
MANHOLES

AT&T 622-500-011, 919-240-300

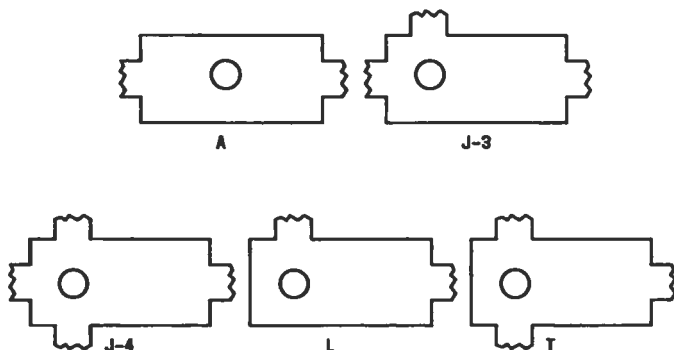
Planning and Design Considerations

- Locate manhole to make optimum use of the connecting conduit structure for cable-placing operations.
- Use precast manholes wherever possible for economy, uniformity, quality control, and quick installation.
- Use cast-in-place construction when: (a) required manhole size exceeds range of precast manholes, (b) obstructions prevent use of precast manholes, (c) manhole is to be rebuilt, or (d) nonstandard designs are required.
- Size manhole for ultimate duct requirements.
- Plug all ducts to minimize entry of water into manholes.

Sizes and Types of Manholes

Basic Manholes

Basic manholes are designated A, J-3, J-4, L, and T, according to the directions in which ducts enter and leave the manhole, as illustrated below.



**CONDUIT
MANHOLES**

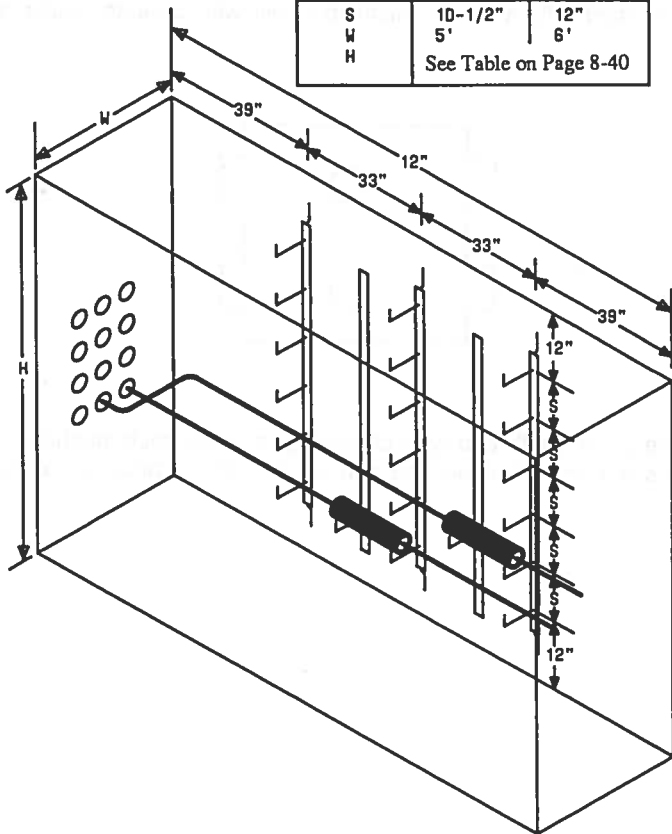
Sizes

Recommended dimensions of basic manholes are shown below. These sizes allow racking space to accommodate one stub for every four main cables. The ultimate number of main cables must be distributed equally among all racking positions.

BASIC MANHOLE INSIDE DIMENSIONS				
Type of Racking	Ultimate No. of Main Cables (Note)	Width ft (m)	Length ft (m)	Headroom ft (m)
Single	Up to 10	5 (1.5)	12 (3.7)	7 (2.1) plus one for every two cables in excess of 20
Double	Up to 20	6 (1.8)	12 (3.7)	7 (2.1)
	>20	6 (1.8)	12 (3.7)	7 (2.1) plus one for every tier of ducts in excess of 20
<p>Note: The ultimate number of main cables shown are for copper paired cables. The capacity would be increased with fiber optic cables.</p>				

CONDUIT MANHOLES

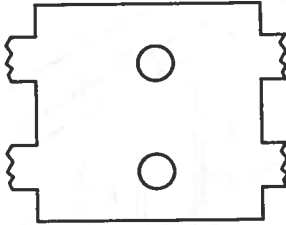
DIMENSION	SINGLE-RACK	DOUBLE-RACK
S	10-1/2"	12"
W	5'	6'
H	See Table on Page 8-40	



CONDUIT MANHOLES

Center Rack Manholes

When the planned cable capacity calls for a manhole of impractical or uneconomical depth, a wider and shallower cast-in-place manhole may be built and arranged for center racking as well as wall racking. A center rack manhole is essentially a double-width manhole with a center cable racking frame.



