

NOVEMBER 3, 2023



Engineering Department

# GUIDELINES FOR UTILITY INSTALLATIONS

WIRELINES, PIPELINES, TRACK MONITORING AND TEMPORARY SHORING

For additional information go to [https://metra.com/real-estate-leasing#General\\_Leasing\\_Information](https://metra.com/real-estate-leasing#General_Leasing_Information)

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# Part 1 - Wirelines and Communications Cables

## *General Requirements*

This section applies to all public and private utilities, including electric power, telephone, fiber optics, telegraph, cable television, and other communication and data transmission facilities, both overhead and underground.

Installations crossing Metra property shall be, to the extent feasible, perpendicular to the right of way. Utilities shall not be placed within culverts or under railroad bridges, buildings, or other structures.

Wirelines and cables shall be located to provide a safe environment and shall conform to the current *National Electric Safety Code* and the *American Railway Engineering and Maintenance Association Guidelines*. Where local laws or authorities prescribe a more stringent specification, that specification shall supersede the specification in this manual.

Metra may request that an Inductive Interference study be performed, at the expense of the utility owner, for the proposed crossing. Inductive interference has the potential to disrupt railroad signal systems causing failures in track signals and grade crossing warning devices and safety concerns for people working on or near the tracks. Metra's Chief Engineer will determine the need for such a study on a case-by-case basis.

All wire line applications shall include a plan and cross section view, at a clear and legible scale, of the proposed installation.

Plan views shall include the following:

- Date of plan, scale, and north arrow
- Centerline of all railroad tracks
- Distance (in feet) to nearest railroad milepost or grade crossing (centerline of road)
- Right of way dimensions
- Angle of crossing relative to right of way
- Location of all railroad signal facilities and pole lines
- Location of all existing utility pole lines and above ground utilities
- Location of all existing underground utility markers
- Location of proposed poles or handholes and distance from centerline of nearest track to edge of pole or handhole
- Length of wire line span above or under tracks

Cross section views shall include the following:

- Date of plan, scale
- All railroad tracks
- Right of way dimensions
- Vertical clearance from bottom of sag to top of rail on all tracks or depth of burial
- Location of poles and distance from centerline of nearest track to edge of pole
- Length of span across tracks from pole to pole or handhole to handhole
- Location of all existing railroad pole lines and utility lines
- Location of all grade crossing signal equipment (gates, flashers, masts, cantilevers, etc.) if located near or within a road crossing

## **Specifications for Overhead Electrical Wireline Crossings**

These specifications shall apply to overhead electric power line crossings over railroad rights of way, tracks, and signal and communication wires.

The Crossing Company shall submit plans showing proposed construction for review and approval with its application. A signed easement agreement, formal approval of plans, and subsequent contractor right of entry (see right of entry application) is required prior to commencement of construction.

1. Spans crossing the right of way shall preferably have the supporting poles located outside the right of way. The crossing span, where practicable, shall not exceed 175 feet. Where practicable, the adjacent spans shall not exceed the length of the crossing span by more than 50%. Where practicable, the poles supporting the crossing span and the adjacent spans shall be in a straight line.
2. Pole lines paralleling the right of way shall have the poles located not less than 15 feet from the nearest rail, with a minimum distance of 8.5 feet from the nearest rail to any cross arm, guy, or other attachment. When necessary to provide safe operating conditions which require unobscured view along the track for signal, signs, etc., Metra may require clearances greater than those specified above.
3. Wood poles shall be new and structurally sound. If guys are omitted, poles shall be located a minimum distance from the centerline of any track equal to the height of the pole above the ground line plus 10 feet. Gains shall not be cut to a depth of more than one-half inch. Spliced poles shall not be used in the crossing span.
4. Poles supporting the crossing span shall be guyed in both directions, if practicable, and shall be head guyed away from the crossing span when the crossing span places undue stress on the crossing poles. Guys shall be of galvanized steel or stainless steel **and shall have high visibility guarding.**
5. Suspension strands shall be of galvanized steel or other material that will not corrode excessively under the prevailing conditions.
6. The construction shall be subject to the inspection of Metra and shall comply with the requirements of these specifications. Defective material shall be rejected and replaced with acceptable material.
7. The crossing shall be maintained in a safe condition. The poles, crossarms, guys, wires, and other parts and materials used in the structure of the crossing shall be periodically inspected, and all defects shall be promptly repaired by the owner of the line. The guys and anchors shall be maintained so that the guys are kept taut and serve the purpose for which they are intended. The line wires shall be kept to the proper sag. Underbrush, grass, or other combustible material shall be kept removed, by the wireline owner, from the poles for a sufficient distance to reduce fire hazard to a minimum.

8. Where the wires or cables of the crossing span are supported on both crossing supports by pin type insulators, or by suspension type insulators in a suspended position or in a strain position, the vertical clearance between the wires or cables of the crossing span and the top of rail, at 60° Fahrenheit and no wind, shall conform to the following clearance table:

<b>VOLTAGE (to ground)</b>	<b>MINIMUM CLEARANCE REQUIRED ABOVE TOP OF RAIL</b>
Shielded or insulated power wirelines 0-750 volts	24 ft.
Shielded or insulated power wirelines (Lashed to bare ground messenger) 751V to 22kV	24.5 ft.
Open supply conductors 0-750 volts	24.5 ft.
Open supply conductors 751V – 22kV	26.5 ft.
50kV	27.5 ft.
100kV	29.2 ft.
150kV	30.8 ft.
200kV	32.5 ft.

- a. Where the distance from the nearer crossing support to the point where the line crosses over the farthest rail is more than 75 feet, the clearance of (a) above shall be increased by 0.2 feet for each 10 feet in excess of 75 feet in length.
- b. For the protection of railroad crane and pile driver operations, and the protection of the wire line crossing, it is preferred that any wire or cable crossing be located at least 1,000 feet from any railroad bridge, trestle or large culvert. When it is necessary to locate less than 1,000 feet from such a structure, the vertical clearance shall not be less than 50 feet.
10. The clearance between any two wires crossing each other and carried on different supports shall be not less than the following:

- Where the upper conductor or wire has fixed supports, the sum of the distances from the point of intersection of the two crossing wires to the nearer supporting structure of each span does not exceed 100 feet:

NATURE OF WIRES CROSSED OVER	Communication	Supply cables having permanently grounded metal sheath – all voltage		Open supply wires:		Guys, Messengers, span wires, lightning protection wires, service drops 0 - 750 volts
		Line Wires	Service Drops	0 – 8,700 volts	8,700 – 50,000 volts	
	Feet	Feet	Feet	Feet	Feet	Feet
Communication	2	4	2	4	6	2
Supply cables having permanently grounded metal sheath – all voltage	4	2	2	4	4	2
Open supply wires:						
0 - 750 volts	4	2	2	2	4	2
750 – 8,700 volts	4	2	4	2	4	4
8,700 – 50,000 volts	6	4	6	4	4	6
Guys, Messengers, span wires, lightning protection wires, service drops 0 - 750 volts	2	2	2	4	4	2

**Note:** for voltage exceeding 50,000, the clearances given above shall be increased at the rate of 0.4 inches for each 1,000 volts in excess of 50,000.

- Where the upper conductor or wire has fixed supports, and the sum of the distances from the point of intersection of the two crossing wires to the nearer supporting structure of each span exceeds 100 feet, the clearances listed in the above table shall be increased by 0.10 feet for each 10 feet in excess of the 100 feet.
11. Conductors supported by suspension type insulators at crossings over communication wires shall be increased by such an amount that the values specified in the above table will be maintained in the event of a broken conductor in either adjacent span, provided such conductor is supported as follows:
- At one support by suspension type insulators in a suspended position, and at the other support by insulators not free to swing (including semi-strain type insulator).
  - At one support by a strain insulator, and at the other support by a semi-strain type insulator.
  - Splices shall not be made in the crossing span, and preferably not in the adjacent spans, which are depended upon for withstanding the longitudinal tension of the crossing conductors. Taps shall not be made in the crossing span. If a splice or tap is made in any conductor in the span adjacent to the crossing span, it shall, where practicable, be

placed at a point nearer to the crossover support than is the nearest conductor crossed over.

- d. Cradles, baskets, and overhead bridges are generally not acceptable and shall not be used except under unusual conditions where it is economical to build such a structure of sufficiently substantial nature and when approved by Metra. Dropouts shall not be used.
- e. The crossing construction shall always be subject to the inspection and approval of Metra.
- f. All parts of the supporting structures of the crossing span shall be inspected annually by the owner and all defective parts shall be promptly restored to a safe condition.
- g. The details of construction and maintenance of the crossing, unless otherwise specified herein, shall be in accordance with the current specifications of the National Electrical Safety Code, except when modified construction is permitted by Metra.



