

Chapter 11

Materials Production Program

11.0 Introduction

Activity Description

This activity includes producing, stockpiling and hauling of aggregates, purchasing and producing asphalt mixes and producing treated anti-skid materials.

Purpose

The purpose of this activity is to provide anti-skid materials, aggregates, and asphalt mix materials for use in the completion of maintenance activities.

Timing of Maintenance

Aggregates are generally purchased through contracts. Anti-skid material requests are justified by the usage for that Section or stockpile. Anti-skid material is requested when approximately one-year supply is remaining at the use location and generally a three (3) to five (5) year supply is targeted. Other aggregate requests are based on specific project quantities and scheduled to meet anticipated project schedules. Asphalt mixes are purchased through project specific contracts or central plant term contracts.

Approvals

Aggregate crushing and mixing material contracts are requested on an annual basis. They are reviewed and approved through Helena headquarters based on need and available funding available.

Documentation

Documentation of these activities should be in accordance with activity reporting as outlined in the Maintenance Management System Manual.

Resources

Maintenance Management System Manual
Reclamation Plans
Purchasing Manual
Purchase Contracts
Standard Specification Manual

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11.1 Aggregate Production and Acquisition (MMS 8408)

Activity Description

This activity includes the producing and stockpiling of aggregates for maintenance activities including chips, hot asphalt plant mix and anti-skid materials. These materials are typically acquired through SMP contracts. If other MDT construction contracts are scheduled to be in the area of need, the quantity and gradation of the aggregate may be included as a bid item. However, some materials may be obtained by screening of aggregates, which are typically accomplished by Department forces.

Purpose

The purpose of this activity is to produce aggregate for use in maintenance operations. This will include the production of anti-skid material for winter operations, aggregate for premix, chips and base course aggregates.

Timing of Maintenance

Material needs should be reviewed at least annually. Contracting for materials production is done annually. Material needs for planned projects should be identified well in advance and requested when the annual crushing contracts are being developed. Anti-skid material needs should be reviewed each spring.

Anti-skid material requests are:

- Justified by the usage of the section or stockpile site.
- Requested when one-year supply remains at the use location.
- Justified by the usage of the section or stockpile site.
- Requested when a one-year supply remains at the use location.
- Requested generally for a three (3) to five (5) year supply.

Specialized Equipment

- Screening Plant
- Dozer
- Loader
- Stacking conveyor (preferred method)

Materials

Acquisition of contract takeover materials, such as anti-skid materials, is at the option of the Department. Any materials, such as anti-skid materials, acquired through contract takeover must meet Department materials specifications or be specifically approved by the Maintenance Division Administrator.

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Testing

All materials purchased must be tested in accordance with contract requirements.

Storage/Stockpiling

Areas used for storage of materials are reviewed to ensure that:

- The stockpile is not placed within the clear zone.
- Trucks and other equipment can access the stockpile in a manner that does not impede the flow of traffic.
- Sight distance is adequate for loaded trucks leaving the area.
- The stockpile will not create a dust hazard for motorists either when the material is produced or when the trucks are being loaded.
- The stockpile should be located to minimize erosion or sedimentation near riparian areas.
- Access to the public is prevented when possible.

When stockpiling, the following should be considered:

- Care should be taken when stockpiling in storage facilities. Materials must not be stacked against non-reinforced walls.
- Stockpiles should be constructed by using stacking conveyors, dozers or loaders whenever possible. Use of trucks to build the stockpile should be a last resort. Extreme caution must be used to eliminate personal injury or equipment damage when stockpiling with trucks.

Safety and Training

Supervisors should review the material production operation with the crew to ensure that

- A circulation pattern of the trucks and other equipment is established to reduce the chance of accidents in the pit area. One-way circulation is the preferred pattern within a pit.
- Appropriate safety clothing and equipment are being used.
- Appropriate traffic control is planned and used for any hauling operations.
- Care is taken in building a stockpile

Special Precautions

Prior to starting work in a material site, the supervisor should ensure that:

- A reclamation plan has been developed and all special permits have been received.
- The limits of the pit are known so the work is not performed outside the pit limits.
- If a MDT-operated screening plant is used, ALL employees are trained about personnel safety equipment, and site requirements of Mine Safety Health Administration (MSHA) must be adhered to. The Mine Safety Administration must be advised prior to set up of any operation, such as screening, that is under their jurisdiction.

