



# Metro-North Railroad

Attached is the General Procedure for Access to Metro-North Property and Metro-North Railroad's specifications for Individuals and Corporations working on or adjacent to railroad property Sections A and B. Those sections as well as Section C- Insurance Requirements (provided as a separate document) will become part of the final Entry Permit or License Agreement.

**Section A** of the specifications details the requirements for work affecting the railroad. This section contains two drawings SK-1, Sheet Piling Adjacent to tracks as shown in Appendix A and drawing SK-2, Lateral Pressure due to Strip Load as shown in Appendix B.

**Section B** of the specifications details the requirements for erection, demolition and other rigging operations over or adjacent to MNR's right-of-way .

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## GENERAL PROCEDURE FOR ACCESS TO METRO-NORTH PROPERTY

All outside parties who need to perform construction or maintenance on or adjacent to Metro-North Railroad (MNR) property must comply with the following:

### **1. Entry Permit Application and Fee:**

Parties requiring an Entry Permit or License Agreement must complete and submit the Entry Permit Application Form to [entrypermit@mnr.org](mailto:entrypermit@mnr.org), defining the location, scope of work and duration of activities on or adjacent to railroad facilities. Upon submission of the application form, a Permit processing fee of **\$3,000.00** is required. Acceptable form of payments are wire transactions and/or checks.

Please make check payable to "**Metro-North Railroad**" and send to the following address:

Metro-North Railroad  
Capital Program Delivery & Oversight / I&C Dept.  
420 Lexington Avenue, 10<sup>th</sup> Floor  
New York, NY 10170  
Attn: Entry Permit

### **2. Insurance:**

You **MUST** provide proof of insurance coverage for your company, business or municipality as applicable and for Metro-North Railroad as well as the other indemnified parties required in the insurance requirements exactly as described. **Please send the insurance requirements to your insurance broker for review.** Email proof of insurance in a form acceptable to and approved by the MTA Risk and Insurance Management Department (attached separately) and email to [entrypermit@mnr.org](mailto:entrypermit@mnr.org)

Applicant shall obtain confirmation of receipt and approval of the insurance documents from [entrypermit@mnr.org](mailto:entrypermit@mnr.org)

### **3. Railroad Force Account Payment:**

Upon review of the scope and schedule of work provided, MNR will prepare an estimate of the cost of providing Railroad Protective Personnel and all other expenses related to the project. Supply payment, in full, for MNR's estimated cost of Railroad Force Account Services. Obtain confirmation of receipt from [entrypermit@mnr.org](mailto:entrypermit@mnr.org). Since the payment is based on an estimated cost, unexpended funds, if any, will be reimbursed. If the actual work exceeds the estimated cost, additional payment shall be submitted to continue Railroad Force Account Services. Make Check Payable to "**Metro-North Railroad**" and send to the above address.

### **4. Technical Submittals:**

You will need to provide construction shop drawings, calculations and other supporting documentation, as needed, in accordance with the attached "Construction Management I & C Specifications".

Once MNR has received all submittals plus all supporting documents, please allow 15 working days from date of receipt for MNR's review of the submittals. When the above requirements have been satisfied, please contact the Director of Construction Management no less than 15 working days prior to the start of work to schedule a pre-construction meeting. When all is in order, the Construction Management Department will schedule Railroad coordination and support services. (See Sections A and B of "Construction Management I & C Specifications"). Work cannot commence until the applicant receives permission from the designated Railroad Representative to proceed.



# Metro-North Railroad

## CONSTRUCTION MANAGEMENT SPECIFICATIONS FOR INDIVIDUALS & CORPORATIONS (I & C) WORKING ON OR ADJACENT RAILROAD PROPERTY

Section A (Rev.9/22/2025) & B (Rev 2026)

### SECTION A

#### REQUIREMENTS FOR NON-RAILROAD WORK AFFECTING METRO-NORTH

##### **Introduction:**

MNR is a Railroad providing rail access to New York and Connecticut communities into and out of Manhattan. The term "Applicant" used throughout these specifications shall mean the party requesting the Entry Permit or License Agreement, their employees, agents, consultants, contractors, sub-contractors, etc. Non-Railroad construction and maintenance activities cannot be allowed to interfere with railroad operations. Construction activities cannot take place during Railroad operating hours unless allowed by the Field Inspector. There are conditions unique to this operating railroad environment which MNR must consider when approving construction activities. Among these considerations are high voltage third rail and power transmission systems, high speed and silent trains that require long braking distances, buried signal control and communication systems among others. MNR must have absolute cooperation of any Applicant planning construction activities that could interfere with train operations.