## Specifications for Overhead Communication Line Crossings

These specifications shall apply to the construction of overhead communication lines crossing or paralleling the right of way. Wires covered by these specifications shall not carry more than 400 volts.

1. Spans crossing the right of way shall preferably have the supporting poles located outside the right of way. The crossing span, where practicable, shall not exceed 175 feet. Where practicable, the adjacent spans shall not exceed the length of the crossing span by more than 50%. Where practicable, the poles supporting the crossing span and the adjacent spans shall be in a straight line.
2. Pole lines paralleling the right of way shall have the poles located not less than 15 feet from the nearest rail, with a minimum distance of 8.5 feet from the nearest rail to any cross arm, guy, or other attachment. When necessary to provide safe operating conditions which require unobscured view along the track for signal, signs, etc., Metra may require clearances greater than those specified above.
3. Wood poles shall be new and structurally sound. If guys are omitted, poles shall be located a minimum distance from the centerline of any track equal to the height of the pole above the ground line plus 10 feet. Gains shall not be cut to a depth of more than one-half inch. Spliced poles shall not be used in the crossing span.
4. Poles supporting the crossing span shall be guyed in both directions, if practicable, and shall be head guyed away from the crossing span when the crossing span places undue stress on the crossing poles. Guys shall be of galvanized steel or stainless steel **and shall have high visibility guarding.**
5. Suspension strands shall be of galvanized steel or other material that will not corrode excessively under the prevailing conditions.
6. The construction shall be subject to the inspection of Metra and shall comply with the requirements of these specifications. Defective material shall be rejected and replaced with acceptable material.
7. The crossing shall be maintained in a safe condition. The poles, crossarms, guys, wires, and other parts and materials used in the structure of the crossing shall be periodically inspected, and all defects shall be promptly repaired by the owner of the line. The guys and anchors shall be maintained so that the guys are kept taut and serve the purpose for which they are intended. The line wires shall be kept to the proper sag. Underbrush, grass, or other combustible material shall be kept removed, by the crossing owner, from the poles for a sufficient distance to reduce fire hazard to a minimum.
8. Where the wires or cables of the crossing span are supported on both crossing supports by pin type insulators, or by suspension type insulators in a suspended position or in a strain position, the vertical clearance between the wires or cables of the crossing span and the top of rail, at 60° Fahrenheit and no wind, shall conform to the following clearance table:

## Wire Line Clearance Chart

<b>VOLTAGE (to ground)</b>	<b>MINIMUM CLEARANCE REQUIRED ABOVE TOP OF RAIL</b>
Insulated Communication Wirelines	23.5 ft.
Non-insulated Communication Wirelines	24 ft.

## **Specifications for Underground Wirelines (Electrical and Communications)**

Wirelines located within the right of way must be located as far as possible from existing tracks and other railroad facilities. All installations shall be designed and constructed so the railroad operations and facilities are not interfered with. Additionally, the proposed installation shall be located to minimize encumbrance to the right of way in order that Metra will have unrestricted use of the property for current and future operations.

1. Wirelines shall be located to cross tracks at approximately right angles where conditions permit.
2. Electrical and Communication wirelines are not permitted to be installed in a common duct bank
3. A Metra signal department employee must locate any buried signal cables prior to construction.
4. The tops of ducts and cable systems structures of underground cable crossings shall be located at a depth of not less than 5 feet - 6 inches below base of rail and not less than 36 inches below bottoms of ditches or 48 inches below natural ground, with the lowest depth governing. Deeper installations may be required to avoid conflict with underground railroad facilities.
5. Underground crossings of power supply cables with maximum voltage of 750 volts and communication cables of low voltage may be installed by pushing a galvanized steel pipe under the tracks at a depth specified above to serve as a conduit, provided such pipe extends the full width of the right of way. All ducts and/or encasements beneath the tracks must be capable of withstanding E-80 loading and conform to AREMA Specifications. **Any conduits and/or encasements larger than four inches will be governed entirely by those specifications which normally cover pipelines (see "Specifications for Pipelines).** Jacking or boring installation is preferred, and no water is to be used in the installation of the encasement.
6. Underground crossings of communications cables may be installed by directional boring of a suitable flexible conduit a maximum of 6 inches in diameter at a minimum distance of 15 feet below the base of rail.
7. Underground crossings of power supply cables operating above 750 volts will be installed at depths specified above and in addition, between the points where the underground crossing enters and leaves Metra property, the cable is to be enclosed in galvanized steel pipe or approved concrete encased duct for mechanical protection of the cable. No unprotected cable of this potential will be permitted.
8. All underground installations must be located a minimum of 50 feet from the end of any railroad bridge, centerline of any culvert or turnout (switch) area to the centerline of the wire line crossing.

9. If the proposed location of the wire line crosses existing culverts, the top of the buried wire line must be installed a minimum of 5' below the culvert invert. If the location crosses a ditch beyond the end of the culvert (field side) then the top of the buried encroachment must be installed 5' below the bottom elevation of the ditch.
10. Manholes must be capable of withstanding H-20 highway loading requirements and must be installed so as not to create a stumbling hazard.
11. In addition to the requirements of these specifications, the underground crossing is to conform to the requirements of the National Electrical Safety Code, current edition. The crossing is also to conform to the requirements of any local or state laws or regulations of any local code enforcing authority that may be in effect at the time of the installation.
12. All underground installations carrying power or communication wires and cables shall be constructed and properly marked with signs bearing the name of the owner and 24 hour emergency contact information.

## Part 2 – Pipelines: Flammable and Non-Flammable Materials (Including Casings Containing Wires and Cables)

### *General Requirements*

This section applies to all public and private utilities, including water, sewer, liquid petroleum products, and gases.

Installations crossing Metra property shall be, to the extent feasible, perpendicular to the right of way. Utilities shall not be placed within culverts or under railroad bridges, buildings, or other structures.

Pipelines shall be located so as to provide a safe environment and shall conform to the current *American Railway Engineering and Maintenance Association Guidelines*. Where local laws or authorities prescribe a more stringent specification, that specification shall supersede the specification in this manual.

All pipeline applications shall include a plan and cross section view, at a clear and legible scale, of the proposed installation. Plan views shall include the following:

- Date of plan, scale, and north arrow
- All railroad tracks
- Distance (in feet) to nearest railroad milepost or grade crossing (centerline of road)
- Right of way dimensions
- Angle of crossing relative to right of way
- Location of all railroad signal facilities and pole lines
- Location of all existing utility pole lines and above ground utilities
- Location of proposed pipeline crossing
- Length of pipeline crossing under tracks
- Location of bridges or culverts

Cross section views shall include the following:

- Date of plan, scale
- All railroad tracks
- Right of way dimensions
- Vertical clearance from bottom of rail to top of pipe on all tracks
- Length of crossing across tracks
- Location of all existing railroad pole lines and utility lines
- Location of all grade crossing signal equipment (gates, flashers, masts, cantilevers, etc.) if located near or within a road crossing

# Specifications for Underground Pipelines

## *General Requirements*

### 1. Use of casing pipe:

- a. A casing pipe is required for all pipeline crossings. Casing pipes must extend the full width of the right of way. Uncased pipelines will be considered on a case-by-case basis. Longitudinal pipelines that are located within 25 feet of the track centerline shall be encased.
- b. At the discretion of Metra, a casing pipe may be required for any application regardless of the commodity carried.
- c. All underground utility crossings shall be designed to withstand Cooper's E-80 Railroad live loading.

### 2. Location:

- a. Longitudinal pipelines shall be located as far from any tracks or other railroad structures and as close to the right of way line as possible.
- b. Pipelines shall be designed, where practicable, to cross tracks at approximately right angles.
- c. Pipelines must be located a minimum of 50 feet from the end of any railroad bridge, centerline of any culvert or turnout (switch) area to the centerline of the pipeline crossing.
- d. Pipeline installations shall not be designed as an open cut installation where the pipeline is to be located within the limits of a grade crossing. If it is shown that no other method of installation is possible, the owner will be responsible for reimbursing Metra for all costs, to be paid in advance, associated with the removal and reconstruction of the grade crossing.
- e. Pipelines carrying liquefied petroleum gas shall, where practicable, cross the railroad where tracks are carried on an embankment.

