

EMPIRE CITY SUBWAY COMPANY (LIMITED)
MANHOLE STANDARDS

1.0 Introduction

- 1.1** This document reviews issues, and states in general terms, what is required in order to perform work within ECS Conduit System in Manhattan and the Bronx safely and in compliance with all existing rules, regulations, standards, and practices. All Tenants and their authorized contractors shall comply with these Manhole Standards. Failure to comply may endanger employees, the general public, ECS's Conduit System or Tenant's Facilities, and may result in ECS imposed remedial measures including but not limited to barring Tenant from performing work in ECS Manholes.
- 1.2** ECS's Manhole Standards are a set of practices and procedures to be followed when working in ECS Manholes. These Standards include, but are not limited to, placement and maintenance activities for rope, Innerduct, Cable, Conduit, electronic devices, and apparatus cases, and the racking/storage of such Facilities. These Standards exist for quality assurance purposes, safety considerations, facility protection, and environmental issues.

Note: In addition to these Manhole Standards, it is the responsibility of each Tenant/Contractor to know and comply with the rules and regulations of local, state and federal authorities, as well as those of the National Electric Code (NEC), National Electric Safety Code (NESC) and Occupational Safety & Health Administration (OSHA).

2.0 ECS Procedures

- 2.1** ECS's Conduit Occupancy Agreement, including all Exhibits thereto, contains definitions, specifications, insurance requirements etc., which are applicable to Manhole work. Tenants shall be familiar with their responsibilities and all rules, and regulations, policies, practices and procedures, and the proper use of applicable forms contained therein, before any work is performed in ECS Manholes.
- 2.2** Before performing any Subsidiary Conduit Construction or Point of Entry (POE) work, Tenants and/or Customer-Owned Coin Operated Telephone (COCOT) operators shall be familiar with their obligations under New York State Code 753 regulations (16 NYCRR Section 753). In New York City, the telephone number for the NYC/LI One-Call Center is 800-272-4480.

3.0 Quality Assurance

- 3.1** Tenants shall use their best efforts to maintain ECS's Manholes in a condition that does not hamper work and allows maximum use of space for all Tenants. ECS reserves the right to have a representative present at any time during and/or after any Manhole work is performed. It is the responsibility of each Tenant, their employees, agents and contractors to report any improper or substandard conditions in Manholes using the Manhole Quality Review Sheet attached. Improper or substandard Manhole conditions include, but are not limited to, the following:

- a. Defects in the Manhole structure (walls, floor, roof, chimney, etc.). Worn, broken, defective or missing hardware (locking bars, innerpans, racks, ladders, ladder hooks, etc.). Tenants can obtain ladders (of known length), innerpans and locking bars from ECS by calling 718-402-8533 and picking up any such items required.
- b. Environmental conditions (oil, gas, sewer, natural gas, excessive water, etc.) requiring immediate attention.
- c. Excessive Cable congestion, poor Cable placing quality (excessive Innerduct / excessive slack or coil length), proper Cable racking/support, air leaks, or any damaged Cables or equipment.
- d. Damage to Cables or equipment or any other potential service affecting condition must be reported to the ECSC immediately by calling (718) 620-9110. Cables in jeopardy or failing and other potential service affecting conditions shall have priority over all other work. The damaged Facilities shall be protected until the owner of the Facilities arrives and identification has been made.

4.0 ECS Manhole Opening Notification

- 4.1 For each Manhole opening, Tenant shall obtain an ECS Manhole opening number in accordance with ECS's Automated Manhole Opening System (AMOS) procedures.

5.0 General Safety Precautions/ Work Rules

- 5.1 Tenants shall comply with the following General Safety Precautions and Work Rules:
 - a. Protective and warning devices shall be placed around the Manhole to provide a safe work area, prior to opening the Manhole. They shall remain in place until the Manhole is closed.
 - b. Position vehicles so that exhaust gas will not be picked up by the Manhole blower or could be blown into the Manhole.
 - c. Face oncoming traffic whenever possible.
 - d. Stanchions or traffic cones shall be placed to form a rectangle around the Manhole. Rope off rectangle with high visibility warning tape.
 - e. Traffic cones shall be placed to warn and divert pedestrian and vehicular traffic.
 - f. Whenever a Manhole is opened, a Manhole guardrail shall be put in place. The guardrail shall be of the round type, which fits into the Manhole casting's inner lip (the square guardrail type is not to be used). Care should be exercised to ensure that the locking bar or any debris/other objects do not fall into the Manhole at any time.
 - g. Use extreme caution when opening and closing Manhole with square cover that can fall into the Manhole.
 - h. Before entering a Manhole, test for combustible gas and purge with air blower. If gas is present after purging, do not enter the Manhole and immediately notify ECS of the condition.