The Applicant is the agency or party who has been granted a formal agreement with MNR to install, construct or maintain their own or another party's property or equipment around the railroad. The Applicant is ultimately responsible for assuring that their agents, consultants, contractors and sub-contractors fully comply with the specifications contained herein.

The Applicant shall safeguard the tracks, rolling stock and other equipment and plant of the Railroad from being damaged in any manner and will be held financially responsible for it. They shall not perform any activities around the Railroad until they have executed a formal agreement and complied with MNR requirements.

##### **Fouling:**

An operating track will be considered fouled when, in the sole opinion of MNR, demolition, blasting or construction activity on or adjacent to a track may interfere with the safe movement of trains. At a minimum, that includes all activities within the envelope of 10 feet horizontally from a track centerline and 22 feet 6 inches above top of rail. A crane, derrick or a similar piece of equipment located on MNR right-of-way or on adjacent property shall be considered as fouling the track when the position in which it is working is such that without regard to the manner in which it is intended to carry out the operation, failure or malfunction could cause damage or obstruction to MNR property within the operating area.

Similarly, MNR utilities (power, communications and signal lines) will be considered fouled when, in the sole opinion of MNR, the Applicant's operation could damage or interfere with these utility lines.

### **Track Use:**

MNR will, at its sole discretion, remove tracks from service and de-activate high voltage traction power facilities to permit certain construction activities that can only be performed at times when MNR can schedule this track use. **In general, MNR can de-activate single tracks at night between the hours of 2:30AM and 5:00AM.** Construction activities that require de-activating all tracks of a main line system must be performed on weekend nights at times specified by MNR. Requests for additional “track use” will be evaluated subject to operating and maintenance priorities. Requests to de-activate track(s) and/or high voltage power systems must be received in writing, emailed to [cnorris@mnr.org](mailto:cnorris@mnr.org) and acknowledged by phone to the assigned MNR Inspector no less than 14 days prior to the scheduled activity. MNR will only consider requests for “track time” to facilitate construction activities for which work plans have been submitted and approved by the Construction Management I & C Department.

### **Protective Personnel:**

MNR will furnish flagmen, inspectors, maintenance of way personnel and similar labor (protective personnel) as required by MNR to protect the operation of train traffic during the Applicant’s construction activities. The Applicant must obey the instructions from MNR flagmen or other representatives on the job site promptly. Failure to follow instructions from MNR personnel on the site will lead to withdrawal of MNR’s entry permit or license agreement, thus closing the job site to the Applicant and its employees. MNR will, at its sole discretion, determine the need for and the availability of protective support personnel. Fourteen (14) calendar days prior to the start of any work approved by MNR, the Applicant must request, by e-mail to [cnorris@mnr.org](mailto:cnorris@mnr.org) authorization to begin work and the assignment of protective personnel (flag). Confirmation of availability of flag and authorization to work will be provided by phone by the assigned MNR inspector. If the Applicant makes their request less than 14 days in advance, MNR may be unable to supply protective personnel and/or the costs of the flag may be higher in accordance with existing collective bargaining agreements.

The cost of protective personnel and any additional penalty costs incurred by MNR due to late notification shall be borne by the Applicant. **Requests to cancel construction activities and protective personnel must be received and acknowledged by the assigned MNR inspector no less than 96 hours (4 days) prior to the start of the scheduled construction activity. Any costs incurred by MNR due to late cancellation notice shall be borne by the Applicant.**

MNR will provide protective forces to the extent possible considering operational and maintenance priorities. MNR makes no guarantee that protective personnel will be available to meet the Applicant’s preferred schedule. Further, no such work may actually commence until the assigned MNR representative affirmatively advises the Applicant that the necessary protective forces are stationed and that he may proceed. Applicants must submit to MNR daily work reports that list onsite work hours and identify MNR protective personnel who were provided to support the work activities. .