### 3. Depth of Installation:

- a. Casing pipes shall be not less than 5 feet – 6 inches feet below the base of rail at the closest point. Deeper installations may be required to avoid conflicts with buried railroad facilities. Where the pipe is not directly beneath the track, the depth of ground cover shall be not less than 4 feet. A 6-inch-thick reinforced concrete pad shall be placed over the casing pipe if 3 feet of ground cover cannot be provided between top of casing pipe and bottom of ditch.
- b. Longitudinal pipelines less than 50 feet from centerline of track shall have minimum ground cover of 6 feet. Where the pipeline is more than 50 feet from centerline of track, the minimum ground cover shall be 6 feet.

### 4. Pipelines Within Limits of Road Rights of Way

- a. Pipelines within the limits of roadways, both public and private shall conform to the specifications contained in this document.
- b. The limits of the road right of way must be shown on all plans.

### 5. Modification of Existing Facilities

- a. Any replacement or modification of an existing carrier and/or casing pipe shall be considered a new installation subject to the requirements of these specifications.

### 6. Pipelines on Bridges

- a. Pipelines cannot be located on any bridge carrying Metra tracks.
- b. Overhead pipelines on bridges will only be considered over Metra right of way when underground installation is not feasible. When no other alternative exists, overhead pipelines will be permitted provided the following criteria are met:
  - i. Pipeline bridges over Metra tracks shall be so located as to minimize the possibility of damage from railroad equipment, vehicles, vandalism, and other causes. They shall be encased as directed by Metra.
  - ii. The vertical clearance from top of rail to the lowest part of the overhead structure shall be not less than 26 feet.
  - iii. Supports for the overhead structure shall be located outside the right of way limits or 20 feet from the centerline of the nearest track, whichever distance is greater.
  - iv. Supports within 25 feet of the centerline of any track shall have pier protection as provided in the AREMA Manual for Railway Engineering, Chapter 8, Section 2.1.5.
  - v. Complete structural plans and design calculations for the structure and foundations, signed and sealed by a Professional Engineer, shall be submitted with the application.
  - vi. A fence topped with barbed wire, or other measures, are provided which prevents access by unauthorized personnel.



7. Identification

- a. All underground installations carrying power or communication wires and cables shall be constructed and properly marked with signs bearing the name of the owner and 24 hour emergency contact information.

## Casing Pipe Requirements

Casings are oversized load-bearing conduits or ducts through which a utility is inserted:

- a. To protect the railroad from damage and to provide for repair, removal, and replacement of the utility without interference to railway traffic.
- b. To protect the carrier pipe from external loads or shock, either during or after construction.
- c. To convey leaking fluids or gases away from the area directly beneath the railroad trackage to a point of venting at the railroad property line.
- d. All steel pipes shall be coated and have cathodic protection when practicable.

In circumstances where it is not feasible to install encasement from right-of-way line to right-of-way line, casing pipe under railroad tracks and across railroad property shall extend to the greater of the following distances, measured at right angles to the centerline of track:

- a. Two (2) feet beyond toe of slope.
- b. Three (3) feet beyond ditch line.
- c. Twenty-five (25) feet from centerline of outside track when casing is sealed at both ends.
- d. Forty-five (45) feet from centerline of outside track when casing is open at both ends.

*If additional track is planned for future construction, casing must extend far enough to meet above distances given the additional track requirement.*

2. Casing pipe and joints shall be made of metal, and of leakproof construction. Casings shall be capable of withstanding the railroad loadings and other loads superimposed upon them.

Wall thickness designations for steel casing pipe for E-80 loading (including impact) are:

Nominal Diameter, (Inches)	Min. Thickness for Coated (Inches)	Non-Coated (Inches)
14 and under	0.188 (3/16)	0.250 (1/4)
16	0.219 (7/32)	0.281 (9/32)
18	0.250 (1/4)	0.312 (5/16)
20 and 22	0.281 (9/32)	0.344 (11/32)
24	0.312 (5/16)	0.375 (3/8)
26	0.344 (11/32)	0.406 (13/32)
28	0.375 (3/8)	0.438 (7/16)
30	0.406 (13/32)	0.469 (15/32)
32	0.438 (7/16)	0.500 (1/2)
34 and 36	0.469 (15/32)	0.531 (17/32)

38	0.500 (1/2)	0.562 (9/16)
40	0.531 (17/32)	0.594 (19/32)
42	0.562 (9/16)	0.625 (5/8)
44 and 46	0.594 (9/16)	0.656 (21/32)
48	0.625 (5/8)	0.688 (11/16)
50	0.656 (21/32)	0.719 (23/32)
52	0.688 (11/16)	0.750 (3/4)
54	0.719 (23/32)	0.781 (25/32)
56 and 58	0.750 (3/4)	0.812 (13/16)
60	0.781 (25/32)	0.844 (27/32)
62	0.812 (13/16)	0.875 (7/8)
64	0.844 (27/32)	0.906 (29/32)
66 and 68	0.875 (7/8)	0.938 (15/16)
70	0.906 (29/32)	0.969 (31/32)
72	0.938 (15/16)	1.000 (1)

Steel pipe shall have minimum yield strength of 35,000 pounds per square inch.

All metallic casing pipes are to be designed for effective corrosion control, long service life and relatively free from routine servicing and maintenance. Corrosion control measures must include cathodic protection when practicable.

Cast iron may be used for casing. It shall conform to ANSI A21. The pipe shall be connected with mechanical-type joints. Plain-end pipe shall be connected with compression-type couplings. The strength of the cast iron pipe to sustain external loads shall be computed in accordance with the most current ANSI A21.1 "Manual for the Computation of Strength and Thickness of Cast Iron Pipe."

The inside diameter of the casing pipe shall be such that the carrier pipe can be removed without disturbing the casing. All joints or couplings, supports, insulators or centering devices for the carrier pipe shall be considered in the selection of the casing diameter.

For flexible casing pipe, a minimum vertical deflection clearance of the casing pipe shall be three percent (3%) of its diameter plus one-half (1/2) inch so that no loads from the roadbed, track, railroad traffic or casing pipe are transmitted to the carrier pipe.

## **Carrier Pipe Requirements**

1. The carrier pipe shall be laid with sufficient slack so that it is not in tension.
2. Carrier pipe and joints shall be of acceptable material and construction as approved by the Engineer. Joints for carrier pipe operating under pressure shall be leak-proof mechanical or welded type.
3. Reinforced concrete pipe is only allowed as a carrier pipe when properly encased, and the pipeline is operated under gravity flow. Reinforced concrete pipe will need to be encased for a distance as wide as the embankment at the utility crossing. This is to protect against track failure due to joint separation.
4. Plastic carrier pipe materials include, but are not limited to, thermoplastic and thermoset plastic pipes such as PVC, ABS, HDPE, PE, and FRP. Plastic pipe shall not be used to convey any flammable liquid. Plastic pipe may be used to convey flammable gases provided the pipe material is compatible with the type of gas conveyed and the maximum allowable operating pressure is less than 100 psi.

# Construction Requirements

## General Requirements

Above-ground utility appurtenances installed as a part of an underground installation shall be located at or near the railroad property line and shall not be any closer than twenty-five (25) feet to the centerline of track.

All pipelines shall be prominently marked at right of way lines by durable, weatherproof signs located over the centerline of the pipe. Signs shall display the following:

1. Name and address of owner
2. Contents of pipe
3. Pipe pressure
4. Emergency contact telephone number

## Casing and Pipeline Installation

Casing and pipeline installations should be accomplished by directional boring, jack-and-bore, tunneling or other approved methods. Tunneling construction under tracks will be permitted only under direct supervision of a Metra Engineer. Tunneling procedures and equipment, as well as structural design, must have Metra Engineering Department approval prior to starting any work on Metra property. Generally, tunneling shall not be considered where less than six (6) feet of cover exists, or where excessively sandy, loose or rocky soils are anticipated.

Rail elevations over the work must be monitored at intervals prescribed by Metra to detect any track movement. **See Part 3 for track monitoring requirements.** Due to the danger to rail traffic that is caused by only small amounts of track movement, Metra forces may have to be called to surface the track several times.

The following requirements shall apply to these construction methods:

1. The use of water under pressure (jetting or puddling) will not be permitted to facilitate boring, pushing or jacking operations. Some boring may require water to lubricate cutter and pipe, and under such conditions, is considered dry boring.
2. Where unstable soil conditions exist, boring or tunneling operations shall be conducted in such a manner as not to be detrimental to the railroad being crossed.
3. If excessive voids or too large a bored hole is produced during casing or pipeline installations, or if it is necessary to abandon a bored or tunneled hole, prompt remedial action should be taken by the Utility Owner.
4. All voids or abandoned holes caused by boring or jacking are to be filled by pressure grouting. The grout material should be sand cement slurry with a minimum

of two (2) sacks of cement per cubic yard and a minimum of water to assure satisfactory placement.

