

55.3 AGGREGATE PRODUCTION AND STOCKPILING

55.3.1 GENERAL

The Work covers the general requirements for production, gradation, stockpiling, and pit operations for specified aggregate materials.

55.3.2 AGGREGATE SOURCE REQUIREMENTS

For any aggregate source used, including Department Sources the following shall apply:

- ! The Contractor shall ensure a Development and Reclamation Approval or a lease or license to extract from Alberta Environment and a clearance from the Archaeological Survey of Alberta are in place prior to commencement of the Work.
- ! The Contractor assumes full responsibility for the quantity and quality of the material in the source.
- ! The Contractor shall acquire the necessary rights to take materials from the sources.
- ! The Contractor shall explore and develop the sources.
- ! The Contractor shall save the Department harmless from any and all claims resulting from the use of the aggregate sources.
- ! The Department will not consider the use of aggregates from existing stockpiles unless the Contractor can satisfy the Engineer that the aggregate in question meets all required specifications. Agreement by the Department that such pre-prepared aggregates can be used will not constitute acceptance of the material in stockpile. Acceptance of such material will be based on testing done by the Engineer as the material is incorporated into the Work.

55.3.3 EQUIPMENT

The Contractor shall supply all equipment necessary to complete the Work.

55.3.4 PROCEDURE

55.3.4.1 General

Aggregate produced from all sources shall comply fully with the specifications, and the Contractor shall

recognize and satisfy himself as to the type and amount of work that may be necessary to produce the material required. The aggregate shall meet the specified requirements as shown on Table 55.3.4.1(A) for the material specified. The Contractor shall adjust and modify aggregates as required in order to meet specification requirements.

The crushed aggregate shall be composed of sound, hard and durable particles of sand, gravel and rock, and shall be free from elongated particles, injurious quantities of flaky particles, soft shales, organic matter, clay lumps and other foreign matter.

In Department sources, all material up to and including 300 mm diameter shall be crushed.

Acceptance of processed aggregates shall take place when they are in their final position and have met all the requirements of the Contract. The Engineer may test at any time and reject material that does not meet specifications. The final position for a crushing and stockpiling bid item will be the stockpile.

TABLE 55.3.4.1(A), SPECIFICATIONS FOR AGGREGATE

DESIGNATION		1			2				3				4			5		6		7	8	9		
CLASS (MM)		10	12.5	16	*16(N2)	20	25	40	12.5AW	12.5BW	12.5C	16	20	25	40	10A	10B	80	125	40	40	8		
PERCENT PASSING METRIC SIEVE (CGSB 8-GP- 2M)FM	125 000																	100						
	80 000																	100						
	50 000																	55-100	55-100					
	40 000							100							100						100	100		
	25 000							100	70-94						100				38-100	38-100				
	20 000							100	82-97						100									
	16 000				100	100	84-94	70-94	55-85										32-85	32-85				
	12 500			100	80-92	89-100				100	100	100	72-95											
	10 000	100	83-92	70-84	78-94	63-86	52-79	44-74	35-65	55-75	70-93	53-82	35-77	30-77	25-72	100	100				85-100	78-95		
	8 000																						100	
	5 000	60-75	55-70	50-65	55-70	40-67	35-64	32-62	0-15	0-15	30-60	27-54	15-55	15-55	8-55	70-90	45-70	20-65	20-65			60-85	85-100	
	1250	26-45	26-45	26-45	26-45	20-43	18-43	17-43	0-3	0-3	9-28	9-28	0-30	0-30	0-30	20-45	20-45				40-100	27-57	45-75	
	630	18-38	18-38	18-38	18-38	14-34	12-34	12-34																30-50
	315	12-30	12-30	12-30	12-30	9-26	8-26	8-26				0-15	0-15					9-22	9-22	6-30	6-30	17-100	5-29	18-30
160	8-20	8-20	8-20	8-20	5-18	5-18	5-18				0-11	0-11					5-15	5-15				0-15	10-21	
80	4-10	4-10	4-10	4-10	2-10	2-10	2-10	0-0.3	0-0.3	0-8	0-8	0-12	0-12	0-12	0-10	0-10	2-10	2-15	6-30	0-5	5-15			
% FRACTURE BY WEIGHT (2 FACES)	ALL +5000	60+	60+	* SEE NOTE (N1)	60+	60+	60+	50+	75+ (100% 1 Face)	75+ (100% 1 Face)	60+	60+	40+	40+	25+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PLASTICITY INDEX (PI)	NP	NP	NP	NP	NP	NP-6	NP-6	NP-6	N/A	N/A	NP-4	NP-4	NP-8	NP-8	NP-8	NP-6	NP-6	NP-8	NP-8	NP-5	NP-5	NP		
L.A. ABRASION % LOSS MAX.	40	40	40	40	50	50	50	50	35	35	35	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35		
FLAKINESS INDEX	N/A								MAX 15				N/A											
COEFFICIENT OF UNIFORMITY (Cu)	N/A																			3+	N/A			

