



**Office of Capital Planning
and Project Management**

DIVISION 33

UTILITIES

This Article on Codes, Regulation and Standards shall apply
to all Divisions of the Building Standards

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33 05 13 MANHOLES AND STRUCTURES

- Castings shall conform to the requirements of gray iron castings ASTM A 48 and conform to the details shown on the drawings. Lids shall have the word "UIC ELECTRIC" cast into lid.

33 10 00 WATER UTILITIES

- All water systems and services are installed by the City of Chicago.

Note: Since alternate methods of extension or repairs are available for various portions of the work, it will be necessary to actually specify materials and methods and not to state that this document is by reference made a part of the specification and contract, or that the work is to be provided and installed in accordance with requirements of this document. New sections of water main, including fire hydrants which actually become a part of the grid system of distribution, will generally be constructed under a separate contract. The branch service connection to building, including extensions to the main and fire hydrants where required for each particular building, shall be included in the building contract unless otherwise directed by the University.

- Fire hydrants design shall be compatible with M&H, Clow, or Waterous hydrants since repair parts for these hydrants are maintained as stock by the University.
 1. Backfilling: Contractor shall obtain A/E, Facilities Management and City of Chicago approval of installation of water mains before any section is covered. Backfilling for water mains shall be specified, with particular attention given to backfilling under water mains, including the removal of previously disturbed earth outside of foundation walls, and replacing of same with sand or pit-run gravel thoroughly compacted, so as to provide a firm bed for the main at all such points.
 2. Install the domestic water system above the sanitary system when in conflict, or as mandated by code.

33 46 00 SUBDRAINAGE

- Provide footing drains and areaway drains around exterior of the building.
- Where conditions so require, provide subsoil drains under floor slabs inside the building and under tunnel floors to prevent seepage of ground water into the building.
- Drain lines should be extended to a sump and pumped to a storm sewer manhole if gravity flow is not possible. If discharge is by gravity flow, suitable means shall be provided to prevent backflow due to overloaded sewer lines.
- Provide underdrains for swales and lawn areas with less than a 2% surface slope and under new trees, planting islands in parking lots, and any planting.

- All trees, shrubs, and planting beds shall be tiled with 4 inch plastic drain tile that is wrapped with drainage fabric. The top of tile is to be placed at a depth of 36 inches below finish grade. If conditions do not permit tile installation at a 36 inch depth, a 24 inch minimum depth is permitted after approval by the University. Coordinate underground utilities and ductbanks for proper depth.
- Area wells, stairwells and access ramps below grade are not allowed unless approved by the University in writing.

33 49 00 STORM DRAINAGE STRUCTURES

- Sewers shall be run from each building and be connected to the proper City system. Sewers shall receive drainage from roof, yard, footing and underslab tile, and curb drains only. Consult with the City of Chicago Department of Sewers for detention requirements. Yard and curb drains may be constructed without basin seals. Subsoil drainage in major projects shall be provided with separate duplex bilge pump unit and discharged to sewer system.
- On University projects: Gain approval prior to the bidding procedure from the appropriate City of Chicago, and the University for the design and method of discharge and connection to existing sewers.
- Abandoned manholes and catch basins shall be removed to 2 feet below grade and filled with washed sand or gravel. All openings in abandoned manholes shall be plugged with concrete and brick. Exterior downspouts shall be provided with cast iron leader boots and cast iron pipe to bridge excavation trench along walls. Anchor boots to wall and caulk downspouts with mastic so as to allow expansion movement.
- Maximum spacing between manholes shall be approximately 300 to 400 feet, unless a waiver is requested, reviewed and approved by the University.
- Sewer wyes must be of the same material as the main-line piping.
- Saddles will only be allowed if the main line piping has a 12 inch diameter or greater. If a connection is to be made where there is no wye and the piping is smaller than 12 inches, a section of pipe shall be removed and a wye inserted with mission couplings and new sections of pipe as needed.
- Backfill of trenches under paved areas and within 2'-0" of the edge of any pavements the sewer trench must be backfilled with CA-6 trench backfill placed in 12 inch lifts and compacted to 95% of the standard Proctor unless flowable fill is used, in which case the fill shall be designed to have a compressive strength between 100 to 150 psi.
- All main lines must be capable of transmitting light between manholes. If the light cannot be seen, the sewer must be capable of passing a two-foot cylinder, which has a diameter 1 inch less than the inside diameter of the pipe being tested.
- All pavement and sidewalks are to be replaced to their original thickness, material type or types, and grade except where the old pavement was deficient, which then must be brought up to current standards.
- Do not locate catch basins within landscaped areas without the written permission of the University.
- Storm drains intake in parking lots to be in line with curb.