5. The hole diameter resulting from bored or tunneled installations shall not exceed the outside diameter of the utility pipe, cable or casing (including coating) by more than one and one-half(1-1/2) inches for pipes with an inside diameter of twelve (12) inches or less, or two (2)inches on pipes with an inside diameter greater than twelve (12) inches.
6. Pits for boring, tunneling or jacking should be located outside the railroad right of way when possible. Special temporary shoring may be required due to depth of excavation and proximity to tracks. See Section 4 – Temporary Shoring Guidelines for details.

## **Vents**

In casing pipe installations, vents are appurtenances by which fluids or gases between carrier and casing may be inspected, sampled, exhausted, or evacuated.

All casing pipes, when sealed, shall be properly vented. Vent pipes shall be of sufficient diameter, but in no case less than two (2) inches in diameter and shall be attached near each end of casing, projecting through ground surface at right of way lines.

Vents shall be located at the high end of short casings and at both ends of casing longer than one hundred fifty (150) feet.

Vent standpipes shall be located and constructed so as not to interfere with maintenance of the railroad or to be concealed by vegetation. Where possible, they shall be marked and located at the property line. The markers shall give the name and address of the owner, and a phone number to contact in case of emergency.

Vent pipes shall extend not less than four (4) feet above ground surface. Top of vent pipes shall be fitted with a down-turned elbow, properly screened, or a relief valve.

For pipelines carrying flammable materials, vent pipes on casings shall be at least 16 feet (vertically) from aerial electric wires. Casings shall be suitably insulated from underground conduits carrying electric wires on railroad right-of-way.

## **Shut-Off Valves**

The Utility Owner shall install accessible emergency shut-off valves within effective distances on each side of the railroad. Where pipelines are provided with automatic control stations, no additional valves will be required.

Valves shall not be located within the railroad right of way.

Manholes should be located outside the railroad property. Manholes shall not be located within twenty-five (25) feet of railroad trackage, in the shoulder, shoulder slope, ditch or backslope; and shall not protrude above the surrounding ground without the approval of Metra Engineering.

## Part 3 - Track and Ground Monitoring

**Description.** Track, shoring, and existing structures shall be monitored for settlement and/or displacement during an adjacent excavation, pile driving, pile extraction, or other activity as directed by the Engineer.

**General Requirements.** A detailed monitoring plan shall be submitted for review and approval by the Engineer prior to the start of any work. The monitoring plan shall comply with the following minimum requirements; however, more stringent criteria may be required by Metra on a case-by-case basis:

1. Track, Shoring and Existing Structure Deflection/Settlement limits
  - a. The top of rail shall not permanently deflect more than  $\frac{1}{4}$  inch vertical or horizontal.
  - b. Any point of the shoring shall not deflect more than  $\frac{3}{8}$  inch for shoring located 18 feet from the centerline of the track or closer.
  - c. Any point of the shoring shall not deflect more than  $\frac{1}{2}$  inch for shoring located more than 18 feet from the centerline of the track. The maximum allowable vertical or horizontal displacement of rail shall be  $\frac{1}{4}$ ".
  - d. Any point of existing substructure supporting railroad track(s) shall not permanently deflect more than  $\frac{3}{8}$  inch vertical or horizontal.
  
2. Targets
  - a. Each track shall have monitoring targets at each rail.
  - b. Track monitoring shall not require track access other than to place the track monitoring targets.
  - c. Monitoring targets should be placed such that monitoring is possible when a train is present. However, monitoring during the passing of a train is not required as the train will temporarily deflect the track.
  - d. Adhesive backed reflective targets may be attached to the side of the rails temporarily. Targets should be removed once the monitoring phase is complete.
  - e. Each shoring system shall have monitoring targets at the top of the shoring and, if a braced system, at the points of bracing.
  - f. Monitor any existing substructures supporting railroad track(s) within the vicinity of the work with a minimum of 4 monitoring targets per existing substructure element.
  - g. The distance between monitoring points on rail and shoring shall be spaced no more than 10 feet apart, and rail monitoring points must extend at least 20 feet beyond the end of the shoring system(s).

- h. A plan view shall be developed for Metra review showing the location of all monitoring points.

### 3. Execution

- a. If shutdown values are reached (see below), all construction operations shall stop until the matter is resolved.
- b. Provide Metra an established contingency plan.
- c. Establish a benchmark in the vicinity of construction. Establish locations for measuring elevations on the targets at each area of construction. Survey equipment and control used for monitoring shall be accurate to 0.01'. GPS quality is not acceptable.
- d. Monitoring survey data shall be processed into an easy to interpret digital format and be submitted to Metra upon request. The document shall be formatted to keep all prior survey results in one, easy to reference location.
- e. Monitoring shall commence once any construction activity is within the limits of E-80 surcharge as defined in Metra's Temporary Shoring Guidelines.
- f. During construction and use of the shoring, monitoring may need to be performed continuously. However, during construction and use of the shoring, monitoring shall never be performed less than at least three times a day.
- g. Monitoring shall continue after final backfill is complete, at a minimum once a day for 7 days or as required by Metra.

### Contingency Plans.

- 1. The Contractor shall supply Contingency Plan(s), which anticipate reaching the Threshold and Shutdown values, for all construction activities which may result in horizontal and/or vertical track, shoring or existing structure deflection and/or settlement.
  - a. Track monitoring values
    - i. Threshold value= 1/8 inch permanent vertical or horizontal deflection
    - ii. Shutdown value = 1/4 inch permanent vertical or horizontal deflection
    - iii. Shoring monitoring values:
    - iv. Shutdown value= 3/8- in c h permanent horizontal deflection for shoring located at 18 feet or closer to track centerline.
    - v. Shutdown value = 1/2-inch permanent horizontal deflection for shoring located further than 18 feet from track centerline.



- b. Existing structure monitoring values:
  - i. Shutdown value = 3/8 inch permanent vertical or horizontal deflection and/or settlement.

The Contingency Plans shall provide the Contractor's detailed means and methods, with options if necessary.

- 2. The Contractor shall anticipate the need to implement each Contingency Plan with required materials, equipment, and personnel.
  - a. Once the Threshold value is met, the Contractor shall determine the appropriate Contingency Plan(s) and immediately discuss this plan with, and receive confirmation from, the Engineer.
  - b. Once the Shutdown value is exceeded, all project work shall stop, and the chosen Contingency Plan shall commence.
  - c. The Engineer may choose to allow and/or require the immediate implementation of specific approved Contingency Plans, submitted by the Contractor once the Shutdown value is exceeded.

# Part 4 – Temporary Shoring

## Overview

Excavation in close proximity to railroad tracks is unavoidable. This guideline is designed to assist in the preparation of shoring documents so that review time is limited.

This document is only a guideline, and the preparer is still required to follow any agency-specific requirements including: AREMA, Railroads, OSHA, IDOT, FRA, or other governing agency in the jurisdiction. Note this document is only applicable to Metra-owned tracks.

These guidelines are provided as reference and may not be taken as authority to construct without prior written approval of the Metra. The Contractor must not begin construction of any component of the shoring system affecting Metra right-of-way until written approval has been received from Metra.

## Submittals

To expedite shoring review the following items should be submitted with the review package.

- Design calculations stamped and signed by Illinois Licensed Structural Engineer
- Lateral pressure diagram
- Deflection calculations at top of wall and bracing locations including elastic deflection of the wall and the passive deflection of the resisting soil mass.
- Drawings or sketches of the proposed shoring consisting of:
  1. Plan view showing wall limits and distances from centerline of track (see attached example)
  2. Cross section (see attached example) showing excavation support system, top of rail elevation, distance from centerline of track to near face of excavation support, maximum excavation depth with elevations, elevation of bracing, tip elevation, etc.
  3. Connection details.
- Soil report and boring logs

## Design

Excavation support shall be based on AREMA Manual for Railway Engineering, Chapter 8, Section 20 and Section 24.

Lateral Pressure from train loads shall be based on Cooper E 80 train load (Figure 1) and active earth pressure due to railroad surcharge shall be calculated using the Boussinesq Equation for strip load per AREMA 8-20.3.2.2 (Figure 2). Uniform surcharge ( $q$ ) shall be based on an 8.5 foot long tie, 5 foot axle spacing and 80 kip axle load resulting in  $q=1.88\text{ksf}$ . See attached Table 1: Lateral Pressure from Train Load Example Calculation for additional variable designations

A simplified engineering analysis may be used, the railroad loading surcharge pressure may be assumed rectangular with width (P) equal to 0.8 of the maximum pressure as given by the appropriate railroad curve (Table 2: Lateral Pressure from Cooper E 80 train loads).