- Utility location – “one call” before digging.
- During screening operation, all MSHA requirements are followed.
- Care should be taken when working around stockpiles. Collapsing overhangs, vertical walls and soft shoulders in a stockpile may pose a hazard to employees and equipment.

Environment Best Management Practices

Best management practices include:

- Locating all stockpiles away from rivers and streams.
- Striving to eliminate diesel and solvents as a releasing and cleaning agent using environmentally sensitive agents.
- Carrying adequate erosion control supplies (diapers, kitty litter, shovels, etc.) to keep materials out of water bodies.
- Performing work in dry weather to minimize any runoff of hazardous material.
- Disposing excess materials at sites appropriate for the materials being disposed. If possible MDT will use commercial asphalt plants for asphalt where economically feasible.
- Keeping stockpiles free of debris and weeds.

Procedure

1. Develop a reclamation plan and obtain all required permits.
2. Strip pit as necessary, stockpiling topsoil for use during pit reclamation.
3. Set plant up to provide the shortest haul possible for feeding with loader.
4. Feed plant with loader or crawler tractor.
5. Set up appropriate traffic control for hauling.
6. Haul aggregate to stockpile location or job site.
7. Reclaim area when job is completed as per reclamation plan.
8. Stockpile sites should be monitored for contamination, theft or unauthorized use.

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11.2 Purchase or Production of Premix Asphalt Materials (MMS 8402, 8403, 1301)

Activity Description

Work under this activity includes the purchasing of hot asphalt plant mix or the mixing of liquid asphalt with a specification aggregate to produce asphalt mix material.

Purpose

The purpose of this activity is to provide asphalt mix materials (hot or cold) at locations where it is needed for roadway repairs

Timing of Maintenance

The production or purchase of bituminous mix material should be part of a planned repair activity or project. Hot mix material must be used immediately. Cold mixed materials may be stockpiled for short periods, but should be planned for usage before the end of the season.

Specialized Equipment

- Pug Mill
- Motor Patrol
- Tar Pot

Materials

Materials required for asphalt bituminous mix production includes the following consideration:

- Aggregate size and gradation is selected based on the project.
- Production should be based on the aggregate mix design.
- Liquid asphalt selection is based on the project and mix design.

Ordering

When ordering liquid asphalt materials refer to the Asphalt Term Contract for specific requirements.

Storage

Premix stockpile locations should be reviewed to ensure that

- Stockpile is not placed within the clear zone.
- Trucks and other equipment can access the stockpile in a manner that does not impede the flow of traffic.
- Sight distance is adequate for loaded trucks entering traffic.
- The stockpile is located to minimize erosion or sedimentation near riparian areas.

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Safety and Training

Supervisors should review premix production with the crew to ensure that:

- The flow of trucks and other equipment is set up in a pattern to minimize accidents.
- Safety clothing and equipment is used.
- The MSDS for products to be used is reviewed so that everyone is aware of safety and health precautions.
- Appropriate traffic control for hauling operations is in use.

Special Precautions

- Ensure production is within contract specification and/or mix design.
- Exercise special care when working around hot material and equipment.
- Ensure rocks and dirt do not contaminate the materials when using loaders to load trucks.

Environmental Best Management Practices

Best management practices require the development of a site plan for areas adjacent to or near riparian areas to identify erosion and sediment control needs and to ensure stability of the material.

Maintenance will keep stockpiles free of debris and weeds.

Procedures

Cold Mix

1. If the aggregate contains substantial moisture, dry the aggregate by working it with a motor patrol.
2. Use a pug mill to mix asphalt and aggregate to evenly coat the aggregate. Use of a stockpile specific mix design is recommended.
3. Place in stockpile.