For the same depth and type of racking, a center rack manhole is twice as wide as a basic manhole and can accommodate twice as many main cables.

Precast Manhole

AT&T 622-506-100, 919-240-300

Precast manholes are available with cast-in single or multiple plastic duct terminators to accept single-bore conduit. Thin concrete knockout sections may also be provided for terminating multiple-bore concrete conduit. The top section contains knockouts for subsidiary or lateral ducts.

Precast manholes for general use are listed below. Manholes for loading and carrier apparatus are listed below and on the next two pages.

PRECAST GENERAL-USE MANHOLES							
Basic Manhole Designation	Midsection Designation	Config- uration	Number of Sections	Inside Dimensions ft (m)			Capacity (Number of Main Cables) (Notes)
				W	L	H	
38Y-4046-1	—	A	2	6	12	7	20
38Y-4046-3	—	J, L, T		(1.8)	(3.7)	(2.1)	
38Y-4046-1	38Y-4049-1	A	3*	6	12	10*	28
38Y-4046-3	38Y-4049-3	J, L, T		(1.8)	(3.7)	(3.0)	
38Y-4046-1	38Y-4050-1	A	3*	6	12	12*	36
38Y-4046-3	38Y-4050-3	J, L, T		(1.8)	(3.7)	(3.7)	
38Y-4052	—	A	2	4	8	6	4†
				(1.2)	(2.4)	(1.8)	
<p>Note: Based on copper paired cables.</p> <p>* Including midsection.</p> <p>† For splicing on light, secondary conduit runs or buried cable runs.</p>							

**CONDUIT
MANHOLES**

PRECAST CARRIER APPARATUS MANHOLES								
Basic Manhole Designation	Midsection Designation	Configuration	Number of Sections	Inside Dimensions (ft)			Carrier System	Capacity
				W	L	H		
38Y-436-6	—	A	2	6	12	6-1/2	T2	2 dual-cable systems using 52-pair cables, or 1 dual-cable system using 104-pair cables
38Y-4036-7	—	Single-ended						
38Y-4046-1	—	A	2	6	12	7	T1, T1C	Dual 600-pair cables
38Y-4046-1	38Y-4049-1	A	3*	6	12	10*	T1, T1C	Dual 900-pair cables
38Y-4046-1	38Y-4050-1	A	3*	6	12	10*	T1, T1C	Dual 1200-pair cables
38Y-4046-4	—	A	2	6	12	7	T4M	One 22-tube coaxial cable
38Y-4046-4	38Y-4049-4	A	3*	6	12	10*	T4M	Two 22-tube coaxial cables
38Y-4052	—	A	2*	4	8	6	T1, T1C	Four 475- or 479-type apparatus cases

* Including midsection.

PRECAST LOADING MANHOLES							
Basic Manhole Designation	Midsection Designation	Configuration	Number of Sections	Inside Dimensions ft (m)			Capacity (Number of Coil Cases) (See Note)
				W	L	H	
38Y-4046-1	—	A	2	6 (1.8)	12 (3.7)	7 (2.1)	4
38Y-4046-1	38Y-4050-1	A	3*	6 (1.8)	12 (3.7)	12*	10
38Y-4048	—	A	3	6 (1.8)	15 (4.6)	9 (2.7)	20
38Y-4048	36Y-4051	A	4*	6 (1.8)	15 (4.6)	12*	28
<p>Note: Can vary depending on local practice. * Including midsection.</p>							

Separation From Other Structures

AT&T 622-100-010

Minimum recommended separations between telephone manholes and outside surfaces of foreign structures are as follows:

Structure	Separation
Electric light, power, or other conduits	3 inches (76 mm)
Pipes such as gas, water, oil mains	6 inches (152 mm) when crossing; 12 inches (305 mm) when parallel

FRAMES, COVERS, AND COLLARS

AT&T 622-520-100, 919-240-300

For frames and covers, the 30-inch (762 mm) size is recommended for all applications and should be specified for use with precast manholes. Although 27-inch (686 mm) frames and covers are available, their use is not generally recommended, particularly where only one manhole opening is provided. It is easier to get into and out of the 30-inch (762 mm) size, especially with a blower or pump hose in the opening, and there is more room for placing apparatus into the manhole. **The 24-inch (610 mm) frame and cover should not be used in new construction.** Available frames and covers are listed in the following table.

