concern for pipe support.
  3. Class Special (as shown in project specifications or drawings): Specified where project unique criteria, such as erosion control, are the primary concern.
  4. Class I and Class II CLSM:
    - a. The mix shall result in a product having a slump in the range of 6 to 10 inches at the time of placement in the pipe zone. Above the pipe zone, a lesser slump is acceptable.

<sup>9</sup> Sampling from a stockpile permitted only after approval of the Engineer; the conveyor device shall be calibrated every 3 months and record attached to sample document.

<sup>10</sup> Test specimens shall be prepared following the dry preparation procedure AASHTO T87.

<sup>11</sup> Required only for placement around waterline pipe.

- b. The Contractor shall submit a mix design for approval by the Engineer prior to placement.
  - c. The mix design shall be supported by laboratory test data verifying the potential of the mix to comply with the requirements for these specifications.
5. Class III – Bonded Aggregate Fill (BAF) (50 to 150 psi): Specified where the maximum strength is of primary concern due to the desire to have material that can be excavated in the future with relative ease, and where reduced concrete cure time is desired.
- B. CLSM Class I and Class II shall be proportioned in general compliance with the methods outlined in ACI 211.1-91, "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete." The product shall be proportioned and mixed in a central plant or mobile mixer. The following materials shall be used:
1. Cement shall meet the requirements of **Section 701, "Hydraulic Cement."** Type V cement shall be used unless otherwise specified.
  2. SCMs shall meet the requirements of **Section 729, "Supplementary Cementitious Materials (SCMs)."** SCMs not meeting the requirements of **Section 729, "Supplementary Cementitious Materials (SCMs),"** may be used if prior testing indicates to the satisfaction of the Engineer the ability of the CLSM with this SCM to meet these specifications.
    - a. CLSM proposed without pozzolans must submit Alkali Silica Reactivity test on mix aggregates. Testing shall be dated within one year of submission for consideration or if aggregate properties change with mix design.
    - b. CLSM without pozzolans may not be used for encasement protecting potable waterlines and/or around metallic objects such as ductile iron pipe.
  3. Water shall meet the requirements of **Section 722, "Water."**
  4. Aggregates shall have 100 percent by total weight passing the 1 inch screen and no less than 6 percent passing the No. 200 sieve. The aggregate shall have a maximum Plastic Index of 6.
  5. CLSM produced with concrete aggregates complying with ASTM C33 specifications shall have 100 percent by total weight passing the 1 inch screen and 0 - 15 percent passing the No. 200 sieve.
  6. Chemical admixtures shall meet the requirements of **Subsection 702.03.02, "Air-Entraining Admixtures,"** and **Subsection 702.03.03, "Admixtures Other Than Air-Entraining."**
    - a. Other admixtures specifically approved for CLSM may be used.
    - b. All materials proportions shall be measured and the CLSM mixed in accordance with **Section 501, "Portland Cement Concrete."**
    - c. Other proportion measuring and CLSM mixing systems are acceptable, if control can be demonstrated to be satisfactory to the Engineer.
    - d. These other methods include continuous feed, volumetric measurement of proportions, and pug mill and continuous mixing plants.
- C. If the CLSM Class I and Class II mixes do not produce a flowable consistency or exhibits excessive bleeding, the mix shall be adjusted.

1. Excessive bleeding is considered to occur when water flows from the CLSM in a manner that causes disturbance or displacement of the exposed surface of the CLSM.
  2. Mix adjustments shall include, but not be limited to: aggregate gradation, cementitious material content, admixtures, water content, or a combination of adjustments.
- D. The testing procedures of CLSM Class I, Class II, and Class III (BAF) for acceptance testing and mix design approval by the IQAC, or if required in the contract special provisions shall be as follows:
1. The material Source, which may be the Contractor, shall be sampled for acceptance or compliance testing in accordance with the requirements of ASTM D5971. Specimen molds shall be cast using ASTM D4832 "Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM Test Cylinders)." Modify ASTM D4832 as described below:
    - a. Section 6.0 (Apparatus) of ASTM D4832 as follows:
      - 1) Section 6.1 – Test cylinders shall be constructed in molds made of masonry molds (single use) with three cells in each mold. Each cell should be approximately 4-inches in diameter and approximately 7-½ inches tall.
      - 2) Section 6.1.1 – Take care when extracting the test cylinders from the molds. To aid in extracting undamaged test cylinders, wrap the masonry mold in duct tape and gently crack the mold vertically along each cell prior to casting. This should allow for an undamaged specimen when the duct tape is removed, as the mold should fall away from the specimens.
      - 3) Section 6.3 – Storage Container - Protect test cylinders from direct sunlight and freezing temperatures. Samples are to be left in field for 4 days before transporting to the laboratory.
      - 4) Replace section 6.6 – Curing Environment - Store test cylinders in an air bath between 60° to 80°F. Generally, laboratory room temperature will be sufficient for this requirement.
    - b. Modify Section 9.0 (CLSM Cylinder Molding and Curing) of ASTM D4832 as follows:
      - 1) Delete Section 9.2.2.1.
      - 2) Change 9.3.2 to: Store test cylinders in conditions replicating, as closely as possible, the conditions of the construction. However, continue to protect cylinders from direct sunlight and freezing.
      - 3) Change 9.3.3 to: On the fourth day, carefully transport test cylinders to the laboratory. Place them in the curing environment.
      - 4) Change 9.3.4 to: If test cylinders cannot be moved on the fourth day, they shall remain in their original location until such time as they can be moved, but, in no case longer than 13 days from date of cast.
    - c. Replace Section 10 (Capping the Cylinders) of ASTM D4832 with the following:

- 1) Capping shall be gypsum plaster in accordance with ASTM C617. The use of elastomeric pads will not be accepted.
  - 2) For each set of three test cylinders, test one 14-day and two 28-day for compressive strength.
- d. Add the following to Section 11 of ASTM D4832 (Compressive Strength Testing):
- 1) Compression testing should be performed on a load frame rather than a concrete compression test apparatus.
  - 2) Report the compressive strength to the nearest 5 psi.
  - 3) Correct the strength when the Length to Diameter ratio is equal to 1.74 or less by applying the corrections found in ASTM C39 or ASTM C42. Do not correct the strength if correction is less than 5 psi.
2. The cast specimens shall cure in an air bath between 60° and 80° degrees F. Generally, laboratory room temperature will be sufficient for this requirement.
3. Compressive strength testing shall be performed in accordance with ASTM D4832 with samples from each set at the ages of 14 and 28 days.
4. A report of the results shall be submitted to the Engineer.
- E. Class Special: The compressive strength testing procedures shall be as specified in the project specifications or on the project drawings.
- F. Class III - Bonded Aggregate Fill (BAF):
1. The material Source shall have it designed under the responsible charge of a Nevada PE, and the mix shall consist of a gap-graded 1/2-inch maximum size crushed gravel. The cementitious material shall be Type V cement and/or SCMs and water for a flowable type consistency.
  2. The material shall be plant mixed and placed from a truck or may be placed directly from a continuous feed mobile mixer approved by the Engineer.
  3. Due to the gap-graded nature of the material, it shall not be used where groundwater is present unless wrapped in an approved geotechnical filter fabric, and in all trench installations shall conform to **Subsection 208.03.16, "Drain Backfill."**
  4. Prepare and test concrete cylinders to evaluate the compressive strength of the BAF as described in Item D of this subsection. In addition, BAF requires a visual inspection that shall be documented in a report to the Engineer summarizing the inspection to be performed as follows:
    - a. After the first batch is placed and initially cured, excavate to the bottom of the pipe or structure.
    - b. If a self-supporting vertical face is maintained, the material is functioning properly.

#### **704.03.08 AGGREGATE FOR PORTLAND CEMENT TREATED BASE**

- A. This aggregate shall conform to the following requirements:

**Table 13 – Portland Cement Treated Base Gradation Acceptance Limits**

Sieve Sizes	Percentage by Dry Weight Passing Sieve
3-Inch	100
2-Inch	90-100
No. 4	35-75
No. 200	20

**Table 14 – Portland Cement Treated Base Acceptance Limits**

Test	Test Method	Requirements
Sieve Analysis	AASHTO T27	Table 13
Sampling Aggregate from Calibrated Conveyor stream or belt cut <sup>12</sup>	AASHTO T2	1/1000 Tons per day or portion thereof
Percentage of Wear (500 Rev.)	AASHTO T96	45% Maximum

- B. Aggregate for cement or lime treated bases will be sampled as follows:
1. Where the material is being mixed at a stationary plant, samples will be taken from the conveyors just prior to delivery to the mixer and prior to adding lime or cement.
  2. Where material is being mixed on the roadbed, samples will be taken after the material has been placed on the roadbed and processed and prior to adding cement or lime.