- i. If there is no indication of gas after purging, continuously ventilate with air blower and perform hourly gas tests while working in the Manhole. If gas appears during ventilation, vacate the Manhole and immediately notify ECS of the condition.
- j. If an air leak is observed in a Manhole, immediately call Verizon Cable maintenance at (212) 219-1700, prior to entry. Reports can be made to this telephone number 24 hours/day, 7 days/week.
- k. Do not leave open Manhole unattended for any period of time.
- l. No smoking is allowed in or near Manholes.
- m. Do not use open flames in or in close proximity to a Manhole, even if tests indicate that the atmosphere is free of gas.
- n. Keep Manhole and surrounding area clean and clear of any obstructions. Clean excess debris from Manhole innerpans and lips prior to closing the Manhole.
- o. A watch person shall be stationed immediately outside the Manhole opening at all times a person or persons are in the Manhole.
- p. Inspect Manhole ladders before use; ladders must always be used to enter and leave a Manhole. If a ladder is worn, defective or missing, obtain a new ladder prior to entering the Manhole.
- q. Persons working in Manholes shall at all times have a secure standing position within the structure.
- r. Never step on Cables/equipment/racks.
- s. When artificial lighting is required in a Manhole, the bulb shall have a protective covering to minimize the possibility of breakage.
- t. Report to the ECSC at (718) 620-9110 or 6487 all work requiring the handling or moving of another Tenant's Facilities before the start of any work operation. This will afford the affected Facility owner the opportunity to assess the impact. A reasonable amount of time, based on the assessed impact, will be allowed for the affected Tenant to perform the work.

6.0 Work Area Protection

6.1 The following procedures apply to work area protection:

- a. The use of protective and warning devices is mandated by the New York City Department of Transportation. Warning and protective devices may include, but are not limited to, the following:
 - Flagger
 - Flashing Lights
 - Hard Hats
 - Work Area Lights

- Motor vehicle
 - Police Protection / Flaggers
 - Safety Vests
 - Traffic Cones / Barricades / Stanchions
 - Warning Signs
 - Warning Tape
- b. Warning Signs may be diamond shaped with a black legend on an orange background. The sign must be made of reflective or illuminated material during overcast or darkened conditions. Certain sign sizes and placement locations on the roadways are dependent on state or local laws/regulations. It is the responsibility of Tenant to ensure that its employees, agents and contractors know and comply with all applicable laws, rules and regulations governing such work.
- c. Traffic Cones are to be made of material that will withstand impact without damage. Orange is usually the dominate color with a reflective or illuminated tape for darkened or nighttime conditions. Traffic cones must be used together with warning signs.
- d. Motor Vehicles may serve as an effective barrier for vehicular traffic. The vehicle should be used in conjunction with other work area protections. Lights, flashing lights and truck direction are extra precautions that should be considered.
- e. Police Protection / Flaggers may be used to alert and properly maneuver traffic, safely and slowly, around the work area. It is the responsibility of each Tenant/contractor to know and obey state and local laws/regulations that govern these safety precautions.