**CONDUIT
FRAMES, COVERS, AND COLLARS**

MANHOLE FRAMES AND COVERS			
Type	Opening Dia. in. (mm)	Height of Frame in. (mm)	Remarks
A	27, 30 (686, 762)	11 (279)	Has inner cover and sealing gasket; recommended for central office, carrier-equipped, loading, and critical junction manholes or wherever a watertight or secured cover is required
SA	27, 30 (686, 762)	5-5/8 (143)	Shallow version of A type
G	27, 30 (686, 762)	10 (254)	Has 4 equally spaced 1-in. (25 mm) diameter holes in the frame flange to permit securing the frame to concrete collars and to 38Y manhole roofs. Used with both the G (nonlocking) and H (locking) covers
SG	27, 30 (686, 762)	5-5/8 (143)	Shallow version of G type. Same remarks as G type
R	27, 30 (686, 762)	1-1/2 (38)	Used where not subject to vehicular traffic
D	30 (762)	1-1/2 (38)	Modified R with pentagonal head locking bolts
H	30 (762)	—	Covers only are equipped with two captive bolts with attached locking plates that engage the rim of either the G or the SG frame
Caution: For safety, use only one size frame on manholes with more than one opening.			

CONDUIT FRAMES, COVERS, AND COLLARS

A manhole collar provides a means for raising the manhole frame and cover to grade. Brick-and-mortar collars and concrete collars may be constructed to any height. Alternatively, the following precast concrete collars can be used, either alone or in combination, to attain the desired height for up to 10 feet (3.1 m) of cover.

38Y PRECAST MANHOLE COLLARS		
Type	Height in. (mm)	Use
38Y-4039-1	5-1/2 (140)	Not a normal collar, but an apron designed to fit around the manhole cover at grade in unpaved areas to provide a solid, ground-level work area
38Y-4039-3	3 (76)	Used with any of the frames listed in table on Page 8-47 except for D and R types. Can also be used under 38Y-4039-15R collar
38Y-4039-9	9 (229)	
38Y-4039-15	15 (381)	
38Y-4039-15R	15 (381)	Includes a 30-inch R-type frame fabricated into collar. For use with R and D covers

The above collars can be used with precast or cast-in-place manholes. At least one opening should be provided for manholes up to 12 feet (3.7 m) in length, two openings beyond 12 feet (3.7 m) in length, and three openings beyond 20 feet (6.1 m) in length. The number of manhole openings required is doubled for center-racked manholes.

Manhole Extension Rings

AT&T 622-520-201

Pavement resurfacing operations sometimes necessitate the raising of manhole covers. This may be conveniently accomplished with manhole extension rings, which are described in the AT&T document referenced above.

DUCT ASSIGNMENT AND CABLE RACKING

AT&T 632-305-215, 919-240-300

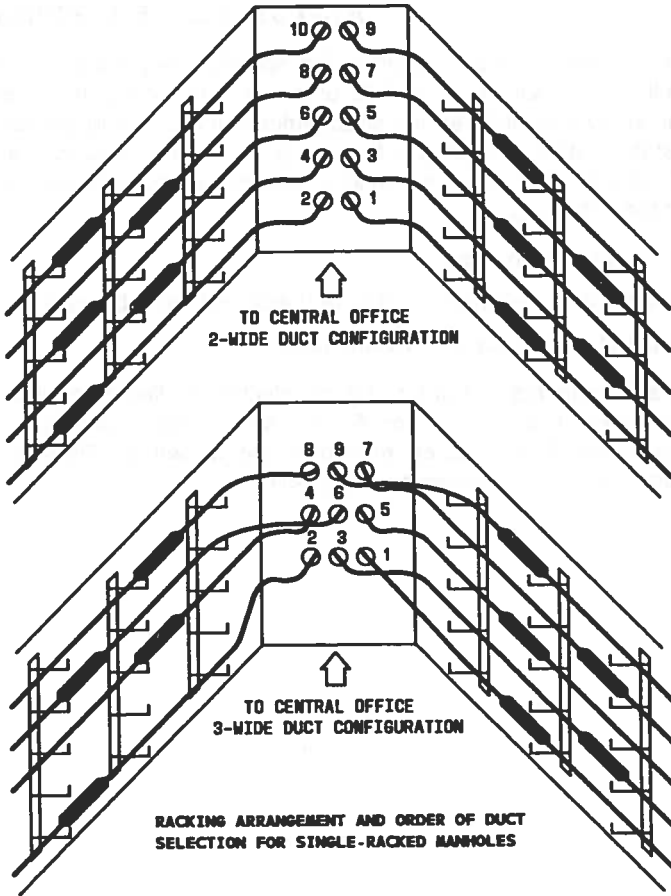
Cable rack space should be used in the specified sequence to permit work on cables after placement and to preserve work space for splicing additional cables. With double-racking arrangements, it is better to use all the outer (against the wall) rack spaces before using any inner (toward the center of the manhole) spaces. With either single or double racking, spaces should be used from the bottom up.