**704.03.09 SHOULDERING MATERIAL**

- A. This aggregate shall conform to the following requirements:

**Table 15 – Shouldering Material Acceptance Limits**

Sieve Sizes	Percentage by Dry Weight Passing Sieve
1-Inch	100
3/4-Inch	90-100
No. 4	35-65
No. 16	15-40
No. 200	2-6

**704.03.10 AGGREGATE BASE MATERIAL WITH RECYCLED ASPHALT PAVEMENT (RAP) AND CONCRETE**

- A. The use of recycled asphalt pavement or recycled concrete for Type II Aggregate Base is permitted with the following requirements:
1. The material must conform to the requirements of **Subsection [704.03.04](#) “Type II Aggregate Base**
  2. The maximum ratio of crushed concrete to Type II Aggregate Base is 50%. Recycled materials must be substantially free of foreign matter including but not limited to asphalt, base, dirt, reinforcing steel, and have at most 1.5% deleterious material.

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<sup>12</sup> Sampling from a stockpile permitted only after approval of the Engineer. The conveyor device shall be calibrated every 3 months and record attached to sample document.

3. The maximum ratio of the crushed recycled asphalt concrete pavement (RAP) to Type II Aggregate Base is 30%. The mean oil content shall be 1.2% with a +0.3% tolerance. The Total Oil Content of the blended material (virgin aggregate and RAP) shall not exceed 1.5%.
- B. The maximum qualification period is six (6) months for aggregate base materials blended with recycled aggregates. The entire qualification process must be completed prior to the first day of April and the first day of October of each calendar year. The report format, as outlined in **Subsection 704.04.06 "Report Format"** shall include the sieve analysis for RAP or recycled concrete stockpile, Blended aggregated, the RAP binder content and blended binder content.

#### **704.03.11 100% RECYCLED AGGREGATE BASE MATERIAL**

- A. 100% Recycled Aggregate Base shall be composed of a combination of imported materials including native soil and rock, concrete, RAP. The individual components of the aggregate base shall comply with the following percentages:
1. Minimum of 50% imported native soil and/or rock
  2. Maximum of 50% recycled concrete
  3. Maximum of 30% RAP
  4. Maximum of 5% Recycled concrete roof tiles and CMU blocks.
- The sources of material shall be clearly identified in individual stockpiles prior blending. Submit copies of the stockpile location, makeup, and individual quantity of combined aggregate with mix design.
- B. The use of recycled asphalt pavement and/or recycled concrete components for 100% Recycled Aggregate Base shall comply with the following requirements:
1. The maximum ratio of crushed concrete must be substantially free of foreign matter including but not limited to asphalt, base, dirt, reinforcing steel, and have at most 1.5% deleterious material.
  2. The total oil content of type II produced with recycled asphalt concrete shall not exceed 1.5% oil by weight.
- C. Import sources shall be identified for individual stockpiles of 100% Recycled Aggregate Base. They shall comply with the following requirements.
1. For individual stockpiles of 100% Recycled Aggregate Base, the native source(s) shall have consistent gradations, chemical properties, physical properties, and shall be of a similar soil classification.
- D. The maximum qualification period is three (3) months for 100% Recycled Aggregate Base. The entire qualification process must be completed prior to the first day of February, April, July, and October of each calendar year. The report format, as outlined in **Subsection 704.04.06 "Report Format"**, shall include the sieve analysis for RAP or recycled concrete stockpile, blended aggregated, the RAP binder content and blended binder content. The report will need to identify the source(s) of the native soil and/or rock. Sites are allowed 1 to 4 different stock piles of recycled material. Each individual stockpile will require its own listing on the IQAC website.

## SOURCE QUALITY CONTROL TESTING

**704.04.01 GENERAL**

- A. There are 3 testing aspects to Source material acceptance and quality control.
  - 1. Testing by the Source for submittal posting on the IQAC website of qualified materials.
  - 2. Source Quality Control Testing required to ensure consistent material production.
  - 3. Contractor project quality control Source testing for non-qualified materials.
- B. The acceptance of the Source material shall be at the production plant while the acceptance of the Contractor-placed material is at the project site.
- C. Any laboratory submitting to an agency shall be R-18 AASHTO accredited in the appropriate test method in accordance with Table 16, "Source Quality Control Testing Requirements," where applicable and testing reviewed and stamped by a Nevada professional engineer who has responsible charge of the work. The use of a professional engineer by the Source could be the Source staff engineer or third party, but the professional engineer must have responsible charge of the testing and/or inspection.

