Kenny, Ann

From: Kenny, Ann
Sent: Tuesday, October 23, 2001 2:15 PM
To: Fitzpatrick, Kevin; Drabek, John; Abbasi, Ed
Cc: Hellwig, Raymond; Marchioro, Joan (ATG); Young, Tom (ATG)
Subject: FW: Processed Materials

TopSoilSpecifications.doc BaseCourseSpecifications.doc SpecificationsUtilities.doc GeneralEmbankmentSpecification...

For your evaluation from the Port re fill criteria.

Please review and get back to me with your comments and then we should set up a meeting with them to discuss.

Thanks.

Ann

-----Original Message-----
From: Leavitt, Elizabeth [mailto:leavitt.e@portseattle.org]
Sent: Tuesday, October 23, 2001 2:00 PM
To: Kenny, Ann; Hellwig, Raymond
Cc: Clark, Beth; Agid, Paul; Walsh, Dave; Tom Walsh (E-mail); Thomson, Tim
Subject: FW: Processed Materials

Ann- This e-mail follows up the meeting we had a few weeks ago to begin discussions on which projects and types of materials the "fill criteria" condition of the 401 might apply to. As promised, attached are the specifications for the various types of fill that are commonly used, and will be spec'd for the embankment. We are proposing, for your consideration, that topsoil, utility backfill and base course not be subject to fill criteria, and that the bulk of the soils used, general embankment material, would be subject to testing/the condition. Generally speaking, the first three types of material are highly processed and graded as to size and shape (eg: have sharp angles that allow for important physical properties) , have a higher percentage of gravel and rock, and are used in far lesser quantity than the general embankment materials. The first three are also used in certain zones of the fill rather than overall in the embankment.

After you and your team have had a chance to review this, we can meet and advance the discussion further. Thanks

> -----Original Message-----
> From: Clark, Beth
> Sent: Tuesday, October 23, 2001 12:05 PM
> To: Leavitt, Elizabeth
> Cc: Agid, Paul; Walsh, Dave

Hellwig
EXHIBIT NO. 105
1-8-02
M. Green

AR 017862

> Subject: Processed Materials
>
> Elizabeth,
>
Attached are relevant portions of the specifications for various
materials
> that do not clearly fall under Condition E of the 401. These include:
(1)
> topsoil; (2) utility backfill; and (3) base course. Reviewing the
> specifications you see that these materials must meet very specific
> physical requirements for grain size, shape, strength, etc. These
> materials are typically purchased from commercial sites that have the
> capabilities to process the materials to the required specifications,
and
> are used in much smaller volumes than the general embankment fill
> material. I have also included the general embankment fill borrow
> material specifications. These are the materials that will be used to
> construct the bulk of the Third Runway Embankment. These materials
are
> and will be reviewed for environmental suitability under the 401
> certification. I should also note that these discussions regarding
the
> utility backfill will in no way negate the proposed BMP requirements
for
> utility corridors under Condition F.1.
>
> If it would be useful I would be glad to provide you with the complete
> copy of the specifications. Please let me know if you have any
additional
> questions.
>
>
> Beth Clark

>
> <<TopSoilSpecifications.doc>> <<BaseCourseSpecifications.doc>>
> <<SpecificationsUtilities.doc>>
<<GeneralEmbankmentSpecifications.doc>>

Port of Seattle
Summary
Topsoil Specifications

Section 02314 - Topsoiling

TOPSOIL. Topsoil shall be the surface layer of soil with no admixture of refuse or any material toxic to plant growth and it shall be reasonably free from subsoil and stumps, roots, brush, stones (2 inches or more in diameter), clay lumps or similar objects. Brush and other vegetation which will not be incorporated with the soil during handling operations shall be cut and removed. Ordinary sods and herbaceous growth such as grass and weeds are not to be removed but shall be thoroughly broken up and intermixed with the soil during handling operations. The topsoil or soil mixture, unless otherwise specified or approved, shall have a pH range of approximately 5.5 pH to 7.6 pH, when tested in accordance with the methods of testing of the association of official agricultural chemists in effect on the date of invitation of bids. The organic content shall be not less than 3% nor more than 20% as determined by the wet-combustion method (chromic acid reduction). There shall be not less than 20% nor more than 80% of the material passing the 200 mesh sieve as determined by the wash test in accordance with ASTM C 117.

Port of Seattle
Summary
Base Course Specifications

AR 017866

Section 02721 - Subbase Course
MATERIALS

The subbase material shall consist of hard durable particles or fragments of granular aggregates. This material will be mixed or blended with fine sand, clay, stone dust, or other similar binding or filler materials produced from approved sources. This mixture must be uniform and shall comply with the requirements of these specifications as to gradation, soil constants and shall be capable of being compacted into a dense and stable subbase.

