Attachment 1 - Item X-299 Concrete Crushing

DESCRIPTION

299-1.1 GENERAL. Furnish all labor, materials, equipment, and processes required for the setting up, operating and removal of a portable crushing plant and associated equipment capable of producing crushed recycled concrete pavement in accordance with this specification. This work will include site restoration at the end of operations.

299-1.2 DESCRIPTION OF WORK. The Material Management Site (MMS) Operator will be responsible for setting up a portable crushing plant and associated equipment on or near the project site adjacent to the existing concrete recyclable materials stockpile(s), at a location as determined by the Owner Authorized Representative (OAR); crushing the concrete to the specified gradation, and leaving properly constructed separate stockpiles of the products for utilization. Only concrete from the Owner's supplied recyclable materials stockpile or material delivered from current Airport projects shall be utilized in crushing operations.

299-1.3 SUBMITTALS.

a. Prior to beginning the work, the MMS Operator shall submit a Work Plan to the OAR for approval. The Work Plan shall include a description of all equipment and processes that will be utilized to crush the concrete to the specified gradations, estimated daily production, expected duration of crushing operations, estimated total quantities of each aggregate gradation, estimated duration of mobilization and demobilization, removal of steel and deleterious materials, set up and calibration of weighing equipment, and stockpile management. No work is to commence until the Work Plan has been approved by the OAR.

b. The MMS Operator shall submit a Dust Control Plan for the methods for accomplishment for the alleviation and prevention of dust nuisance originating from construction operations within the project limits in accordance with Specification 01 52 13 Dust Control. The MMS Operator shall utilize the Owner provide sweeper on the job site and along Valley View Lane at all times.

c. The MMS Operator shall submit a Waste Management Plan and comply with reporting requirements in accordance with Specification 01 74 19 Construction Waste Management and Disposal.

d. Comply with all applicable City, State and Federal governmental regulations regarding crushing operations. The MMS Operator shall obtain all required permits and submit copies to the OAR before starting any pre-processing or crushing operations.

MATERIALS

299-2.1 RECYCLED CONCRETE BASE. Recycled Concrete Base (RCB) shall consist of clean, sound, durable particles and shall be free from coatings of clay silt, organic material, and
other objectional materials. Aggregate shall contain no clay lumps or balls. RCB must meet the following gradation when tested per ASTM C117 and ASTM C136:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percentage by Weight Passing Sieves</th>
<th>OAR to Insert Final “Job Mix” Gradation</th>
<th>“Job Mix” Tolerance Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>4”</td>
<td>100</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>3”</td>
<td>90 - 100</td>
<td>±5</td>
<td></td>
</tr>
<tr>
<td>¾”</td>
<td>30 - 70</td>
<td>±8</td>
<td></td>
</tr>
<tr>
<td>½”</td>
<td>20 - 60</td>
<td>±8</td>
<td></td>
</tr>
<tr>
<td>#4</td>
<td>35 maximum</td>
<td>±8</td>
<td></td>
</tr>
<tr>
<td>#40</td>
<td>20 maximum</td>
<td>±5</td>
<td></td>
</tr>
<tr>
<td>#200</td>
<td>0 - 5.0</td>
<td>±3</td>
<td></td>
</tr>
</tbody>
</table>

The final gradation shall be continuously 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.

The fraction passing the No. 40 sieve shall have a liquid limit no greater than 25 and a plasticity index of not more than four (4) when tested per ASTM D4318. The fine aggregate shall have a minimum sand equivalent value of 35 when tested per ASTM D2419.

The job mix tolerances in the table shall be applied to the job mix gradation to establish a job control gradation band. The full tolerance still will apply if application of the tolerances results in a job control gradation band outside the design range.

Recycled concrete aggregate shall consist of Portland Cement Concrete (PCC) or other concrete containing pozzolanic binder material. The recycled concrete material shall be free of reinforcing steel, expansion material, Poly Vinyl Chloride (PVC) pipes, recycled asphalt pavement, metal, geotextile fabrics and other objectional materials. Asphalt concrete overlays shall be removed from the Portland Cement Concrete (PCC) surface prior to pavement removal and crushing.

