General/Scope:

The intent is to perform rail grinding on the SEPTA Broad Street Subway Line as described in the bid documents. The contractor is required to provide all labor, equipment, supervision and technical support to satisfactorily perform production rail grinding. The contractor and contractor’s personnel must be experienced and proficient to satisfactorily shape the rail head and remove grinding defects with the minimum of grinding machine passes as well as metal removal.

The amount of work that can be accomplished during a work period or the production rate is dependent on many factors including condition of the rail head, hardness of the rail, horsepower of grinding motors, grinding speed and the number of grinding stones. The number and size of the grinding motors are considered most indicative of the production capability of the grinding machines.

There will be an onsite pre-bid meeting with all interested bidders. The meeting will include a walking inspection of a few predetermined locations. This will allow the bidders to see the general condition of the rail and special track work that they will encounter.

The project work scope includes grinding 12 miles of track on SEPTA’s Broad Street Subway Express Tracks to be completed at or less than 15 workdays. Work window will be from Sunday to Thursday with an average track outage of 3 hours generally between 1AM and 4AM. Vendor must be able to provide services within 30 calendar days of NTP by SEPTA.

Equipment Requirements:

The contractor’s equipment must meet the following minimum requirements:

1. Standard Railroad gage with third rail electrification. This work will be entirely within a tunnel. The tightest radius on this line that rail grinding equipment must negotiate and grind is 170ft and there is extensive special track work on this system. Special Track work consists of guard curves with tee rail. Flangeways will have a minimum opening of 1 ½”.

2. Grinding Motors: The machine shall have a minimum of eight grinding motors and each grinding motor shall have a minimum horsepower rating of 25hp. All grinding motors shall be movable in such a manner to provide flexible grinding pattern design and maximum motor utilization. To achieve this flexibility the grinding motor positions and power settings shall be computer controlled to permit each grinding motor as much independence as possible from the other motors. Grinding motors shall have a minimum range of adjustment from 60 degrees gage to 20 degrees field. All grinding motors shall have a power up function to insure that all grinding stones are clear of the rail in case of an emergency stop situation.

3. Grinding Motor actuation. The grinding motors shall be controlled in such a manner as to sequence the lowering and rising of the stones to contact the rail at the same point. Grinding motors shall operate independently for each other and a defective motor shall not stop the machine from performing productive grinding. Grinding motors/stones shall automatically rise when the vehicle speed drops below a predetermined minimum to prevent damage to the rail head.
Grinding patterns. Grinding patterns must be fully controllable by a technician and must not be subject to change due to track curvature or superelevation. The grinding patterns shall be designed to achieve the desired rail head profile and defect removal with the minimum number of stone passes and metal removal. It should be noted that different patterns may be required to suit the 115RE, as well as the 100lb rail sections so that excessive metal removal is not required.

Grinding speeds. The machine shall be capable of normal grinding in the range of 2 – 4 mph. Machine shall be capable of grinding in both direction without loss of performance.

Metal removal. The machine shall be capable of removing 3.5 cubic inches of metal per minute per stone.

Surface roughness. Post grind surface roughness shall not exceed 10 microns. Contractor is to verify the removal of corrugation on those areas identified in the rail grinding plan and provide data to SEPTA.

Control Cab. The grinding machine shall be designed to afford optimum visibility when grinding is controlled from cab, including closed circuit television. Control cabs shall have sufficient space and seats for two (2) SEPTA personnel. Other methodology will also be considered.

Track Grade and Curvature. The grinding unit shall have sufficient tractive effort to grind on grades of up to 5%. The grinding unit shall also be capable of grinding each specific Line with regards to gage and curve limitations listed in the “Equipment Requirements” Section.

Travel speed. The grinding unit shall be self-propelled and capable of transiting between storage and work areas at 15 mph on level grades, unless restricted due to distance of site. Grinding unit shall have propulsion and brake control equipment at both ends from which the unit can be operated in transit mode.

Speed indicator. The grinding unit shall have a speed indicator to confirm grinding and transit speeds which can be read at any control station.

Pass-mile odometer. The grinding unit shall be equipped with an accurate pass mile odometer that records daily grinding production. Alternative methods of recording daily grinding production will also be considered.

Unit length. The grinding unit shall be as short as possible to permit efficient use of the equipment.