Hot Mix

If a central or mobile hot plant is used to make premix:

1. Send material samples to the Materials Lab for a mix design before beginning production.
2. Ensure contractor has obtained the required air quality permits. Contractor may have to move the plant to a site, which is close to gravel.
3. Schedule prior to set with District/Area Materials Lab to have appropriate testing available to ensure the materials produced conforms to the mix design and contract specifications.
4. Set up plant and calibrates the plant (done by contractor).
5. Haul materials directly to a work site or a stockpile site.

11.3 Treating Anti-skid Aggregates (MMS 8404)

Activity Description

Work covered under this activity includes mixing additives, such as salt, liquid de-icers or other additives to anti-skid aggregate materials.

Purpose

Sanding aggregates are treated for a variety of reasons. Aggregate treatments may be used to lower the freeze point and/or prevent large lumps or chunks from forming, which can damage vehicles if thrown from sanding equipment. Aggregate treatments may be used to enhance the longevity of an anti-skid aggregate application.

Timing of Maintenance

When practical, abrasive materials should be mixed and placed in stockpiles prior to the snow season. Materials should not be mixed if there is excessive moisture.

Materials

- Anti-skid materials
- Salt
- Magnesium chloride based products
- Calcium chloride based products
- De-icing aggregates

Ordering

The Purchasing Bureau, based on anticipated needs identified by each Area, contracts salt, deicers and other materials seasonally.

Storage

Proper location of abrasive stockpiles is critical to an efficient snow removal operation. The location of stockpile sites should

- Maximize productive travel time.
- Be situated to maximize use.
- Be located to minimize environmental impact.
- Do not create a nuisance to adjoining properties.
- Care should be used not to dig too deep, which might contaminate the materials with rocks and dirt.

Treated materials should be stored in storage buildings whenever possible. When buildings are not available, attention should be given to stockpile drainage to prevent chemical treating agents from migrating into watercourses or negatively impacting the environment.

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Safety and Training

Supervisors should review safety and related concerns with all employees responsible for mixing the abrasive mixtures.

Special Precautions

Handling alternative de-icing materials must be in accordance with the manufacturers' recommendation included on the labels and MSDS.

Best Environment Management Practices

Best management practices include

- Prevent anti-skid/de-icer from migrating into watercourses and impacting the environment.
- Store sand and chemical in a manner to minimize the potential for any contamination of surface or ground water.
- Place chemically treated abrasives in covered storage if possible.
- Keep stockpile free of debris and weeds.

Procedures

1. Add solid treatments when materials are crushed.
2. Use pug mills for mixing aggregates and treating materials.
3. Spread the aggregates on a mixing floor if using a blade. Some type of mixing area should be used to prevent the contamination of the aggregate with oversized or unwanted materials.
4. Spread/spray the recommended percentage of treatment materials over aggregates. Apply solid treating chemicals using a sander, dump truck or loader. Liquid materials are applied using spray application equipment. (Recommended ratio of salt to sand is 3% to 5%. Recommended application of liquid is 6-8 gallons per ton).
5. Mix with motor patrol.
6. Stockpile with front-end loader or a stacking conveyor if available.

11.4 Hauling Materials (MMS 8405)

Activity Description

This activity includes hauling aggregates, plant mix or other stockpiled materials from one stockpile location to another. Materials hauled to a specific maintenance activity site are part of the repair activity and coded to the appropriate activity coding.

Purpose

The purpose of this activity is to place maintenance materials at an appropriate, convenient location or to improve access for future use.

Safety and Training

Supervisors should review the hauling operations with all involved employees. Details to stress with the employees include

- Keeping within load limits. (Truck drivers are responsible for operating the truck within legal load limits.)
- Operating equipment at appropriate speeds.
- Routing trucks appropriately.
- Reviewing the loads prior to leaving the loading area to ensure that materials are not built up outside the bed, which could dislodge and fall from the truck.

Environmental Best Management Practices

Best management practices include

- Developing a site plan for areas adjacent to or near riparian areas to identify erosion and sediment control needs and to ensure stability of the material.
- Keep stockpiles free of debris and weeds.

Procedures

1. Load material in trucks, transport and unload at stockpile location or other areas as needed.
2. Stockpile material with a loader or a stacking conveyor if available.

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