**704.04.02 IQAC ANNUAL MATERIAL PREQUALIFICATION**

- A. Each individual location or "pit" shall be referred to as a "Source." The responsibility for testing and inspection is the material Source. Material shall be tested, inspected, and certified in accordance with Table 16 "Source Quality Control Testing Requirements." The Source shall submit to the IQAC agency engineer assigned for that Source. The reviewing agency is listed on the IQAC website page next to the Source material.
- B. Test data shall be included with the certifying document.
- C. The maximum qualification period is 1 year for 100% native material, 6 months for virgin aggregate blended with crushed concrete or RAP, or 3 months for 100% recycled aggregate base. The entire qualification process shall be completed in accordance with the sections above prior to the first day of April, or for virgin aggregates blended with crushed concrete or RAP, the first day of April and the first day of October of each year and in the case of 100% recycled aggregate base, prior to the first day of February, April, July, and October of each calendar year. This includes, but is not limited to, submittal, agency review, all required retesting, and qualification from the IQAC member.

**704.04.03 MATERIAL TOLERANCES AND PROHIBITED MATERIALS**

- A. Materials shall comply with the following tolerances and import sources shall be free of any contaminants as listed below.
  - 1. The allowed variance in the material proctor value and optimum moisture content, is  $\pm 3$  PCF and  $\pm 2\%$  respectively
  - 2. Unsuitable import materials/contaminants
    - a. Gypsum
    - b. Lightweight Concrete
    - c. Plastics
    - d. Organic materials

- e. Building materials including: clay roof tiles, shingles, pipe, electrical wire, or other materials that would be detrimental to the durability of the aggregate base.

#### **704.04.04 NON-PREQUALIFIED MATERIALS**

- A. If the material is not posted on the IQAC web page, the Source may elect to submit non-qualified material to the Engineer for approval prior to use that complies with the above noted specification and shall have been tested within 60 days of the intended use.

#### **704.04.05 SUBMITTAL**

- A. All tests specified in this section shall be performed.
  - 1. The report(s) shall include any graphical representation of plotted data such as the R-value and the Proctor value(s) along with the pit name and location.
  - 2. The most current ASTM, AASHTO, NDOT, and AWWA methods shall be used when performing the tests.
- B. All samples shall be "cut" from the "belt." When circumstances do not allow for sampling during production, the Source shall coordinate with the Engineer to identify an alternative plan for sampling.
- C. IQAC Annual Submittal
  - 1. For the purposes of IQAC submittal, the Engineer is the IQAC reviewing agency as noted on the IQAC web page.
  - 2. For the annual submittal by the supplier, the material to be approved for use as aggregate shall be obtained and "split" by an AASHTO accredited laboratory with the Engineer present at the time the sample is obtained with the sample large enough for a full suite of testing for the Source and Engineer.
  - 3. The Engineer shall be notified a minimum of 48 hours prior to obtaining the sample.
  - 4. If the Engineer is not present during the sampling of the material, the results for that sample will not be accepted.
  - 5. Sampling shall be performed during normal working hours for the Engineer.
  - 6. If the Source laboratory results are in compliance with the above noted specifications, Source shall submit the test report to the Engineer within 21 days of sampling requesting the review and approval of the materials for the proposed use of the material.
  - 7. Notification by the Source of samples not in compliance with the above noted specifications is requested but not required. Samples without notification or a qualification submittal within the 21-day period will be assumed by the IQAC to be outside the above noted specifications.
  - 8. The agency Engineer for a particular pit may accommodate minor adjustments for "tuning" of an operation. This courtesy shall not be extended during the qualification process.
- D. Non-qualified materials (materials not posted on the IQAC list)
  - 1. The material to be approved for use as aggregate shall be obtained and "split" by an AASHTO accredited laboratory with the Engineer present at the time the sample

is obtained with the sample large enough for a full suite of testing for the Source and Engineer.

- a. The Engineer shall be notified a minimum of 48 hours prior to obtaining the sample.
  - b. If the Engineer is not present during the sampling of the material, the results for that sample will not be accepted.
  - c. Sampling shall be performed during normal working hours for the Engineer.
  - d. If the Source laboratory results are in compliance with the above noted specifications, the Source shall submit the test report to the Engineer within 21 days of sampling with a letter requesting the review and approval of the materials report for the proposed use of the material.
2. Notification by the Source of samples not in compliance with the above noted specifications is requested but not required.
- a. Samples without notification or a qualification submittal within the 21-day period will be assumed by the IQAC to be outside the above noted specifications.
  - b. The Source shall submit the material test report to the Engineer no earlier than 60 days and no later than 14 days prior to use.
3. The qualification is for one project only.