Designations:

- Designation 1 - Asphalt Concrete Pavement Designation
- Designation 2 - Base Course Aggregate
- Designation 3 - Seal Coat Aggregate
- Designation 4 - Gravel Surfacing Aggregate
- Designation 5 - Sealing Material
- Designation 6 - Pit-run Gravel Fill
- Designation 7 - Cement Stabilized Base
- Designation 8 - Granular Filter Aggregate
- Designation 9 - Slurry Seal Aggregate

*** Notes:**

- N1. Asphalt Concrete Mix Type 1 - 90+ (100% 1 face)
Asphalt Concrete Mix Type 2 - 70+
Other Asphalt Concrete Mix Types - 60+
- N2. Designation 2 Class 16 Material is for ASBC
- N3. For crushed aggregates other than all Designation 9 materials, a tolerance of three percent in the amount passing the maximum size sieve will be permitted provided all oversize material passes the next larger standard sieve size.

55.3.4.2 Sampling and Testing

55.3.4.2.1 General

In all sources, quality control testing is the responsibility of the Contractor. Tests performed by the Engineer will be quality assurance tests and will not be considered as quality control tests.

55.3.4.2.2 Test Methods

Unless otherwise specified, the latest edition of the test methods shown in Table 55.3.4.2.2(A) will be used to determine aggregate material characteristics.

**TABLE 55.3.4.2.2(A)
TEST METHODS USED TO DETERMINE AGGREGATE MATERIAL CHARACTERISTICS**

TESTS	STANDARD
Sampling, Gravel and Sand	ATT-38
Sieve Analysis	ATT-25 or 26
Sieve Analysis, 80 000 Fm Minus, Part II - Pit-Run Contamination, - 5 000 Fm Sieve Analysis	ATT-25, Part II
Determining the Liquid Limit of Soils	AASHTO T 89
Dry Strength, Non-Plastic Aggregates	ATT-54
Determining the Plastic Limit and Plasticity Index of Soils	AASHTO T 90
Percent Fracture	ATT-50
Classification of Soils for Engineering Purposes (for definition of Coefficient of Uniformity, Cu)	ASTM D2487
L.A. Abrasion	AASHTO T 96
Flakiness Index	ATT-49
Detrimental Matter in Coarse Aggregate	TLT-107

Note:

In all Test Methods used as reference in this specification, metric sieves as specified in Canadian General Standards Board specification 8-GP-2M shall be substituted for any other specified wire cloth sieves in accordance with Table 55.3.4.2.2(B)

TABLE 55.3.4.2.2(B)

SIEVES IN ACCORDANCE WITH: AASHTO DESIGNATION: M 92 ASTM DESIGNATION: E 11	METRIC SIEVES IN ACCORDANCE WITH: CGSB SPEC. 8-GP-2M
(U.S. STANDARD SERIES) (OPENING AND DESIGNATION)	
125.0 mm 5"	125 000
75.0 mm 3"	80 000
63.0 mm 2-1/2"	63 000
50.0 mm 2"	50 000
37.5 mm 1-1/2"	40 000
25.0 mm 1"	25 000
19.0 mm 3/4"	20 000
16.0 mm 5/8"	16 000
12.5 mm 1/2"	12 500
9.5 mm 3/8"	10 000
4.75 mm #4	5 000
2.36 mm #8	2 500
2.00 mm #10	2 000
1.70 mm #12	1 600
1.18 mm #16	1 250
0.850 mm #20	800
0.600 mm #30	630
0.425 mm #40	400
0.300 mm #50	315
0.150 mm #100	160
0.075 mm #200	80
0.045 mm #325	45

55.3.4.2.3 Quality Control Testing

The Contractor shall provide and maintain equipment and qualified personnel to perform all field testing necessary to determine and monitor the characteristics of the materials produced and incorporated into the Work.