Temporary shoring on the Metra Electric Line may be designed for Cooper E 65 loading with approval from Metra.

All shoring systems must be analyzed for overturning, sliding and global stability.

Lateral live load deflection shall be limited to 3/8" for shoring located within 18'-0" of centerline of track and 1/2" for shoring located outside 18'-0". The maximum allowable vertical or horizontal displacement of rail shall be 1/4".

Material allowable stresses based on AREMA shall be as follow:

- Structural Steel: 0.55Fy for compression in extreme fiber. (AREMA Table 15-1-11)
- Structural Steel: 0.35Fy for Shear. (AREMA Table 15-1-11)
- Sheet Pile Sections: 2/3 of yield strength of steel. (AREMA 8.20.5.7)
- Concrete: 1/3 of Compressive Strength. (AREMA 8.20.5.7)
- Anchor Rods: 1/2 of yield strength of steel. (AREMA 8.20.5.7)

No AISC allowable stress increase for temporary loading condition will be allowed.

## General Requirements

All components of the temporary shoring system are to be removed when the shoring is no longer needed. Track cross section and drainage facilities must be restored.

All Temporary shoring systems within the clearance envelope (see attached AREMA Minimum Railway Clearance sketch) shall be terminated below the top of rail.

An OSHA acceptable handrail is required around all excavation.

No cantilever shoring will be allowed within 12 feet of active rails.

No MSE walls will be allowed within the limits of E80 surcharge.

Cold formed piling will not be accepted within the limits of E80 surcharge.

Track deflection monitoring shall be implemented. Elevations of top of rail shall be taken at 50 foot intervals for a distance to extend 100 feet beyond the limits of excavation. Elevations shall be recorded at the following intervals: prior to shoring construction, at completion of shoring construction, following first train through area, daily thereafter and once shoring has been removed or as directed by the Engineer.

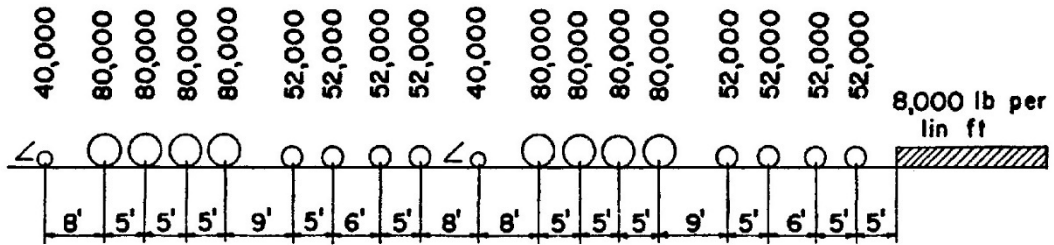


Figure 1: Cooper E 80 Load (AREMA Figure 15-1-2)

Boussinesq Equation:  $P_s = \frac{2q}{\pi} (\beta + \sin\beta \sin^2\alpha - \sin\beta \cos^2\alpha)$  (per AREMA 8-20.3.2.2.a)

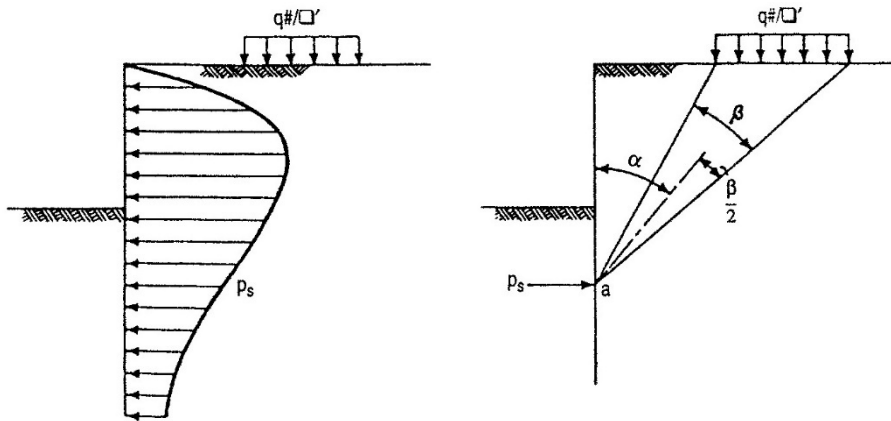
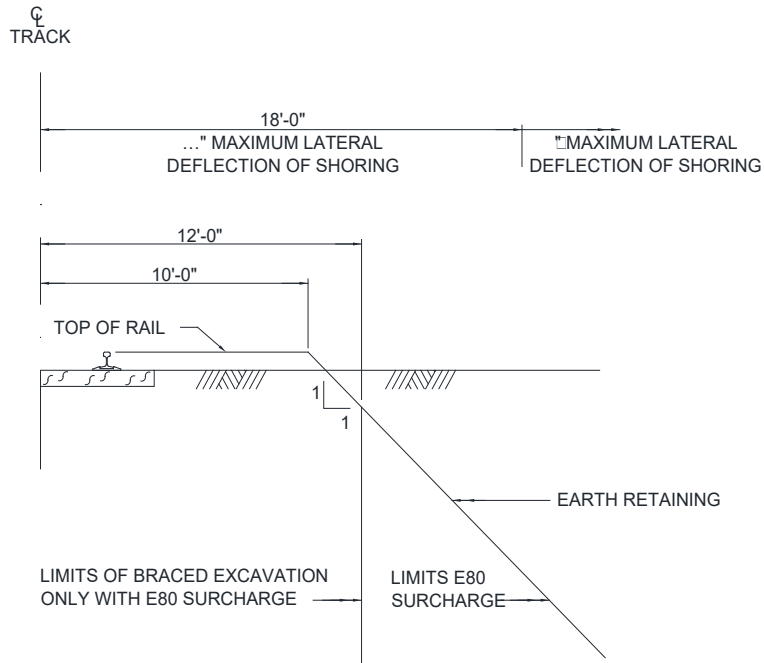
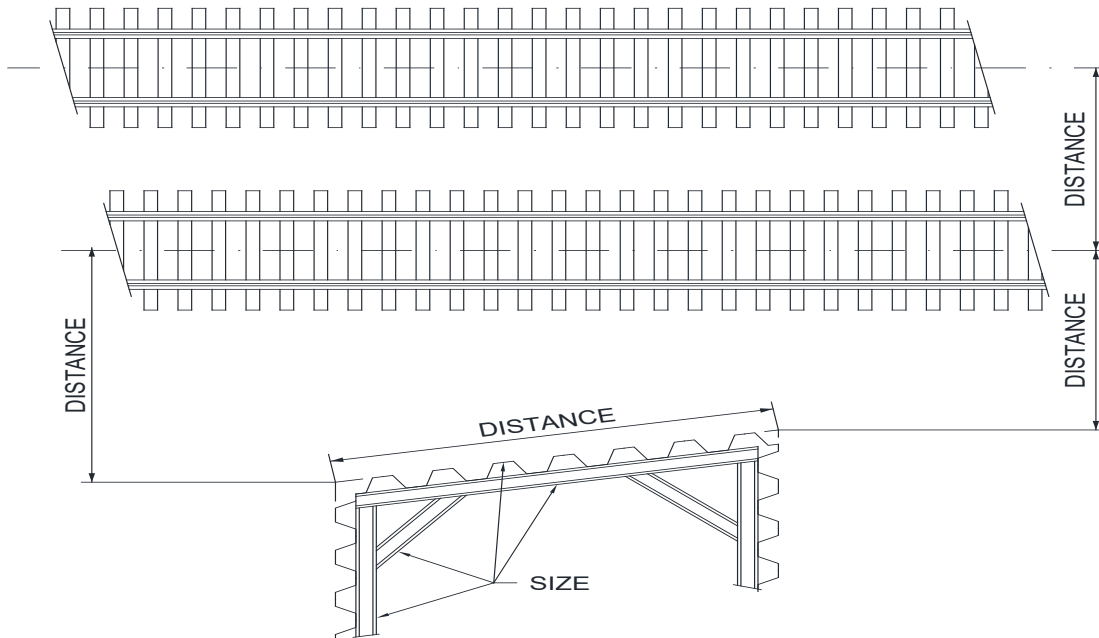