### **MNR Representative:**

All matters requiring MNR approval or coordination of construction activities shall be directed to the following:

Mr. Christopher Norris  
Tel: 973-803-8837  
[cnorris@mnr.org](mailto:cnorris@mnr.org)

### **Preparation:**

The Applicant shall obtain written approval of design and construction methods from MNR prior to the start of work. The Applicant shall submit detailed plans, appurtenant data and calculations prepared by a Professional Engineer licensed in the state where the work will be performed for any operation on or adjacent to MNR property. A detailed work plan shall be submitted that describes the proposed means and methods of construction including the mobilization and demobilization of required equipment, material and personnel. will evaluate the effect of this work on the operating Railroad. The plan shall locate and identify all utilities

above and below ground at the work site. The Applicant shall make necessary plan revisions, schedule changes, additions, deletions, etc., at his/her own expense. The Applicant shall remove at his/her own expense any pipe, wire or structural facility installed without MNR approval or which deviates from the plan approved by MNR.

The Applicant shall maintain an up-to-date look ahead schedule of work activities and identify on the schedule whether work plans for each activity have been approved by MNR. This will allow MNR to schedule the required track outages and protective personnel.

Under the direction of a MNR representative (engineer, inspector) the Applicant shall – at no cost to MNR – perform pre and post construction surveys of tracks and structures to establish existing horizontal and vertical clearances. Vertical clearance shall be measured from "top of rail". Horizontal clearance shall be measured from the "centerline of track". The elevations shall reference an established survey benchmark that will remain undisturbed throughout the construction. It may be necessary for the Applicant to monitor movements of tracks and structures on a more frequent basis – monthly, weekly or daily as determined by the MNR representative. Copies of the field notes must be delivered to MNR on the date the survey was performed.

The Applicant shall obtain appropriate soil/foundation data prepared by a licensed Professional Engineer. The licensed Professional must perform an analysis and supply recommendations wherever the project requires excavations, shoring, pipe jacking, borings, dewatering and temporary foundation supports, or any other subsurface construction activities.

Under the direction of a MNR representative (engineer, inspector) the Applicant shall – at no cost to MNR – take pre and post construction photographs of the entire work site and track area, photographs must be submitted to MNR and must be labeled. The label shall include project title, Project Identification Number (PIN), Bridge Identification Number (BIN) or contract number, name of Applicant, date and direction photograph was taken. Each photograph shall also be numbered for identification.

### **Submittals**

All submittals requiring review and approval by MNR shall first be reviewed by the Applicant's designated Consulting Engineer and then submitted to MNR to complete the review and approval process. Submittals shall be stamped or written as "Approved", "Approved as Noted", "Revise and Resubmit", or "Rejected" by the Applicant's designated consulting engineer at the conclusion of the review prior to its submission to MNR.

### **Environmental Controls:**

The Applicant shall comply with all Federal, State and Local laws, regulations and rules governing environmentally controlled substances and construction practices. He shall submit a plan and procedure prepared by a Professional Engineer licensed in the state where the work will be performed for handling and disposal of regulated materials. De-watering operations shall comply with applicable regulatory controls and shall be subject to MNR review and approval. The Applicant shall comply with Federal and State regulations for containment, storage and disposal of hazardous/industrial wastes. He shall comply with MNR Procedure 50-601, Item "O", Environmental Controls. The Applicant shall indemnify and hold harmless MNR from any loss, liability or expense on account of claims which result from the handling, transportation, disposal or abatement of asbestos, asbestos-containing material or asbestos-contaminated materials, lead paint materials, polychlorinated biphenyls (PCB's) and other environmentally regulated substances and materials in the possession of Applicant or their subcontractors.

### **Drainage/Wetlands/Storm Water Protection:**

MNR is a non-traditional Municipal Separate Storm Sewer System (MS4). The Applicant must submit a Storm Water Pollution Prevention Plan (SWP3) for their project if it will result in the disturbance of surface areas and/or the creation of new impervious surfaces. The SWP3 must include temporary sedimentation and erosion control measures (both a narrative description of the measures and a site diagram), as well as appropriate post-construction storm water protection measures (narrative description and design drawing) if

the project will result in any new impervious area. The Applicant will be responsible for inspection and maintenance of sedimentation and erosion control measures during construction, and responsible for payment to MNR for any ongoing maintenance required for post-construction storm water protection measures.