Sieve designation (square openings) Percentage by weight passing sieves as per ASTM C 136.

3 inch (75.0 mm)	100
No. 10 (2.0 mm)	20-100
No. 40 (0.450 mm)	5-60
No. 200 (0.075 mm)	0-15

Section 02722 – Base Course

MATERIALS

1. Gravel Base shall consist of naturally occurring or screened gravel. It shall be free of wood wastes or other extraneous or objectionable materials. The maximum particle size shall not exceed 2/3 of the depth of the layer being placed. Gravel Base, shall meet the following requirements for grading and quality when placed in the hauling vehicle for delivery to the site:

Passing	% By Weight
¼" sq. opening	25 min.
No. 200 sieve	10 max.
Dust Ratio:	2/3 max.
Percent passing No. 200	
Percent passing No. 40	
Passing #40	
Sand Equivalent	30 min.

Gravel Base material retained on a 1/4-inch square sieve shall not contain more than 0.20% by weight of wood waste.

2. Crushed Rock Base shall be manufactured from ledge rock, talus, or gravel. The materials shall be uniform in quality, free from wood, roots, bark and other extraneous material. Crushed Rock Base shall meet the following requirements for grading and quality when placed in the hauling vehicle for delivery to the site:

Passing	Wt. % for Lower Course	Keystone or Top Course
1-1/4" sq. sieve		100
5/8" sq. sieve	50 to 80	100
¼" sq. sieve	30 to 50	55 to 75
U.S. No. 40 sieve	3 to 18	8 to 24
U.S. No. 200 sieve	7.5 max.	10 max.
Sand Equivalent	40 min.	40 min.

Not less than 75 percent of Crushed Rock Base materials retained on a U.S. No. 10 sieve shall have at least one fractured face produced by mechanical crushing.

3. Railway Ballast shall meet the following requirements for grading and quality when placed in the hauling vehicle for delivery to the site:

Passing	Wt. %
1-1/2" sq. sieve	100
1" sq. sieve	60 - 90
3/4" sq. sieve	45 - 75
1/2" sq. sieve	35 - 60
3/8" sq. sieve	100% retained

Railway Ballast material shall not contain more than a total of 1% by weight of wood wastes, clay lumps, dust, or other extraneous material. Not less than 85% of Railway Ballast material retained on a 3/8" sieve shall have at least one fractured face.

4. Shoulder Ballast shall consist of crushed, partially crushed, or naturally occurring granular material. Shoulder Ballast shall meet the following requirements for grading and quality when placed in the hauling vehicles for delivery to the site.

Passing	Wt. %
2-1/2" sq. sieve	100
3/4" sq. sieve	40 - 80
1/4" sq. sieve	5 max.
U.S. No. 100 wet sieve	0 - 2
Fracture (each size coarser than U.S. No. 10 sieve)	50 min.

That portion of Shoulder Ballast retained on a 1/4-inch sieve shall not contain more than 0.2% wood waste.

Section 02723 - Aggregate Base Course

MATERIALS

This item shall consist of a base course composed of [crushed] [uncrushed] coarse aggregate bonded with either soil or fine aggregate or both. It shall be constructed on a prepared underlying course in accordance with these specifications and shall conform to the dimensions and typical cross section shown on the plans.

1. **Uncrushed coarse aggregate** shall consist of hard, durable particles or fragments of stone or gravel mixed or blended with sand, stone dust, or other similar binding or filler materials produced from approved sources.
2. **Crushed coarse aggregate** shall consist of both fine and coarse fragments of crushed stone, crushed slag, or crushed gravel mixed or blended with sand, screenings, or other similar approved materials. The crushed stone shall consist of hard, durable particles or fragments of stone and shall be free from excess flat, elongated, soft or disintegrated pieces, dirt, or other objectionable matter.

The gradation of the uncrushed or crushed material shall meet the requirements of one of the gradations given in Table 1 when tested in accordance with ASTM C 117 and C 136.

Sieve Designation	Percentage By Weight Passing Sieves		
	2" maximum	1 ½" maximum	1" maximum
2 inch (50.0 mm)	100	--	--
1-1/2 inch (37.0 mm)	--	100	--
1 inch (25.0 mm)	55-85	70-95	100
3/4 inch (13.0 mm)	50-80	55-85	70-100
No. 4 (4.75 mm)	30-60	30-60	35-65
No. 40 (0.45 mm)	10-30	10-30	15-30
No. 200 (0.075 mm)	5-15	5-15	5-15

Section 02724 - Crushed Aggregate Base Course

MATERIALS

This item consists of a base course composed of crushed aggregates constructed on a prepared course in accordance with these specifications and in conformity to the dimensions and typical cross sections shown on the plans.