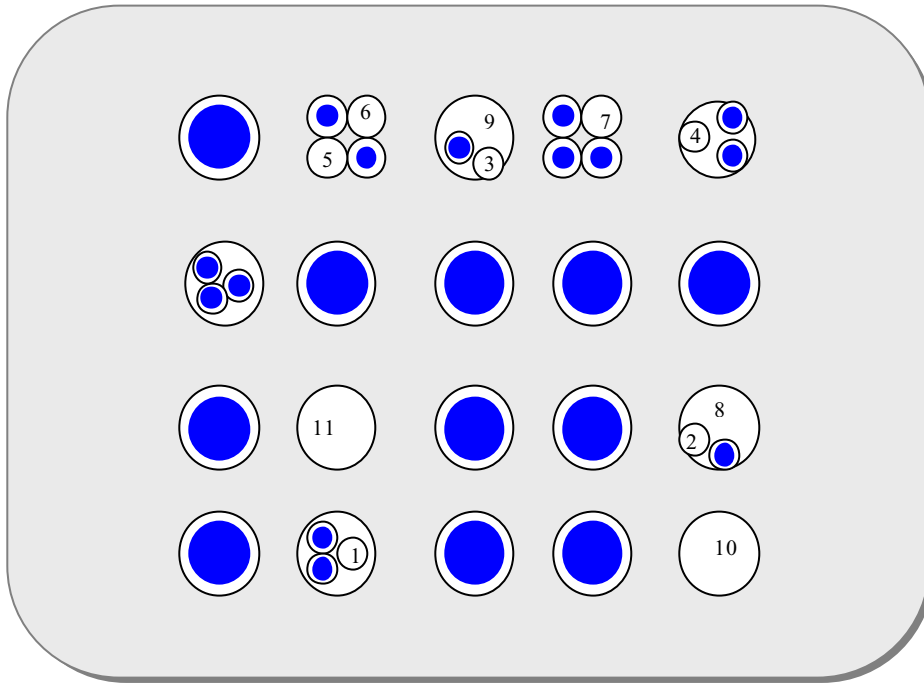
7.0 Rodding and Roping Ducts

7.1 The following work rules are applicable when rodding and roping ducts:

- a. Tenants shall rod and rope Ducts in the following Order of Preference:
1. **Spare Innerducts** (starting with the lowest, center most Innerduct and moving outward, then upward, row-by-row) until all possibilities are exhausted, then,
 2. **Spare Quad Ducts** (starting with the lowest, center most Quad Duct and moving outward, then upward, row-by-row) until all possibilities are exhausted, then,
 3. **Unoccupied Space in an Occupied Conduit** (starting with the lowest, center most Space and moving outward, then upward, row-by-row) until all possibilities are exhausted, then,
 4. **Spare Conduit** (starting with the lowest, center most Conduit and moving outward, then upward, row-by-row).

For purposes of this provision, center-racked Manholes shall be treated as two (2) separate compartments.

The following diagram illustrates the sequence that ducts in a typical Manhole wall should be rodded following the Order of Preference:



- b. If ECS determines that Tenant has Occupied any Duct without following the Order of Preference set forth above, Tenant shall relocate its facilities, at its own expense, to comply with the order of preference within fifteen (15) days of receipt of written notice from ECS. Tenant shall also reimburse ECS for any costs it incurred to determine that Tenant has Occupied the Duct without following the Order of Preference. Hand rodding is required in situations where new Innerduct must be installed with existing Innerduct (see Order of Preference Diagram # 8 and 9).
- c. Whenever possible, rodding equipment shall be placed in line with and on the opposite side of the Manhole Section to be rodded.
- d. A feeder tube/guide hose is to be used to guide the rod from the truck into the selected Duct. The feeder tube/guide hose shall be seated in the Duct and secured tightly to prevent movement.
- e. All equipment shall be secured in a position that will prevent any equipment, including the rod and rope, from contacting any Tenant's Facilities.
- f. Set the footage meter to zero and know the length of the Duct being rodded. Begin pushing rod; frequently check the feeder tube/guide hose to ensure that it remains secure. On long or muddy sections, the rod may stop due to a binding action; to relieve this, rotate the rod counter clockwise and slowly push forward while rotating the rod clockwise. Do NOT rotate the rods in tile ducts. When an obstructed Duct is encountered, note the distance penetrated and retract the rod. All obstructions should be reported to ECS.

- g. Ropes shall not be tied to Cables, ladders or pulling irons. Use a Duct plug with rope attachment or tie the rope neatly to a Manhole rack.
- h. No temporary or permanent rope/equipment shall be placed in Manhole chimneys.
- i. All entrance Ducts to buildings shall be plugged and tagged on both the building and Manhole side. Entrance plugs are to be water/gas tight.
- j. All ropes must be tagged with the Tenant's name and the date the rope was placed.
- k. Rodding and roping is to be performed only by trained personnel. Training requirements and acceptable work operation practices are outlined in ECS Manhole Activity Program.