Ducts should be selected to avoid:

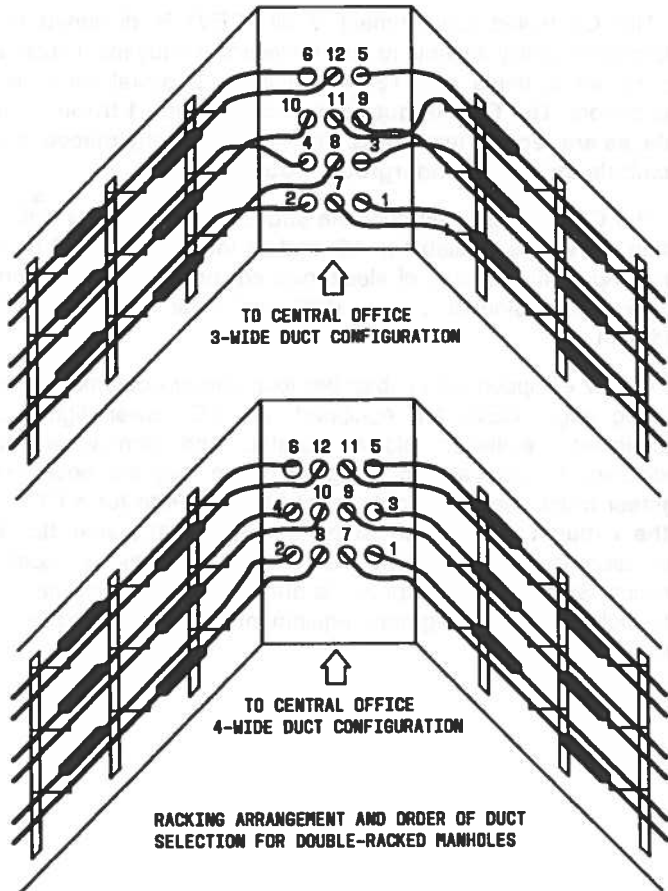
1. Cable crossovers between the duct entrance and the cable rack
2. Blockage of future access to vacant ducts.

Racking arrangements and order of duct selection for line manholes are shown on the next two pages. For A-, L-, and T-type manholes, see referenced practices. Single-racked manholes are shown on Page 8-50. Double-racked manholes are shown on Page 8-51.

**CONDUIT
DUCT ASSIGNMENT AND CABLE RACKING**



CONDUIT
DUCT ASSIGNMENT AND CABLE RACKING



CONDUIT
CONTROLLED ENVIRONMENT VAULT (CEV)

CONTROLLED ENVIRONMENT VAULT (CEV)

AT&T 622-506-225 to -228, 919-240-302

The Controlled Environment Vault (CEV) is designed to provide an underground facility suitable to house electronic equipment such as subscriber loop carrier systems or FT3/FT3C lightwave digital transmission system regenerators. **The CEV is not equipped to support through underground cable, as are regular manholes. They are generally placed in proximity to a manhole on a main underground route.**

The CEV is a precast concrete structure consisting of a top and bottom section. CEVs are available in 16- and 24-foot (4.9 and 7.3 m) length sizes, depending on the amount of electronics equipment to be housed. They have an inside dimension of 6 feet (1829 mm) wide and 9 feet (2743 mm) of headroom.

A CEV equipped with subscriber loop carrier equipment is shown on the following page. CEVs are equipped with AC power, lights, sump pump, dehumidifier, ventilation blower, heater, and atmospheric monitor. Air conditioning is optional depending on where they are being installed. **The engineer must use caution when choosing a site for a CEV. The bottom of the exhaust air vent must be above the 100-year flood level.** This information is available from insurance companies or local government agencies. Some of the equipment is above ground, which may be hazardous to the public. This aboveground equipment will be exposed to moisture such as snow.