#### **704.04.06 REPORT FORMAT**

- A. The report shall be prepared and stamped by, or under the direction of, a professional engineer registered in the state of Nevada. The report shall be on the standard IQAC<sup>13</sup> form and shall include the pit name and location. The report shall include the following:
1. Recommendation by the Source Professional Engineer.
  2. The testing results in accordance with the appropriate Table 16, "Source Quality Control Testing Requirements," test methods and reporting requirements, along with any graphs and charts.
- B. When "no exceptions" are taken, a conditional posting on the web site will be provided by the IQAC within 10 days of the receipt of the submittal.
- C. Discrepancies between test results will be reviewed on a case-by-case basis. The Engineer will notify the aggregate producer of substantial test variations within 10 days of receipt of the qualification submittal.

#### **704.04.07 SAMPLING AND TESTING**

- A. When the Contractor/Material Source or Engineer acquires aggregate samples at an aggregate production plant, the plant shall provide a calibrated mechanical means for obtaining samples.
1. If a mechanical means is not provided, a belt cut from a stopped conveyor will be required.

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<sup>13</sup> The form is on the IQAC website, or use an Agency approved form.

2. Any mechanical sampling device shall be approved by the Engineer prior to starting the respective phase of the project, or shall have been approved as part of a prior plant inspection by the Engineer or the Engineer's representative.
  3. The sampling device shall be so constructed to provide for simultaneous "cutting" of the entire section of material being discharged or conveyed, and so constructed that small representative samples may be taken frequently and these samples combined to form the complete sample.
  4. The reference method for the mechanical procedure shall be a "belt cut" sample taken from a stopped conveyor belt.
  5. Samples of the finished product of the plant shall be obtained prior to or as the material leaves the conveyor belt for the bin or stockpile.
- B. Test results run from samples taken will be furnished to the Engineer by the Contractor or the Contractor's representative. The results of such tests shall not be the basis for final acceptance of the material.
- C. Sampling for final acceptance of materials will be as required in the appropriate USS sections and in general shall comply with the AASHTO requirements, where applicable, and with any exception to the method(s) listed on the IQAC website.

**Table 16 – Source Quality Control Testing Requirements<sup>14</sup>**

Spec Section	Description	Item	Reference Specification and/or Test Procedure	Frequency
<a href="#">704.03.02</a> , <a href="#">704.03.03</a> , <a href="#">704.03.04</a> , <a href="#">704.03.08</a>	Drain Rock, Type I, Type II Aggregate, Cement treated base	Submittal	IQAC and/or Agency Requirements	Annually for IQAC Source Approval OR per project
		Sampling from calibrated conveyor stream or belt cut	AASHTO T2	1/day at plant
		Sieve Analysis	AASHTO T11 & T27	1/day at plant
		Percentage of Wear (500 Rev.)	AASHTO T96	Annually for Source Approval OR per project
<a href="#">704.03.04</a> , <a href="#">704.03.05</a> , <a href="#">704.03.06</a>	Drain rock, Type II, and Type III aggregate around water pipe	Total Available Water-Soluble Sulfates <sup>15</sup>	AWWA (SM) 3500-NaD AWWA (SM) 4550 E	1/month at plant
<a href="#">704.03.03</a> , <a href="#">704.03.04</a>	Type I and Type II Aggregate	Plasticity Index	AASHTO T90 <sup>16</sup>	1/day at plant
		Liquid Limit	AASHTO T89	1/day at plant
		Proctor	AASHTO T180	1/20,000 CY at source
		Proctor 100% Recy.	AASHTO T180	1/5,000 CY at source
		Resistance (R Value) or Resilient Modulus	ASTM D2844	Annually for IQAC Source Qualification OR per project
		AASHTO T307	Annually for IQAC Source Qualification OR per project	

<sup>14</sup> Review the IQAC website for any exceptions to the listed test methods.

<sup>15</sup> Required only for placement around waterline pipe.

<sup>16</sup> Test specimens shall be prepared following the dry preparation procedure AASHTO T87.

**Table 16 – Source Quality Control Testing Requirements<sup>14</sup>**

<b>Spec Section</b>	<b>Description</b>	<b>Item</b>	<b>Reference Specification and/or Test Procedure</b>	<b>Frequency</b>
<a href="#"><u>704.03.07</u></a>	CLSM Class I, II, & III	Mix Design	<b>USS <a href="#"><u>704.03.07</u></a></b>	Annually for IQAC Source Qualification OR per project
		Compressive Strength	<b>USS <a href="#"><u>208.02.07</u></a> &amp; ASTM D4832</b>	Annually for IQAC Source Qualification OR per project
	CLSM Class III-BAF	Visual Inspection Report	<b>USS <a href="#"><u>208.02.07</u></a> Split cylinders</b>	Annually for IQAC Source Qualification OR per project