8.0 Placing Cable, Innerduct and Air Pipe

- 8.1** The following guidelines shall apply generally when placing Cable, Innerduct, air pipe, etc.:
- a. When placing Innerducts for the first time in a Conduit, Tenants shall place the maximum number of Innerducts that can be accommodated in the Conduit (e.g., three Innerducts in a 4" Conduit or two Innerducts in a 3" Conduit).
 - b. Tenants shall not place any Cable having a diameter of 2" or less in any Conduit having a diameter greater than 2.5" without using Innerduct.
 - c. A quadrant block or Manhole sheave shall be used along with a Cable shoe or leadergard while pulling Innerduct or Cable. The use of a Cable feeder is recommended to maintain proper curvature.
 - d. All pulling equipment shall be secured in a position that will prevent any equipment or pulling lines from contacting existing Cables or other Tenant Facilities.
 - e. All Innerducts shall be cut at a maximum of 6" from the interior wall of the Manhole where splice coils are to be placed.
 - f. Innerduct will be brought to, cut and tied to the first racking position in pull through Manholes to facilitate the coupling of ducts for proper racking. In some cases it may be necessary to cut smooth Innerduct within 6" of entering the Manhole and couple it with corrugated or split Innerduct within the Manhole, in order to make necessary bends for proper racking.
 - g. To prevent congestion, ECS reserves the right to prohibit the placement of any Innerduct within a Manhole. In these cases, a covering such as coraflex may be placed over the fiber Cable. Innerduct placed for greater than six months, without any Cable placement, may subject the duct to forfeit.
 - h. Final racking will be after Innerduct is placed. Cables must be racked so that they will not affect or obstruct other Tenants' facilities.
 - i. When placing into a building, Innerduct (as well as the duct itself) must be plugged or capped as to be water/gas tight both in the building & the Manhole.
 - j. Tenant's identification must be on all Innerduct and Cables placed.

- k. Excessive fiber length should be looped around the Manhole in long sweeping bends and secured with Cable ties. Where long sweeping bends are not feasible/possible, hand coils are acceptable.
- l. Hand coils, not to exceed 36" in diameter, should be racked in a location where it will not be subject to damage or cause Manhole congestion (preferably on the Manhole wall behind in-place Cables). Hand coils must be secured with Cable ties.
- m. Due to potential Manhole congestion and space limitation, fiber hand coils will not be allowed in every Manhole. Design information, identifying a pull through or splice Manhole, is to be known in the field during Innerduct and Cable placement.
- n. Hand coils are allowed only in intermittent pull through Manholes and only where it will not cause Manhole congestion.
- o. The amount of hand coil left in a Manhole is to be determined by measuring from its racking position to the lip of the Manhole plus an additional 20' to allow for immediate or future splicing. Existing excessive slack is to be removed as part of routine facility maintenance.
- p. For all new fiber hand coil placements, the associated Cable splicing work must be performed within a reasonable amount of time.
- q. Support all Innerduct, Cables, splice cases, and air pipe to racks. Do not tie to another Tenant's facility without permission. Ensure that the other facility is capable of supporting the new installation and will not cause it any damage.
- r. Innerduct/Cable placement is to be performed only by trained personnel. Training requirements and acceptable work operation practices are outlined in ECS's Manhole Activity Program.

9.0 Facilities Owned by Tenants

9.1 The following guidelines are applicable to all Facilities owned by Tenants:

- a. Apparatus cases or ancillary equipment shall not be placed without prior approval from ECS.
- b. No temporary or permanent Innerduct/Cable/equipment shall be placed in Manhole chimneys.
- c. Cables will be racked so unoccupied ducts are not obstructed.
- d. A tag of corrosion resistant material suitable for the environment shall be placed to identify each Cable, Innerduct and piece of equipment in Manholes.
- e. Tags should be placed on Cables, including Subsidiary Cables, between the point of emergence from a duct and the first Cable rack.
- f. If more than one Cable occupies the same Conduit, each Cables shall be tagged separately.
- g. Each tag shall include the following information: Tenant name and date the facility was placed.

- h. Tags for Cables should also include Tenant's 24 hour telephone number and Cable identification/designation.

10.0 Splicing

10.1 The following guidelines apply when splicing in a Manhole:

- a. Splice cases will be centered on hangar steps between racks with locking clips and Cable ties.
- b. When splicing fiber, store excess fiber in a coil no larger than 36" in diameter. The amount of slack coil left in a Manhole is to be determined by measuring from its racking position to the lip of the Manhole plus an additional 20' to allow for splicing. Excessive slack on existing coils is to be removed. Slack coils are to be properly fastened to racks with Cable ties.
- c. All Tenants/contractors are responsible for leaving the Manhole clear of debris at the end of each day's activity.