The Applicant will be responsible for identifying and delineating any and all wetlands in the area covered by the Entry Permit and/or in any area which could be impacted by the Applicant's project. The Applicant will be responsible for obtaining any permits required solely in their name as permittee. The Applicant shall promptly provide MNR with copies of all identification/delineation documents and reports as well as permit applications and permits in both draft and final form.

The Applicant shall indemnify and hold harmless MNR from any loss, liability or expense on account of claims that result from a failure to implement or maintain adequate storm water protection measures or a failure to obtain or comply with necessary regulatory permits.

Contractors must protect ballast and keep free from soil, concrete, slurry and other contaminants.

Contractors must supply a method for the protection of the ballast. The Contractor/Applicant is financially responsible for the replacement of contaminated ballast. The replacement of the ballast is performed by MNR's Track & Structures Department.

#### **Security:**

The Applicant shall adhere to MNR security practices. He shall identify all Applicant/subcontractor personnel who have reason to enter a designated security area of MNR property. He shall supply a listing of the names of all personnel who have reason to enter MNR property. The list shall be updated on a daily basis.

When working in Grand Central Terminal (GCT) the Applicant shall submit a list of all the personnel working at the site to the Stations Master's Office (SMO) at the beginning of the shift. The list must include work location, date and work period. At the end of every work shift the competent person on site must notify the SMO that work has ended, and everyone has left the work site.

#### **Safety:**

Upon being awarded an Entry Permit, all sponsor personnel who enter upon or works adjacent to Metro-North's property are required to complete the computer-based training class entitled 'Roadway Worker Procedures for Contract Employees'. It is the Sponsor's responsibility to schedule training and ensure workers complete the computer-based training (CBT) prior to the start of work. Sponsor personnel will not be permitted to commence work until they present documentation demonstrating each worker has completed the training. CBT cost will be at the Sponsor's expense at an approximate cost of \$21.00 per person [this fee is not paid to MNR and is subject to change without notice]. Sponsor personnel who fail to carry proof of training shall be removed from the property.

The sponsor shall comply with the requirements of all applicable Federal, State, Local and Metro-North jurisdictions to provide a suitable work environment for workmen and for the general public. Sponsor shall prepare and submit a comprehensive Safety Plan which will: Designate a company Representative(s) who will prepare and implement a program of compliance. The Sponsor must supply company emergency contact information; personal protective equipment for all workmen employed by the sponsor or his contractors and enforces use of this equipment by contract personnel.

The sponsor shall supply Safety Data Sheets (SDS) for construction or maintenance materials that pose safety, fire, health or other hazard to Metro-North.

#### **Protective Enclosures:**

The Applicant will not store materials or equipment upon the Railroad right-of-way without first obtaining

written permission and approval of MNR. The Applicant shall secure construction materials and equipment that could be used by vandals to obstruct Railroad operations in a vandal-proof enclosure. The Applicant shall be responsible to protect the work site with fences, barricades, barriers, watchmen or other means necessary to bar access to operating areas via the work site. Fences at a minimum shall be 12-gauge chain link, eight (8) feet in height. Vehicular barriers shall comply with "AASHTO" Standard for design and fastening to structures.

**English Language:**

The Applicant must furnish an English-speaking supervisor at each job location who is capable of communicating (including translating if necessary) instructions from the flagman or other MNR representative to the Applicant's personnel on the job. Such supervisor must remain on the site at all times while work is being performed or any Applicant employees are on or about the MNR right-of-way.

**Blasting:**

Is prohibited on MNR's property. MNR shall determine if any blasting in the vicinity of the railroad will affect its operations. The Applicant shall submit to MNR for approval, plans and specifications of any proposed controlled blasting activities that could affect railroad operations.

**Hi-Rail Equipment:**

Highway-rail mounted equipment must be in first class conditions to prevent delays to the trains. Contractors must have written permission before placing or putting into service equipment on or near the tracks. Inspection must be performed by the railroad not less than every 3 months. It is the contractor's responsibility to coordinate all inspections of equipment prior to use on the right-of-way.

Prior to daily operation of rail mounted equipment, the equipment operator is responsible to conduct daily safety and equipment inspection of the vehicle. Inspection shall be documented on the provided "Contractor Daily Hi-Rail Vehicle Inspection" form.