Aggregates shall consist of clean, sound, durable particles of crushed stone, crushed gravel, or crushed slag and shall be free from coatings of clay, silt, vegetable matter and other objectionable materials and shall contain no clay balls. Fine aggregate passing the No. 4 (4.75 mm) sieve shall consist of fines from the operation of crushing the coarse aggregate. If necessary, fine aggregate may be added to produce the correct gradation. The fine aggregate shall be produced by crushing stone, gravel, or slag that meet the requirements for wear and soundness specified for coarse aggregate.

Gradation Requirements. The gradation (job mix) of the final mixture shall fall within the design range indicated in Table 1, when tested in accordance with ASTM C 117 and C 136. The final gradation shall be continuously well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on an adjacent sieve or vice versa.

Sieve Size	Design Range Percentage by Weight Passing Sieves	Job Mix Tolerances Percent
2 in (50.0 mm)	100	0
1-1/2 in (37.0 mm)	95-100	+/- 5
1 in (25.0 mm)	70-95	+/- 8
3/4 in (19.0 mm)	55-85	+/- 8
No. 4 (4.75 mm)	30-60	+/- 8
No. 30 (0.60 mm)	12-30	+/- 5
No. 200 (0.075 mm)	0-8	+/- 3

PORT OF SEATTLE

SUMMARY

UTILITY BACKFILL SPECIFICATIONS

SECTION 02300 – EARTHWORK

UTILITIES BEDDING:

Clean, granular, well-graded sand and gravel material of which 100% will pass the United States Standard 3/4-inch opening and not more than 3% will pass the United States No. 200 (wet sieve) with a minimum sand equivalent of 50%. At least 50% of the particles retained on a U.S. No. 4 sieve shall have at least one fractured face.

GRAVEL BACKFILL FOR DRAINS:

Gravel Borrow shall conform to the requirements of paragraph 9-03.12(4) of WSDOT Standard Specifications, "Gravel Backfill for Drains."

Sieve Size	Percent Passing	
1" square	100	---
¾" square	80	100
3/8" square	10	40
U.S. No. 4	0	4
U.S. No. 200	0	2

Port of Seattle

Summary

Fill Borrow Material

Third Runway Embankment Specifications

Section 02330 - Excavation & Embankment (FAA)

Fill borrow materials from multiple groups may be used to construct the multiple zones or portions of the embankment. A given fill borrow group may be compacted to a different criteria in order to meet the requirements for the different zones of the fill.

Fill borrow material soil particles shall have a minimum specific gravity of at least 2.55.

Fill borrow material shall meet the following gradations when tested in accordance with ASTM C 136:

Fill Borrow Material Groups:

	Sieve Size	Percent Passing
Group 1A	6"	100
	3"	70-100
	¾"	50-77
	U.S. No. 4	30-50
	U.S. No. 40	3-15
	U.S. No. 200*	0-5
Group 1B	6"	100
	3"	70-100
	¾"	35-80
	U.S. No. 4	20-55
	U.S. No. 40	3-30
	U.S. No. 200*	0-8
Group 2	6"	100
	3"	70-100
	¾"	50-85
	U.S. No. 4	30-65
	U.S. No. 40	3-30
	U.S. No. 200*	0-12
Group 3	6"	100
	U.S. No. 4	50-100
	U.S. No. 40	20-60
	U.S. No. 200*	0-35
Group 4	6"	100

	¾"	75-100
	U.S. No. 4	50-100
	U.S. No. 40	20-70
	U.S. No. 200*	0-50
Group 5**	6"	100
	U.S. No. 200*	0-6

*The percent passing the number 200 sieve shall be determined based on the fraction of material passing the ¾" sieve.

**Subject to acceptance based on test results as specified below in section 152-1.2B.

The maximum particle size allowed for fill borrow material is 6" in any dimension or ¾ of the allowable lift thickness as specified in 152-2.4, whichever is greater. The final gradation shall be continuously well-graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on an adjacent sieve or vice versa (not applicable for Group 5).

If the amount of fine grained material (passing the No.200) in Group 4 exceeds 15% of the fraction passing the ¾" sieve, all fines shall be nonplastic (PI≤4) according to ASTM D 4318.