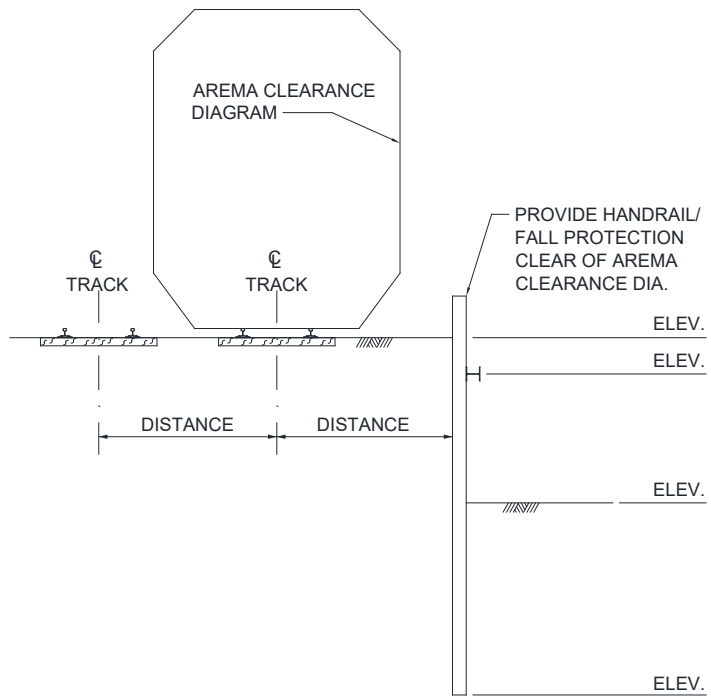
Figure 2: Pressure Distribution for Strip Load (AREMA Figure 8-20-2)



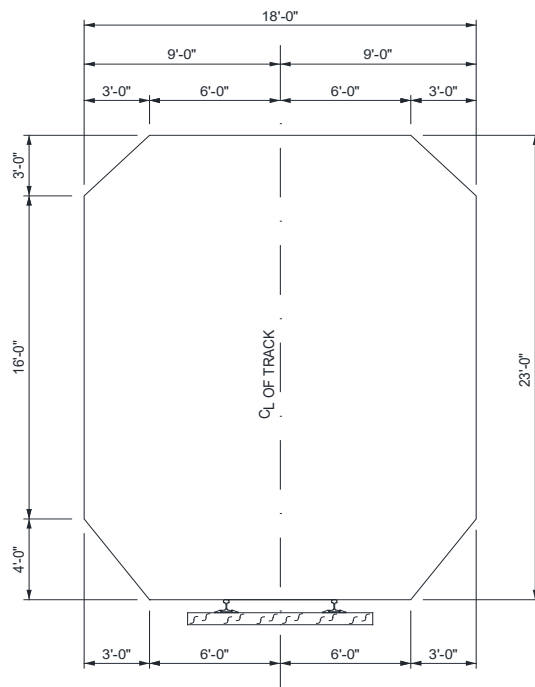
## GENERAL SHORING REQUIREMENTS



## EXAMPLE PLAN VIEW



### EXAMPLE CROSS-SECTION



### AREMA MINIMUM RAILWAY CLEARANCE

Track 1			Track 2			
Axle load	80 kips		Axle load	80 kips		
TL	8.5 ft		TL	8.5 ft		
CLT	10 ft		CLT	23 ft		
q	1.8824 ksf		q	1.8824 ksf		
$\beta$	$\alpha$	$P_s$	$\beta$	$\alpha$	$P_s$	$P_s$ total
(rad)	(rad)	(ksf)	(rad)	(rad)	(ksf)	(ksf)
0.1021	1.4497	0.2410	0.0166	1.5258	0.0397	0.2807
0.1953	1.3337	0.4409	0.0330	1.4810	0.0785	0.5194
0.2734	1.2266	0.5775	0.0490	1.4366	0.1153	0.6928
0.3341	1.1301	0.6504	0.0644	1.3928	0.1495	0.7999
0.3783	1.0442	0.6723	0.0791	1.3498	0.1805	0.8528
0.4081	0.9682	0.6591	0.0930	1.3076	0.2076	0.8668
0.4265	0.9009	0.6247	0.1059	1.2664	0.2307	0.8554
0.4360	0.8412	0.5789	0.1177	1.2264	0.2497	0.8287
0.4390	0.7880	0.5287	0.1285	1.1875	0.2647	0.7933
0.4371	0.7404	0.4781	0.1382	1.1500	0.2757	0.7538
0.4317	0.6975	0.4297	0.1469	1.1137	0.2831	0.7128
0.4241	0.6589	0.3847	0.1545	1.0787	0.2872	0.6720
0.4148	0.6238	0.3437	0.1611	1.0451	0.2885	0.6322
0.4045	0.5920	0.3068	0.1668	1.0128	0.2872	0.5941
0.3937	0.5629	0.2739	0.1715	0.9818	0.2839	0.5578
0.3826	0.5363	0.2447	0.1755	0.9521	0.2788	0.5235
0.3715	0.5119	0.2189	0.1787	0.9237	0.2723	0.4912
0.3604	0.4894	0.1961	0.1812	0.8964	0.2648	0.4609
0.3496	0.4687	0.1760	0.1831	0.8703	0.2564	0.4324
0.3391	0.4495	0.1583	0.1845	0.8454	0.2474	0.4057
0.3289	0.4317	0.1426	0.1854	0.8215	0.2381	
0.3191	0.4152	0.1288	0.1858	0.7987	0.2285	
0.3097	0.3998	0.1166	0.1858	0.7769	0.2189	
0.3007	0.3855	0.1058	0.1855	0.7560	0.2093	
0.2920	0.3721	0.0961	0.1849	0.7360	0.1999	
0.2837	0.3595	0.0876	0.1841	0.7168	0.1906	
0.2758	0.3477	0.0800	0.1830	0.6985	0.1816	
0.2682	0.3367	0.0731	0.1818	0.6809	0.1729	
0.2610	0.3262	0.0671	0.1803	0.6641	0.1645	
0.2541	0.3164	0.0616	0.1788	0.6480	0.1564	
0.2475	0.3071	0.0567	0.1771	0.6325	0.1487	
0.2412	0.2984	0.0523	0.1754	0.6177	0.1414	
0.2351	0.2901	0.0483	0.1736	0.6035	0.1343	

Variable designation

$$P_S = (2q/\pi)(\beta + \sin\beta \sin \alpha - \sin\beta \cos \alpha)^2 \quad \text{Active Pressure from surcharge loading AREMA 8-20.3.2.2.a}$$

$$B = \text{atan}[(\text{CLT} + \text{TL}/2)/H_s] - \text{atan}[(\text{CLT} - \text{TL}/2)/H_s] \text{ in radians} \quad A = \beta/2 + \text{atan}[(\text{CLT} - \text{TL}/2)/H_s] \text{ in radians}$$

q = 80 kips / (5' x TL) uniform surcharge load from trains

CLT = Distance from near face of retaining wall to centerline of track (feet) TL= Tie length (8.5 feet)

Hs = Depth below applied surcharge loading (feet)