All equipment operators shall be trained in the operation of the vehicle and the vehicle's rail gear. The contractor shall submit the qualified operator's credentials including Commercial Driver's License and documented training in use of each piece of rail-mounted equipment. At a minimum, this training to be provided by "in-house mechanic" for owned equipment or equipment rental vendor for rented equipment.

**Temporary Structures:**

Shall be necessary at the sole discretion of MNR to protect the Railroad or the general public from possible falling debris, paint or other materials, to protect personnel working above the right-of-way, to provide a platform for personnel, materials, and/or equipment and to provide a walkway for the general public.

Temporary structures intended as walkways for the general public shall comply with the "New York State Building Code" and the Americans with Disabilities Act of 2010.

Temporary Stairways or pedestrian walkways must be fully enclosed to protect from precipitation.

A protective scaffold intended to contain finely broken concrete decking shall be designed for a live load of 200 lbs. per square foot applied uniformly over the entire structure, and a 2-kip concentrated load placed anywhere on the structure. The two loads are not to be applied simultaneously for design purposes. Design of the scaffold intended for any other purpose shall be submitted to MNR for approval. The design shall contain details of any construction activities supported or protected by the scaffold. Impact loads or rigging that exceed the capacity of the scaffold shall be subject to the conditions of Section B "Rigging". Wood for protective scaffolding must be fire-retardant. The Applicant must supply MNR with certification from the manufacturer or supplier that lumber meets or exceeds the ASTM E-84 fire-retardant specification for exterior application 30-minute duration. Plans and calculations for temporary structures must be submitted to MNR for review and approval prior to construction. Further, plans and calculations must be prepared and stamped by a Professional Engineer licensed in the State of New York. All temporary structures, including shielding, decking and walls, shall be secured to prevent movement and opening of joints both from construction operations and from train movements. Methods of securing shall be indicated on plans.

## **Shoring:**

All drawings for temporary sheeting and shoring shall be prepared and stamped by a Registered Professional Engineer (licensed in the state in which the project is located) and shall be accompanied by complete design computations with supporting soil and groundwater information when submitted for approval.

Sheeting shall be required on all excavations where the side of the excavation is intercepted by the Railroad live load influence line. The live load influence line is defined as a line originating at the top of tie and extending out in this plane a distance of 10 feet, then downward at a slope of 1 (vertical) on 1½ (horizontal). Such excavations must be designed to withstand, in addition to all static loads such as structural dead load, soil pressure and hydrostatic pressure, a Railroad live load of Cooper E-80 as defined in the "AREMA Manual Section 1-3" or other loading magnitude as may be directed by MNR. (See drawing "SK - 1", APPENDIX A).

Interlocking steel sheet piling, driven prior to excavation, must be used to protect track stability. The use of trench boxes or similar devices is not acceptable in this area. No cantilever shoring will be permitted. Soldier piling and lagging will be considered for supporting adjacent track(s) only when its use is approved by MNR. Consideration for use of soldier piling and lagging will be made if the required penetration of steel sheet piling cannot be obtained and when dry, non-running, stable material will be encountered.

Prior to any excavation, drilling, driving or other subsurface work on MNR property, a mark-out of MNR utilities must be requested. Current version of "Protection of Underground Metro-North Railroad Facilities" will be provided, and all procedures therein must be followed. Local requirements for contacting 'Call before you Dig' or 'One Call Center' must also be followed.

Lateral forces acting on the sheeting shall be computed as follows:

The active earth pressure due to the weight of the soil shall be computed by the Rankine Theory.

The Boussinesq analysis shall be used to determine the lateral pressure caused by the railroad loading. The load on the track shall be taken as a strip load with a width equal to the length of the ties (8' - 6"). The vertical surcharge, q (psf), caused by each axle weight divided by the tie length and the axle spacing (5' - 0"). For an E-80 loading:

$$q = 80,000 \text{ lbs.} / (8.5' \times 5') = 1882 \text{ psf.}$$

The horizontal pressure due to the live load surcharge at any point on the sheet piling wall is Ph and can be calculated by the following:

$$P_h = (2q / \pi) (\beta - \sin \beta \cos 2\alpha)$$

(See drawing "SK - 2", APPENDIX B).