- Reinforce curbs over storm lines.

33 63 00 STEAM ENERGY DISTRIBUTION

- Steam for space cooling and domestic water heating for use in buildings will be supplied by steam generated at the Medical Center Steam plant/Co-generation Facility. Steam is generated at a pressure of 140 psig saturated with a superheat of approximately 50 degrees. Distribution is via steam tunnel, shallow tunnel or direct buried pipe. All steam piping shall be schedule 40 carbon steel pipe. All condensate return piping shall be schedule 80 carbon steel pipe. All joints shall be welded. No flanged fittings shall be allowed. The University Office of Capital Planning and Project Management should be consulted in each case for availability and approval.
- Condensate from all uses within a building must be discharged using steam powered condensate pumps at the building into a pressure return main against a head of not less than 50 psig. Any underground high pressure steam line must be trapped and traps are to be accessible in a steam pit with removable cover. Any high pressure traps discharging into a condensate return line must have velocity eliminators in the line to prevent hammering and potential damage to the condensate return line. Traps shall be inverted bucket design. Consult with The University Office of Capital Planning and Project Management regarding specific discharge pressure for each project.
- In the event the underground steam service is not designed by the consulting engineers for the steam distribution system, the following standards will be applicable to the associate architects:
 1. Sketches and preliminary specification data pertaining to the branch connections to tunnels and tunnel mains must be presented to the University for reviews as soon as possible in order that such designs may be reviewed and approved by The University Office of Capital Planning and Project Management.
 2. The design of the underground steam service is not to be incorporated in the working drawings and specifications until such preliminary sketches and specifications have been approved by The University Office of Capital Planning and Project Management.
- Installation of steam and condensate piping to buildings shall be in concrete shallow or deep tunnels. The shallow tunnels shall be provided with accessible-removable covers and may be installed so that the top of the tunnel is at grade or in a subsurface configuration. Tunnel to be completely drainable.
- Direct buried conduit system use must first be approved by the University and if allowed, shall have an outer 10 gauge minimum steel outer conduit of welded construction with factory applied polyurethane foam, having a density of 2.0 to 3.0 pounds per cubic foot. The insulation thickness shall be a minimum of 1 inch thick. The outer jacket shall be high density polyethylene or fiberglass with a minimum thickness of 150 mils. Outer conduit shall be tested at 15 psig air pressure for at least four (4) hours. Inner steam pipe shall be schedule 40 carbon steel. Condensate pipe shall be schedule 80 carbon steel.
- All welded joints on the inner pipe shall be sealed with a chromate heat and rust resistant paint and sectional insulation applied before the outer casing is assembled. Joints in the inner pipe of 2 inch size and smaller shall be of the socket weld type. Joints in the inner pipe 2-1/2 inches and larger shall be

of the butt weld type with internal welding rings. Inner pipe shall be tested hydrostatically at a pressure of 225 psig for a period of at least 3 hours. All tests of both the inner pipe and outer casing shall be witnessed by a representative of The University Office of Capital Planning and Project Management before the pipe trench is backfilled.

- Ample provision for expansion and contraction of both mains in the tunnel and the branch connections shall be made by means of loops or offsets. Expansion bellows or slip joints are to be utilized only where necessity dictates and if approved by the University.
- All valves in the underground steam and condensate service shall be as follows: Low pressure steam 2-1/2 inches and larger for pressures up to 100 psig. shall be cast steel, weld end, wedge gate valve for 150# steam service. All valves 2-1/2 inches and larger for pressures 150 to 300 psi. service shall be cast steel, weld end, wedge gate valve for 300# steam service. Valves 2 inches and smaller shall be forged steel, bolted bonnet, socket weld, globe valve for 600# steam service.
- Drip traps on underground steam and condensate service shall be forged steel, inverted bucket trap.
- Insulation: Insulation of steam and return inner pipe shall be calcium silicate. Thickness of insulation shall be 1 inch for condensate return pipe, and 2 inches for high pressure steam up to 300 psig.
- Bedding for pipe shall be compacted coarse sand placed on virgin soil.