299-2.2 Sampling and testing.

a. Aggregate base materials. The MMS Operator shall take samples of the aggregate base in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraphs of this section. This sampling and testing will be the basis for approval of the aggregate base quality requirements.

b. Gradation requirements. The MMS Operator shall take at least two aggregate base samples per day in the presence of the Owner’s Authorized Representative (OAR) to check the final gradation. Sampling shall be per ASTM D75. Material shall meet the requirements of this section. The lot will be consistent with the lot size used for density. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the OAR.

c. Flat and elongated particles. The amount of flat and elongated particles in recycled concrete aggregate shall not exceed 20% for the fraction retained on the 1/2 inch sieve nor 20% for the fraction passing the 1/2 inch sieve when tested per ASTM D4791. A flat particle is one
having a f width to thickness ratio greater than 3; an elongated particle is one having a length to width ratio greater than 3.

d. Percentage wear. The percentage of wear shall not be greater than 45% when tested per ASTM C131. The sodium sulfate soundness test (ASTM C88) requirement is waived for recycled concrete aggregate.

Material shall meet the requirements in paragraph 299-2.2. The lot will be consistent with the lot size used for density. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the OAR.

299-2.2 EXISTING Portland Cement Concrete (PCC) STOCKPILES. The MMS Operator shall satisfy himself as to the nature of the recyclable (metals) materials located as referenced above and provide all required labor, materials, equipment and processes in order to maximize the amount of coarse aggregate concrete product produced so that the production of the recycled concrete based is optimized.

It is the responsibility of the MMS Operator to remove such recyclable (metal) material prior to crushing operations. The MMS Operator shall dispose of the recyclable (metal) unsuitable materials directed by the OAR, at no additional cost to the Owner.

299-3.1 GENERAL. All equipment necessary to mix, transport, place, compact, and finish the recycled concrete aggregate base course shall be furnished by the MMS Operator. The MMS Operator shall provide written certification to the OAR that all equipment meets the requirements for this section. The equipment shall be inspected by the OAR at the job site prior to the start of construction operations.

299-3.2 CRUSHING EQUIPMENT. The MMS Operator shall provide a portable tracked or wheel mounted jaw type crusher with a minimum size of 32 inches by 58 inches, capable of handling larger sized concrete in order to maximize the amount of coarse product produced. The feed particle size should be sufficiently large enough to be capable of maximizing the percentage of 3-inch material The OAR will periodically check the crushing operations and percentages of recycled concrete base gradations produced. A grizzly screen may be required for removals. The OAR will make the final determination of the adequacy of the MMS Operator’s crushing operations.

Crusher and screen(s) to be track or wheel mounted in order to facilitate quick site movement as directed by the OAR. The equipment shall be capable of being portable enough to facilitate movements of short distances on site in order to better access the recyclable materials stockpiles and accommodate operational constraints of an active airport, if so directed by the OAR, without any additional mobilization/demobilization costs to Owner.

A magnetic or other suitable device or method of separating steel from the concrete to be crushed into the aggregate gradation listed shall be used. Hand picking may also be required in order to remove all steel and other metals. The MMS Operator shall take possession of the steel/metals for legal recycling off the airport property at his discretion. No steel/metals are to remain on the airport property.

MMS Operator shall comply with the requirements of Specification 01 74 19 Construction Waste Management and Disposal.
Verification of production for payment purposes will be through the means of a belt scale located on the jaw type crusher discharge belt. The scale shall be initially calibrated by a certified outside agency or calibration service utilizing weights traceable to the National Institute of Standards and Technology (NIST) in the presence of the OAR. Thereafter, the belt scale shall be re-calibrated weekly by the MMS Operator, in the presence of the OAR, to ensure accurate measurement. The scale shall have a digital display and be read daily in the presence of the OAR for verification and be capable of printing weigh tickets for submission to the OAR daily. Handwritten delivery tickets are not permitted.