The allowable stresses for the sheet piling and other steel members (wales, struts, etc.) shall be in accordance with AREMA Chapter 15, Parts 1 and 2. These allowable stresses may be increased ten percent (10%) due to the temporary nature of the installations.

Where soil or rock anchors are used, all anchors must be tested. Testing shall be in accordance with industry standards with ten percent (10%) of the anchors "Performance Tested" and all others "Proof tested".

Cavities adjacent to the sheet piling, created by the driving of the sheet piling, shall be filled with 1½-inch stone ballast. Any disturbed ballast must be restored and tamped immediately. This task is performed by MNR's Track & Structures department the cost of which is borne by the Applicant.

Sheet piling shall be cut off at the top of tie during construction. After construction and backfilling has been completed, piling shall be cut off thirty-six (36) inches below the bottom of tie and left in place.

Moreover, sheeting alongside active track systems shall maintain lateral support. Lateral support shall maintain a compacted stone ballast shoulder level with the top of tie for at least two (2) feet from the end of tie supported by a slope no steeper than one (1) vertical to two (2) horizontal. Any excavation adjacent to

track shall be covered and ramped and provided with barricades as required by MNR. A lighted walkway with a handrail must be provided adjacent to the track for any excavation within twenty (20) feet of the centerline.

Under the direction of a MNR representative (Engineer or Inspector) the Applicant shall – at no cost to the railroad- perform pre and post construction surveys of tracks and structures to establish existing horizontal and vertical clearances. Vertical clearances shall be measured from Top of Rail. Horizontal clearances shall be measured from the Center Line of Track. The elevations shall reference an established benchmark that will remain undisturbed throughout the construction. It may be necessary for the Applicant to monitor movements of tracks and structures on a more frequent basis – daily or weekly, monthly or as determined by the MNR Representative. Copies of the filed notes must be delivered to MNR on the date the survey was performed.

Final backfilling of the excavation shall be as required by MNR

## SECTION B

### REQUIREMENT FOR ERECTION, DEMOLITION, AND OTHER RIGGING OPERATIONS OVER OR ADJACENT TO METRO-NORTH RIGHT-OF-WAY

The Applicant must furnish scaled plans with supporting calculations in order to obtain written approval prior to the start of any rigging operation over or adjacent to the MNR right-of-way. Submittals for bridge erection, demolition, or other hoisting operations shall be prepared and stamped by a Registered Professional Engineer licensed in the state where the work will be performed and must include the following:

1. Plan view showing locations of crane(s), operating radii, with delivery and disposal locations.
2. Crane rating sheets showing cranes to be adequate for 150% of the lift. Indicate Crane and boom nomenclature.
3. Plans and computations showing weight of picks. Include catalog with weight of equipment to be lifted and manufacturer’s shipping weights.
4. Show in a table format on the plan a “Crane Lifting Schedule” of each crane pick as shown below:

CRANE LIFTING SCHEDULE								
Piece No.	Piece Weight kips	Rigging Weight kips	Block Weight kips	Maximum Weight kips	Maximum Radius feet	Boom Length feet	Crane Capacity kips	Safety Factor 150 %
1	X	X	X	X	Y	Y	X	Z

5. Computations and plans demonstrating that MNR’s train shed structure can bear load of crane with equipment load.
6. Computations and plans demonstrating that soil or foundations for equipment and temporary structures are adequate and able to protect subsurface utilities and structures.
7. Check condition of steel in trainshed (Grand Central Terminal) to ascertain whether steel needs to be

blocked or posted.

8. Plans and calculations showing locations and structural adequacy of mats, barges, embankments, supporting structures, planking, or special decking as required by MNR.
9. Location profiles indicating the proposed swing in relation to obstructions such as overhead wires and structures.
10. Data sheet listing type and size of slings or other connecting equipment. Include copies of catalog cuts or information sheets of specialized equipment. The method of attachment must be detailed on the erection plan. All lifting components must be adequate for 150% of the manufacturer's crane capacity chart
11. A complete procedure indicating the order of lifts and any repositioning or re-hitching of the crane or cranes.
12. Plans detailing temporary support of any components or intermediate stages.
13. A time schedule (by hour and day) of the various stages, as well as a schedule for the entire lifting procedure.
14. Written statement from crane owner of last crane safety inspection with a copy of current inspection certificate and operator credentials.
15. Mark the exact location of the crane in the field at least two working days prior to the intended operation. Also, certify the stability of the foundation for crane outriggers and supports. will be sent to you.
16. Conduct survey/mark out of streets or yards (North of 97th street) to determine whether manholes or duct banks can bear outrigger loads.
17. Computations analyzing the stability of the load during lifting. A minimum factor of safety of 1.5 is to be maintained throughout all stages of the lift.
18. Plans and computations are to be included for any assist or helper cranes or similar equipment involved in mobilization, demobilization, or the rigging operations.
19. Spotters for all equipment are to always be in direct communication with operators.