Smoke and Dust Suppression. The grinding unit must be equipped with a dust collection system which is capable of removing and storing the collected material. The dust collection system must remove sufficient air-borne materials to comply with applicable State and Federal Clean Air restrictions.
15 **Diesel exhaust.** The grinding unit will be operating within tunnels with limited ventilation. The engine exhaust must be clean enough to pose no safety risk to workers in proximity of the grinding unit or working in the area.

16 **Fire and Spark Suppression.** The grinding unit must be equipped with on board fire suppression to extinguish small fires that result from the grinding slag and debris. The grinding wheels, etc. shall be protected by curtains and spark shields that contain the grinding products within the envelope of the grinding unit.

17 **Safety Equipment.** The grinding unit shall have first aid and CPR kits that are easily accessible.

18 **Clearance Requirements.** The equipment must fit within the attached ROW clearance diagram.

**Delivery and Setup:**
1. The contractor will be responsible for the delivery of the grinding unit and adjustments of the machine to work on 56 ½” standard track gage.

2. Contractor is to provide crane service to unload and load the grinding unit on the transport trailer(s). The contractor shall not hold SEPTA accountable for costs associated with delays in loading or unloading the grinding unit which result from the delivery and operation of the cranes. The contractor must provide all slings/lifting spreaders etc that are required to safely lift and lower the grinding unit.

3. SEPTA shall provide diesel fuel for the operation of the grinding unit while performing work on SEPTA Property during the execution of this contract. Equipment will be stored at Fern Rock Yard. Fueling of the equipment will be done at the beginning of shift or after grinding is completed for the night at Fern Rock.

**Pregrind Inspection:**
1. The contractor must perform a pregrind inspection to determine the general condition of the rail prior to the machine’s arrival. The contractor should note whether the rail head is still properly shaped, the amount of wear and the presence and severity of rail corrugation.

2. The contractor shall develop a work plan based on the pregrind inspection which identifies the anticipated number of grinding passes and rail removal required to shape the rail to the desired head radius.

3. The contractor shall submit a line diagram using a track chart for reference that shows the results of the pregrind inspection and the anticipated number of grinding passes for each area with different rail head conditions.

**Execution of Grinding:**
1. The contractor shall expedite all work on the operating tracks. The equipment must always be prepared prior to the outage to work for the full track period available. All necessary equipment maintenance and repair shall be accomplished prior to the work outage.
2. The contractor shall prepare a daily work report which identifies the time the track was available for work, the number of hours of work performed, the number of grinding passes, the location of the grinding passes, the grinding patterns used, any lost time due to equipment breakdowns, and the time work was completed.

**Safety:**
1. The contractor and the contractor’s personnel will be performing work on an active transit line and they must comply with all SEPTA safety rules and practices. All employees must attend SEPTA Track Safety class prior to working on the SEPTA Rail Right of Way. The classes are provided free of charge to the contractor’s personnel however, the contractor is responsible for all other costs associated with your personnel attending the classes.

   2. The contractor must take all reasonable precautions for the safety and protection of all personnel, property, equipment, and bystanders.

   3. The contractor shall identify/designate a responsible member of their organization that will be responsible for the overall safety of the operation. This person shall be the contractor’s supervisor/superintendent unless another is designated in writing by the contractor. This person shall review all of the contractor’s safety precautions as well as special precautions regarding work in the proximity of the grinding unit with SEPTA’s Engineer and QPE.

   4. The third rail will be de-energized for rail grinding operations.

**SEPTA Responsibilities:**
1. SEPTA will furnish a pilot to accompany and direct the movement of the grinding unit while it is on the SEPTA Lines.

   2. SEPTA will furnish fuel for the grinding unit while it is performing work on the SEPTA Lines.

   3. SEPTA shall provide “Fire Protection Personnel” who will patrol and extinguish small fires that are created by the rail grinding operation. The grinding unit must be equipped with a water spray system to try and prevent and extinguish fires which result from the rail grinding. SEPTA will provide water for the spray system.

   4. SEPTA will be responsible for cleanup of excess fillings not captured by the filtration system, provided the Contractors dust collection system is working properly.

   5. SEPTA will provide protection for pedestrians and road traffic, including open deck bridges.

**ATTACHMENTS:**

R.O.W. Clearance Diagrams
SEPTA Track Charts