33 70 00 ELECTRICAL UTILITIES

- Primary Service Connections to Building:
 1. Facilities Management should be consulted for the primary electrical distribution voltage available on the Chicago Campus. In general, the primary electrical feeder cable for a building project shall be furnished and installed by that project. This shall include necessary switchgear, underground duct, high voltage cables, and electrical manholes. All primary electrical feeders routed inside a building shall be galvanized rigid steel conduit, properly bonded and grounded, and with high voltage warning signs.
- Source of Electrical Power:
 1. The campus owned distribution system on the East side of the Chicago campus is the required source of electrical power for all building projects. Special circumstances and remote locations, that incur excessive costs, may necessitate the use of service provided by the local utility.
- Service Entrance Pullbox:
 1. The primary service shall enter the building through a multi-cell concrete duct envelope in the basement wall and not directly into the unit sub-station. Provide a No. 12 gauge sheet steel pullbox over the ducts, see Drawings. Box size shall be determined by the number of ducts to be covered as well as the sizes of cables entering or leaving the box. The box shall have screw-on cover and shall be painted with two coats of gray enamel paint with "high voltage" stenciled on cover. The depth of box shall be a minimum of 9 times the diameter of the primary cable
- Special Requirements:

1. Extensions of the primary distribution system shall be part of the building design. Concept designs shall be reviewed by the University before proceeding, and special instructions will be supplied to govern this type of design.
2. Provide a single-line drawing showing the complete final building distribution system, suitably framed in 24" x 36" size under glass to be mounted in the substation or main switchgear room.

33 71 19 ELECTRICAL UNDERGROUND DUCTS AND MANHOLES

- Duct banks refer to utilities and not ventilation.
- See the Telecommunication Standard for underground requirements. <http://accc.uic.edu/policy/telecom-standards>
- Coordinate with University utility mapping archive program.
- Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated.
 1. Notify Architect and the University at least two (2) weeks in advance of proposed utility interruptions.
- Coordinate elevations of ducts and duct-bank entrances into manholes and handholes with final profiles of conduits as determined by coordination with other utilities and underground obstructions. Revise locations and elevations from those indicated as required to suit field conditions and to ensure duct runs drain to manholes and handholes, as approved by Architect and the University.
- Restore all areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary top-soiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with [Section 32 90 00 \(Planting\)](#).
- Building Entrances: Make a transition from underground duct to conduit at least 10 feet outside the building wall. Use fittings manufactured for this purpose. Follow the appropriate installation instructions below:
 1. Concrete-Encased Ducts: Install reinforcement in duct banks passing through disturbed earth near buildings and other excavations. Coordinate duct bank with structural design to support duct bank at wall without reducing structural or watertight integrity of building wall.
 2. Direct-Buried, Non-encased Ducts at Non-waterproofed Wall Penetrations: Install a Schedule 40, galvanized steel pipe sleeve for each duct. Caulk space between conduit and sleeve with duct-sealing compound on both sides for moisture-tight seal.
 3. Waterproofed Wall and Floor Penetrations: Install a watertight entrance-sealing device with sealing gland assembly on the inside. Anchor device into masonry construction with one or more integral flanges. Secure membrane waterproofing to the device to make permanently watertight.

33 71 19.13 ELECTRICAL MANHOLES AND HANDHOLES

- Manhole cover and frame shall be similar to Neenah Foundry Company, Neenah, WI, Series #R-1769-A. The cover and frame shall be constructed of gray cast-iron with a machine finished seat and shall be cast with the tag name "UIC ELECTRIC" in the top surface as indicated on the drawings.

This section of the Building Standards establishes minimum requirements only.
It should not be used as a complete specification