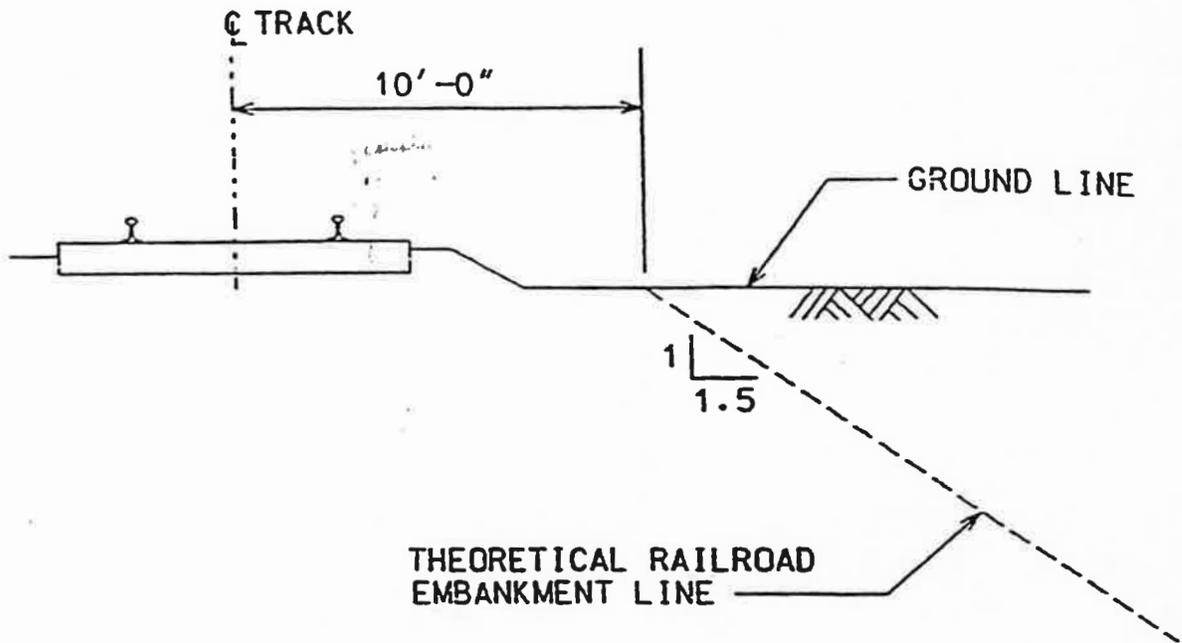
In general, unless otherwise directed by MNR, operations directly over or adjacent to the operating right-of-way which foul the operating area, or which in the event of a failure could fall across the operating area will be performed between approximately 2:30 AM and 5:00 AM.

Operations involving a track and power outage across all tracks may be performed at times specified by MNR.

Any deviation from this plan must be reviewed and approved by the Applicant's engineer prior to resubmission to the MNR Engineer for review and approval prior to the date that the work will be scheduled.

DWG. SK - 1

(2/18/00)