The Contractor shall provide safe and convenient means for accurately and representatively sampling each aggregate stream being produced during all screening, splitting and crushing processes.

55.3.4.3 Pit Operations

All reject material produced in a Department source shall be disposed of as directed by the Engineer and the Contractor shall have no claim to the material.

In all sources, the Contractor shall comply with the conditions set by Alberta Environment when removing frozen topsoil, subsoil and inorganic overburden.

All aspects of clearing, removal of overburden, protection and safety of livestock, general pit management and clean up shall be the responsibility of the Contractor except where the Contractor elects to use a Department Source, in which case the pit management and development will conform to the Department's development and operation plan.

55.3.4.4 Reclamation

The standards and conditions for appropriate development and reclamation as required by Alberta Environment shall apply to all sources.

55.3.4.5 Stockpiling

When aggregate stockpiles are specified or used as part of maintenance work, the following shall apply.

- ! When stockpiling is specified in the Contract, the location of the stockpile sites shall be determined by the Contractor unless otherwise specified or required by the Engineer.

- ! If, in order to expedite his operation, the Contractor constructs temporary stockpiles at sites of his own choosing, he shall arrange for such sites and be responsible for them in all respects, including all costs for clearing, removal and salvage of overburden and other site preparation and reclamation. The Contractor shall also obtain approvals and clearances from Alberta Environment and the Archaeological Survey of Alberta for these sites prior to commencement of the work.

 - ! Stockpiles shall not be constructed at locations or by methods that will interfere with or damage any utilities such as power lines, telephone lines, pipelines, and underground utilities.

 - ! Sites shall be cleared to the required dimensions. Topsoil and subsoil shall be separately excavated to the full depth or 300 mm, whichever is greater, and stockpiled separately. Stockpile sites shall be shaped to a uniform smooth surface and graded to ensure positive drainage.

 - ! Stockpiles shall be constructed by first distributing material uniformly over the entire base, and building upwards in successive layers not exceeding a thickness of 2 m.

 - ! Construction operations shall be controlled to prevent segregation of the various particle sizes.

 - ! Crushed aggregate or pit-run shall not be pushed or dumped over the edges or down the faces of stockpiles.

 - ! Stacking conveyors will not be permitted for stockpiling Designation 2, all classes, and Designation 3 Classes 12.5C and 16 crushed aggregate.

 - ! Stacking conveyors may be used for Designation 1 material upon approval of the Engineer.

 - ! Stacking conveyors may be used for stockpiling all other designations and classes of aggregate.

 - ! Completed stockpiles shall be neat and regular in form and shall be constructed to occupy the smallest feasible area taking into consideration the bearing capacity of the foundation soils and the requirements of the Occupational Health and Safety Act.

 - ! If different types of material are to be stockpiled, the piles shall be located and constructed so that no intermixing of material will occur.
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55.3.4.6 Aggregate Production

The Contractor shall produce aggregates conforming to the specifications for the designations and classes called for in the Contract.

When required by the Engineer, the Contractor shall submit a written proposal to the Engineer, detailing aggregate processing procedures intended to be used. These proposed procedures will require the approval of the Engineer. Aggregates produced prior to this approval will not be accepted.

When required by the Engineer, the Contractor shall notify the Engineer a minimum of two days in advance of the start of aggregate production to allow the visual inspection of the process and testing of the production as deemed necessary by the Engineer. This inspection and testing will not relieve the Contractor of any responsibility in producing aggregate materials that meet all specification requirements.

Any recombining of aggregates or addition of blend materials shall be performed so that a uniform mix of the various sizes is achieved.

The Contractor shall ensure that manufactured fines are retained in the crushed aggregate stockpile.

55.3.5 MEASUREMENT AND PAYMENT

The production of aggregates including any aggregate gradation adjustments and modifications will not be paid for separately. The cost of this Work will be considered included in the unit price bid of the work item for which the aggregates are being produced.

The costs of quality control, obtaining approvals and rights to use an aggregate source, the exploration, development and reclamation of the sources, clearing and overburden removal, and the erection and removal of temporary fences will be considered incidental to the Work and will not be paid for separately.