Table 1: Lateral Pressure from Train Load Example Calculations

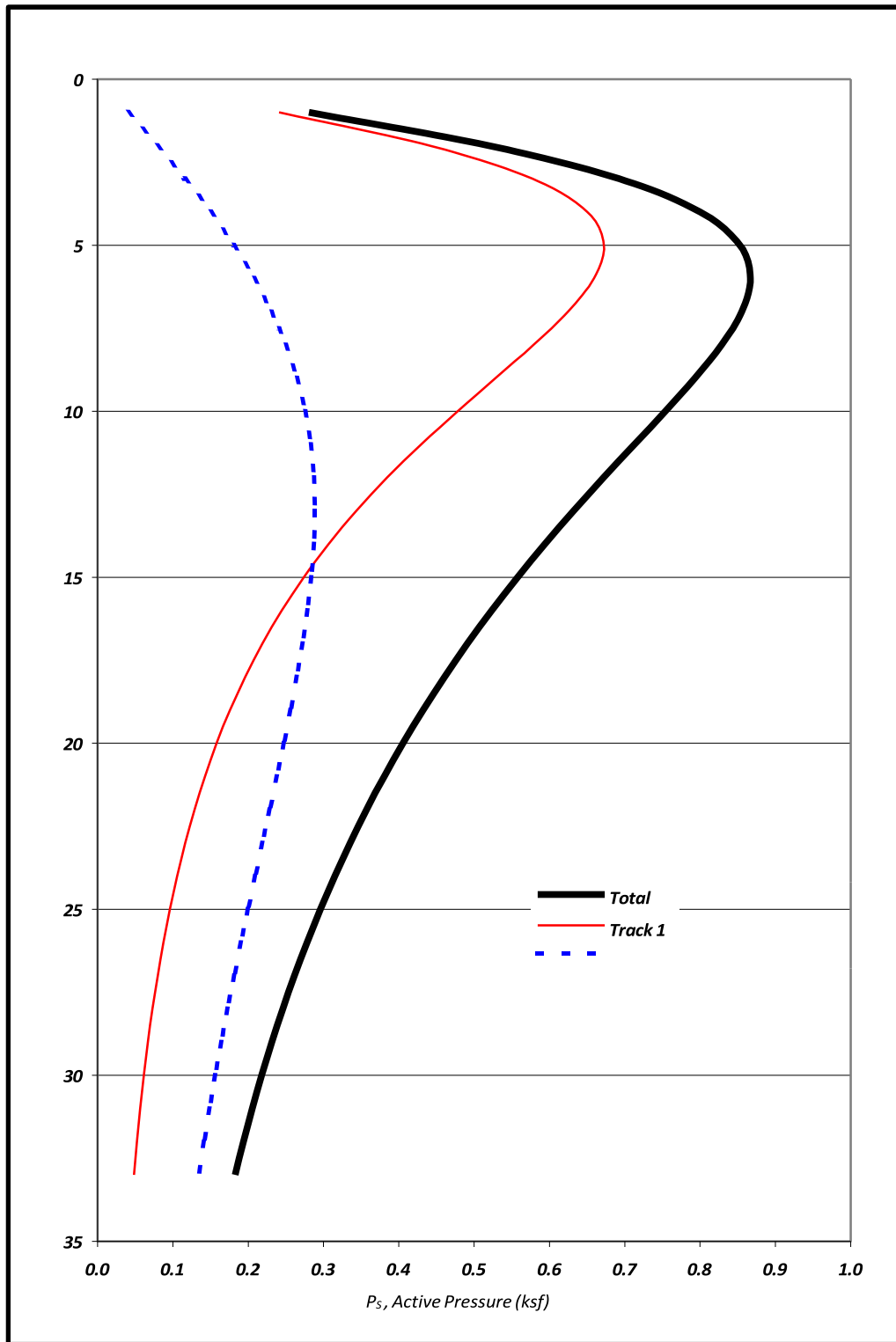


Figure 3: Lateral Pressure from Train Load Example Calculations



		CLT, Distance from near face of retaining wall to centerline of track (ft)																			
		HS	8	9	10	11	12	14	16	18	20	23	26	29	32	35	39	43	47	51	55
Depth (ft)	1		0.416	0.310	0.241	0.193	0.159	0.113	0.085	0.066	0.053	0.040	0.031	0.025	0.020	0.017	0.014	0.011	0.009	0.008	0.007
	2		0.700	0.550	0.441	0.361	0.301	0.218	0.165	0.130	0.104	0.078	0.061	0.049	0.040	0.034	0.027	0.022	0.019	0.016	0.014
	3		0.828	0.691	0.577	0.486	0.413	0.307	0.237	0.188	0.152	0.115	0.090	0.073	0.060	0.050	0.040	0.033	0.028	0.023	0.020
	4		0.846	0.746	0.650	0.565	0.492	0.378	0.297	0.239	0.196	0.150	0.118	0.095	0.078	0.066	0.053	0.044	0.037	0.031	0.027
	5		0.803	0.742	0.672	0.603	0.538	0.429	0.345	0.282	0.233	0.180	0.143	0.116	0.096	0.081	0.066	0.054	0.045	0.039	0.033
	6		0.732	0.703	0.659	0.608	0.556	0.460	0.380	0.315	0.265	0.208	0.166	0.136	0.113	0.095	0.078	0.064	0.054	0.046	0.040
	7		0.653	0.647	0.625	0.592	0.554	0.474	0.402	0.340	0.290	0.231	0.187	0.154	0.129	0.109	0.089	0.074	0.062	0.053	0.046
	8		0.576	0.585	0.579	0.561	0.536	0.475	0.413	0.357	0.309	0.250	0.205	0.170	0.143	0.122	0.100	0.083	0.070	0.060	0.052
	9		0.504	0.523	0.529	0.523	0.509	0.466	0.416	0.366	0.322	0.265	0.219	0.184	0.156	0.133	0.110	0.092	0.078	0.067	0.058
	10		0.439	0.464	0.478	0.482	0.477	0.450	0.411	0.369	0.329	0.276	0.232	0.196	0.167	0.144	0.119	0.100	0.085	0.073	0.063
	11		0.382	0.411	0.430	0.440	0.442	0.428	0.401	0.367	0.332	0.283	0.241	0.206	0.177	0.153	0.127	0.108	0.092	0.079	0.069
	12		0.333	0.363	0.385	0.399	0.406	0.404	0.386	0.360	0.331	0.287	0.248	0.214	0.185	0.161	0.135	0.115	0.098	0.085	0.074
	13		0.290	0.320	0.344	0.361	0.372	0.378	0.369	0.350	0.327	0.288	0.252	0.220	0.192	0.168	0.142	0.121	0.104	0.090	0.079
	14		0.253	0.283	0.307	0.326	0.339	0.352	0.350	0.338	0.319	0.287	0.255	0.224	0.197	0.174	0.148	0.127	0.110	0.095	0.084
	15		0.222	0.250	0.274	0.294	0.309	0.327	0.331	0.324	0.310	0.284	0.255	0.227	0.202	0.179	0.153	0.132	0.115	0.100	0.088
	16		0.195	0.221	0.245	0.265	0.281	0.302	0.311	0.309	0.300	0.279	0.254	0.228	0.205	0.183	0.158	0.137	0.119	0.104	0.092
	17		0.172	0.196	0.219	0.239	0.255	0.279	0.291	0.293	0.288	0.272	0.251	0.228	0.206	0.186	0.161	0.141	0.123	0.108	0.096
	18		0.152	0.175	0.196	0.215	0.232	0.257	0.272	0.278	0.276	0.265	0.247	0.227	0.207	0.188	0.164	0.144	0.127	0.112	0.099
	19		0.135	0.156	0.176	0.194	0.211	0.237	0.254	0.262	0.264	0.256	0.242	0.225	0.207	0.189	0.167	0.147	0.130	0.115	0.102
	20		0.120	0.139	0.158	0.176	0.192	0.218	0.236	0.247	0.251	0.247	0.237	0.222	0.206	0.189	0.168	0.149	0.133	0.118	0.105
	21		0.107	0.125	0.143	0.159	0.175	0.201	0.220	0.232	0.238	0.238	0.230	0.218	0.204	0.189	0.169	0.151	0.135	0.121	0.108
	22		0.096	0.112	0.129	0.145	0.159	0.185	0.205	0.218	0.226	0.229	0.224	0.214	0.201	0.188	0.170	0.153	0.137	0.123	0.110
	23		0.086	0.101	0.117	0.131	0.145	0.170	0.190	0.205	0.214	0.219	0.216	0.209	0.198	0.186	0.170	0.153	0.138	0.125	0.112
	24		0.077	0.092	0.106	0.120	0.133	0.157	0.177	0.192	0.202	0.209	0.209	0.204	0.195	0.184	0.169	0.154	0.139	0.126	0.114
	25		0.070	0.083	0.096	0.109	0.122	0.145	0.165	0.180	0.191	0.200	0.202	0.198	0.191	0.182	0.168	0.154	0.140	0.128	0.116
	26		0.063	0.075	0.088	0.100	0.112	0.134	0.153	0.169	0.180	0.191	0.194	0.192	0.187	0.179	0.167	0.154	0.141	0.128	0.117
	27		0.057	0.069	0.080	0.091	0.103	0.124	0.143	0.158	0.170	0.182	0.187	0.186	0.182	0.176	0.165	0.153	0.141	0.129	0.118
	28		0.052	0.063	0.073	0.084	0.094	0.115	0.133	0.148	0.160	0.173	0.179	0.180	0.178	0.173	0.163	0.152	0.141	0.130	0.119
	29		0.048	0.057	0.067	0.077	0.087	0.106	0.124	0.139	0.151	0.164	0.172	0.174	0.173	0.169	0.161	0.151	0.140	0.130	0.120
	30		0.044	0.052	0.062	0.071	0.080	0.099	0.115	0.130	0.143	0.156	0.165	0.168	0.168	0.165	0.158	0.149	0.140	0.130	0.120
	31		0.040	0.048	0.057	0.065	0.074	0.092	0.108	0.122	0.135	0.149	0.158	0.162	0.163	0.161	0.156	0.148	0.139	0.129	0.120
	32		0.037	0.044	0.052	0.060	0.069	0.085	0.101	0.115	0.127	0.141	0.151	0.156	0.158	0.157	0.153	0.146	0.138	0.129	0.120
	33		0.034	0.041	0.048	0.056	0.064	0.079	0.094	0.108	0.120	0.134	0.145	0.151	0.153	0.153	0.150	0.144	0.136	0.128	0.120

**Table 2: Lateral Pressure from Cooper E 80 Train Loads (ksf)**  
note boxed value represents the maximum pressure for each value of CLT

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## CONTRACTOR SAFETY NOTES

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Contractors to a railroad are governed by the provision of a Federal Regulation identified in the code of Federal Regulations Title 49 Part 214 (Roadway Worker Safety and Railroad workplace Safety Standards).