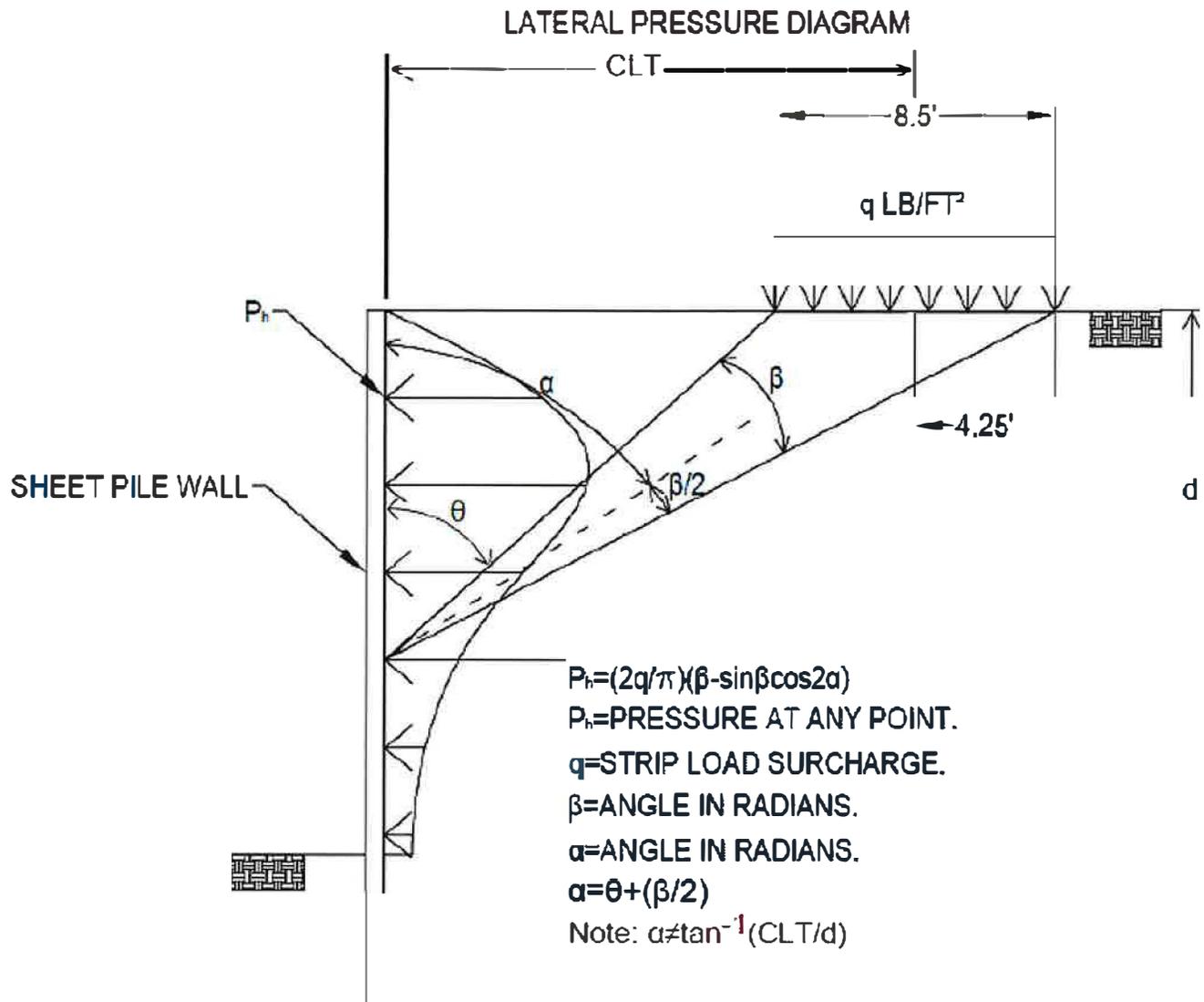
REQUIREMENTS FOR TEMPORARY SHEET PILING ADJACENT TO TRACK

1. STEEL SHEET PILING FOR TRACK SUPPORT IS NOT REQUIRED FOR EXCAVATION OUTSIDE THE THEORETICAL RAILROAD EMBANKMENT LINE. SHORING IN ACCORDANCE WITH OSHA REQUIREMENTS SHALL BE USED IN THIS AREA.
2. STEEL SHEET PILING, DRIVEN PRIOR TO EXCAVATION, IS REQUIRED WHEN EXCAVATION IS WITHIN THE THEORETICAL RAILROAD EMBANKMENT LINE.
3. ALL SHEET PILING IS TO BE DESIGNED FOR AN E-80 LOADING. THE BOUSSINESQ ANALYSIS IS TO BE USED TO DETERMINE THE LATERAL PRESSURE CAUSED BY THE RAILROAD LOADING.

# APPENDIX B

DWG. SK. 2

(1/4/16)



LATERAL PRESSURE DUE TO STRIP LOAD