If directed by the OAR, the MMS Operator shall furnish, set up and calibrate a portable truck scale for OAR’s use in weighing the finished product for the duration of crushing of the recyclable materials stockpiles. The scale shall be calibrated by the certified outside agency or calibration service utilizing weights traceable to the National Institute of Standards and Technology (NIST) in the presence of the OAR at the start of operations. The OAR may request that the portable scale remain for a period of time after crushing operations have ceased. The scale shall have a digital readout display and be capable of printing weigh tickets for submission to the OAR daily. Handwritten delivery tickets are not permitted.

Impact type crushers may be allowed for producing recycled concrete base at the discretion of the OAR. The use of impact type crushers shall be submitted to the OAR for approval prior to use.

CONSTRUCTION METHODS

299-4.1 GENERAL. The MMS Operator will be operating his equipment on and near an operating airport. The MMS Operator shall carry out his operations in a manner that will minimize interference with air traffic, and shall be required to cooperate with the FAA, Airport Operations, the OAR, the Owner, the airlines, surrounding communities and other contractors working in the area. The MMS Operator shall not interfere with any public access along any public street at any time and obtain any necessary permits and submit copies to the OAR. The MMS Operator shall comply with requirements of Specification 01 35 13.13 Special Project Procedure for Airport Facilities.

299-4.2 OPERATIONS. The OAR will periodically check the crushing operations and percentages and quality of products produced. The OAR will make the final determination of the adequacy of the MMS Operator’s operations and the amounts and proportions of products being produced.

The first pass of the jaw type crusher is to be screened over a portable tracked or wheel mounted screen in order to remove deleterious material. Oversized product is to be re-fed through the jaw type crusher. Remove deleterious materials separated in the crushing process. The use of a grizzly screen may be required for this operation. Hand picking may also be required in order to remove deleterious materials such as reinforcing bars, PVC pipes, geotextile fabric, etc.

The MMS Operator is to visually survey the feed stockpiles and modify his processes as required and furnish equipment and labor capable of removing, minimizing or distributing any deleterious materials in a random manner in the finished product. Use of a grizzly screen may be required. The MMS Operator shall maintain stockpiles in order to minimize the incorporation of deleterious material.
The MMS Operator shall properly manage and secure all stockpiles. Sites for stockpiles shall be cleaned of deleterious materials which could contaminate the stockpiles. Separate free-draining stockpiles free of segregation shall be provided for the various products produced. Stockpiles shall be kept separate to prevent intermingling at the base. If partitions are used, they shall be of sufficient heights to prevent intermingling. Maintain haul roads in the vicinity of access to stockpiles. When loading out of stockpiles, the vertical faces shall be limited to reasonable heights to eliminate segregation due to tumbling. Maintain height of stockpiles to prevent segregation and comply with Airport Operations or FAA height restrictions. Segregation or degradation due to improper handling, stockpiling or loading out of stockpiles will be just cause for rejection of the material. The OAR will make the final determination as to the acceptability of each product.

The MMS Operator shall protect any and all existing utilities and facilities to remain on the site. The MMS Operator shall contact coordinate with the appropriate entities as required to locate and mark all utilities in the vicinity of the Work, prior to any activity.

299-4.3 ACCEPTANCE SAMPLING AND TESTING. Samples of recycled concrete aggregate to check gradation shall be taken every 2,500 tons of material produced or a minimum of one test every two weeks; whichever is more frequent. Sampling locations shall be determined on a random basis in accordance with statistical procedures contained in ASTM D3665. Sampling shall be per ASTM D75, and testing shall be per ASTM C136 and ASTM C117.

Crushing operation at the jobsite will be subject to monitoring by the OAR to ensure that the material is clean and meets the requirements. Uniformity in production of clean recycled concrete and uniformity of placement in the field free of segregation are required. Precautions shall be taken to avoid segregation of material in the stockpile or during placement.

END OF Attachment 1 - Item X-299 Concrete Crushing