11.0 Environmental Conditions

11.1 The following guidelines address environmental conditions:

- a. Proper testing and disposal of water, debris, and sediment is the responsibility of each Tenant/contractor in the Manhole. Sediment clean out requires visual evaluation and testing prior to removal. Any testing and removal must be done by an Empire City Subway approved vendor.
- b. All motor vehicles with hydraulic lift equipment must be equipped with a spill containment kit.
- c. Pumps must be raised 3" above sediment layer before and during water removal from Manholes.
- d. It is the responsibility of each Tenant/contractor to report all spills to the proper authority.

12.0 Cleanup and Closing Manholes

12.1 Each Tenant/contractor is responsible for the proper disposal of Manhole wastewater and for leaving the Manhole in a clean and workable condition after each day's activity.

- a. Innerpan and lip must be cleaned out and free of dirt and debris so that it can be properly seated. All dirt and debris must be disposed of properly. Do not allow any dirt or debris to fall into the Manhole.
- b. The locking bar shall be tightly secured.
- c. Perform visual evaluation of the Manhole to identify any structural damage, Cable facility damage and/or debris left in Manhole prior to closure. Under no circumstance shall any rope, Innerduct, Cable scraps or any other debris be left in the Manhole.
- d. Do not use Manholes for storage of tools or supplies.

13.0 Interconnection of Telephone and Electric Manholes

- 13.1** Tenants or Con Edison shall be jointly or severally responsible for constructing, owning and maintaining a Manhole between each ECS Manhole that is interconnected with a Con Edison Electric Manhole (“Intermediate Manhole”). The costs of construction, ownership and maintenance of Intermediate Manholes shall be borne by Tenants and Con Edison.
- 13.2** Tenants or Con Edison shall be solely or severally responsible for constructing, owning and maintaining all Conduits between ECS Manholes and Intermediate Manholes and Conduits between Intermediate Manholes and Con Edison Electric Manholes (“Interconnecting Conduits”). The costs of construction, ownership and maintenance of Interconnecting Conduits shall borne jointly or severally by Tenants and Con Edison.
- 13.3** Intermediate Manholes and Interconnecting Conduits shall be designed, constructed and maintained in accordance with the following guidelines and specifications:
- a. Intermediate Manholes shall be designed to mitigate the effect of explosions and block the “migration” of fires and run-off of environmental contaminants into ECS Manholes.
 - b. Intermediate Manhole covers shall be of a design that is consistent with existing Con Edison Electric Manhole covers or shall have some permanent distinguishing feature or marking to permit easy identification of the ownership of the structure
 - c. Interconnecting Conduits shall have some permanent feature or marking to distinguish them from other conduits in ECS Manholes.
 - d. Interconnecting Conduits entering and leaving the Intermediate Manhole shall be offset from each other so as to minimize “through rodding” of Interconnecting Conduits between ECS and Electric Manholes.
 - e. No Innerduct of any kind shall be permitted inside the Intermediate Manhole.
 - f. Interconnecting Conduits and associated Innerducts shall be sealed at all four Manhole penetration points (i.e., once in ECS Manhole, twice in the Intermediate Manhole, and once in the Con Edison Electric Manhole). Seals shall be made of fire retardant material. Any party performing work on cables, Innerducts or conduits shall replace all seals each day prior to leaving the Manhole.
 - g. Interconnection shall not be permitted in “Zero” Manholes (i.e., the first ECS Manhole outside a telecommunications company central office or node).
- 13.4** Tenants and Con Edison shall comply with the following specifications for protecting against stray electrical currents:
- a. Interconnecting Cables between ECS and Con Edison Electric Manholes shall be made of dielectric fiber and contain no electrical conductive material whatsoever.
 - b. No pull wires, tracer wires or any other conductive material may be placed within Interconnecting Conduit or Innerduct.
 - c. Interconnecting Conduit shall be made of PVC or other non-conductive material.

13.5 Upon notice, ECS shall have the right to inspect Intermediate Manholes, Interconnecting Conduit, Innerducts and cabling to ensure compliance with the requirements contained herein. The owner of the Interconnecting Conduit shall reimburse ECS for all costs of such evaluations.