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## SAFETY INSTRUCTIONS

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Safety of Roadway Workers (including contractors) is of paramount importance in the performance of work being performed on Metra property. No work will be performed when there is the potential of fouling a track (i.e., when an individual or equipment is within four (4) feet of a track or could be struck by a moving train or equipment) until the following items have been completed:

1. A qualified railroad flagman (Employee in Charge) is present to provide necessary protection or authority.
2. Work (defined as inspection, testing, construction maintenance, or repair to a railroad facility) will begin only after the railroad's Employee in Charge has conducted a mandatory job briefing consisting of the following:
  - Name of flagger (employee in charge)
  - Name of lookout (if applicable)
  - Type of track authority (explain)
  - Track limits
  - Time limits
  - Protection if any, on adjacent tracks
  - Methods of notification for the approach of trains
  - Location to clear for trains
  - Procedures to arrange for on-track safety on other tracks, if necessary
  - Required personal protective equipment

Failure to comply with the provision established for clearing trains will result in the contractor's employee(s) being banned from railroad property and/or subject to personal fines as levied by the Federal Railroad Administration.

3. Contractors have the following responsibilities:

Work wear approved by Metra including:

- Highly visible orange vest conforming to A.N.S.I. 107-2015, Type R, Class 2
- Steel toed safety shoes
- A.N.S.I. approved hard hat (289.1 standards)
- A.N.S.I. meets or exceeds 287.1 eyewear standards
- Fall protection (when required) as specified in FRA Regulations 49 CFR, Part 214- Railroad Workplace Safety Standards.
- Hearing protection (when required)
- Respirator protection (when required)

4. Heavy equipment shall be equipped with audible back up warning devices.
  5. Contractors will keep the job site free from safety and health hazards.
  6. Contractors will post MSDS sheets in the construction trailer.
  7. Contractors will post these instructions in a conspicuous place in the construction trailer.
- 

## GENERAL NOTES

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None of the contractor's personnel or equipment may work upon Metra's property without a qualified railroad flagger (employee in charge) present. Contractor may work only when authorized to do so by the flagger (employee in charge).

**Contractor must contact Metra at least 5-7 days prior to work start up to arrange for flagging protection. Contact information will be provided with the completed Right of Entry agreement.**

**Metra has a very limited number of flagmen. If Metra cannot furnish a flagman for a particular date, contractor will not be allowed to work on Metra's property.**

Metra Signal and Communications Departments must locate any buried cables and/or equipment before digging may begin on railroad property and must provide protection for any such facilities during the actual construction. **Note: J.U.L.I.E. and D.I.G.G.E.R. do not locate Metra / Railroad Utilities or Facilities.**



## Application for Wireline Installation

(Attach plan and Cross Section of Proposed Installation when returning this Application)

Date:  Company Name:

Company Address:

Contact Person/Title:

Telephone:  Email:

Metra District:  Location: Latitude (decimal degrees):   
(select District)

Location: Longitude (decimal degrees):

Party with Whom Agreement will be with:   
(Legal Name to Appear in Agreement)

Location of Proposed Installation: (Distance from nearest street or railroad mile post)

Purpose of Installation: (This must be detailed & complete; attach engineering plans and details to support)

Describe Construction Methods and Equipment to be utilized:

Clearances:  
Vertical Clearance:  Horizontal Clearance:

Size and Number of Wires, Cables, Conduits, etc.: (Must conform to NESC specifications)

Wire Material Type: (Must conform to NESC specifications)

Voltage:  Phase:  Cycle:

Length of Casing:  Wall Thickness:

Method of Installation:

If Aerial Crossing, Location of Poles: (Distance to Center Line of Main Track)

If Underground Crossing, Size and Type of Crossing:

Proposed Depth of Top of Casing Pipe: (Minimum 5'6" below base of rail)

Proposed Minimum Depth below Ground Surface in Full Length of Crossing: (3' Minimum to bottom of ditches)

Angle Crossing will make with Main Tracks:

**Direct any questions concerning Metra's installation standards to:**

Mr. Timothy G. Pitzen  
Roadway Engineer  
Engineering Department  
547 W. Jackson Boulevard  
Chicago, IL 60661-5717  
Office: 312.322.6924  
E-Mail: [tpitzen@metrarr.com](mailto:tpitzen@metrarr.com)

**Submit Wireline Application to:**

Jack Uidl, Right of Way Administrator 2  
Real Estate Department  
547 W. Jackson Boulevard  
Chicago, IL 60661-5717  
Office: 312.322.8004  
E-Mail: [JUidl@metrarr.com](mailto:JUidl@metrarr.com)



## Application for Pipeline Installation

(Attach plan and Cross Section of Proposed Installation when returning this Application)

Date:  Company Name:

Company Address:

Contact Person/Title:

Telephone:  Email:

Metra District:  Location: Latitude (decimal degrees):   
(select District)

Location: Longitude (decimal degrees):

Party with Whom Agreement will be with:   
(Legal Name to Appear in Agreement)

Location of Proposed Installation: (Distance from nearest street or railroad mile post)

Purpose of Installation: (This must be detailed & complete; attach engineering plans and details to support)

Describe Construction Methods and Equipment to be utilized:

Clearances:

Vertical Clearance:

Horizontal Clearance:

Length of Casing:  Wall Thickness:

Method of Installation:

Distance to Center Line of Main Track:

Proposed Depth of Top of Casing Pipe: (Minimum 5'6" below base of rail)

Proposed Minimum Depth below Ground Surface in Full Length of Crossing: (3' Minimum to bottom of ditches)

Angle Crossing will make with Main Tracks:

**Direct any questions concerning Metra's installation standards to:**

Mr. Timothy G. Pitzen  
Roadway Engineer  
Engineering Department  
547 W. Jackson Boulevard  
Chicago, IL 60661-5717  
Office: 312.322.6924  
E-Mail: [tpitzen@metrarr.com](mailto:tpitzen@metrarr.com)

**Submit Pipeline Application to:**

Jack Uidl, Right of Way Administrator 2  
Real Estate Department  
547 W. Jackson Boulevard  
Chicago, IL 60661-5717  
Office: 312.322.8004  
E-Mail: [JUidl@metrarr.com](mailto:JUidl@metrarr.com)



## Application for Right of Entry

(Attach any pertinent Plans or approval correspondence when returning this Application)

Date:  Company Name:

Company Address:

Contact Person/Title:

Telephone:  Email:

Metra District:  Location: Latitude (decimal degrees):   
(select District)

Location: Longitude (decimal degrees):

Location:

(Distance from nearest street, intersection or railroad mile post)

Purpose: (This **must be detailed and complete**; if applicable, attach engineering plans and details to support)

Note: Please only describe the portion of the project related to this request to enter Metra property

Does Work on Metra property include:

Soil Borings – to what depth:

Excavation – to what depth:

Construction:

Demolition (Describe):

Bridge Inspection:

Bridge Repair:

Other (explain):

Will equipment be used on Metra property?      yes                      no

(if yes, explain):

Does Access to property require crossing Metra tracks (explain)?:

(if yes, how/where)                      At public crossing  
    Other (explain)

Will equipment overhang Metra track or property at any time?      yes                      no

If yes, (explain):

Expected length of time needed on Metra property:

List all sub-contractors (address & phone), if applicable, needing access to Metra property in conjunction with this project (if none, write none):

**Submit Right of Entry Application to:**  
Jack Uidl, Right of Way Administrator 2  
Real Estate Department  
547 W. Jackson Boulevard  
Chicago, IL 60661-5717  
Office: 312.322.8004  
E-Mail: [JUidl@metrarr.com](mailto:JUidl@metrarr.com)