



01060

General Regulatory and Directive Standards

This document provides design standards only, and is not intended for use, in whole or in part, as a specification. Do not copy this information verbatim in specifications or in notes on drawings. Refer questions and comments regarding the content and use of this document to the Yale University Project Manager.

CONTENTS

- A. [Summary](#)
- B. [Project Documentation Requirements](#)
- C. [Occupational and Environmental Health](#)
- D. [Stairs, Steps, and Ramps](#)
- E. [Exterior Lighting](#)
- F. [Design, Construction, and Alteration for the Handicapped](#)
- G. [Submittals](#)
- H. [Project Document Inclusions](#)

A. Summary

1. This section identifies general plumbing, fire protection, HVAC, and electrical design regulatory and directive standards, codes, and references. It also contains general project documentation and occupational and environmental health guidelines, and identifies the desired quality, type, and characteristics of certain materials and facilities and the regulations and standards to be followed for the design of building systems.
2. The items contained in this section should be discussed during the development of each project. Use of this section and the other relevant sections listed in the following paragraph is intended to save time and help produce high-quality construction documents and buildings that provide a safe and healthy environment, are accessible to handicapped persons, are efficient to operate, and are compatible with existing operating and maintenance procedures.

B. Project Documentation Requirements

1. Specifications

Comply with the following specification requirements. Deviation from these requirements is not permitted without formal notice and Yale University's written approval.



a. Format

Arrange project specifications per the Construction Specifications Institute (CSI) MasterFormat,TM which arranges subjects in numbered sections within 16 established divisions. Precede these specifications with the general documents containing bidding documents and general conditions. Use of the CSI MasterFormatTM saves all users time and effort. This feature is important to an institutional owner. Therefore, the arrangement of specifications on Yale University projects by CSI division is mandatory, unless there is a valid reason for not doing so and that reason is approved by the University.

b. Practice

Unless policy is dictated by a funding agency, Yale University favors the following practices.

- (1) Submit performance specifications, or specify acceptable manufacturers (usually a minimum of three) and omit the term “or equal.”
- (2) Insert specific product approval standards under General Requirements, covering the following items:
 - (a) Where performance specifications are used, the Contractor is obligated, on request of the architect, to present an affidavit from the manufacturer certifying compliance prior to incorporation in the project.
 - (b) For approval of products other than those specified, a bidding contractor must submit a request in writing at least 10 calendar days prior to the bid date. Such requests must be accompanied by all of the data necessary to completely describe the item for conformance. The architect’s approval, after consultation with Yale University, must be in the form of a specification addendum to all prime contract bidders of record.
 - (c) The substitution of products will be approved after bids are opened only for such reasons as unavailability beyond the control of the contractor. Requests must be in writing, and substitutions must be accompanied by all of the data necessary to completely describe the item for conformance and by added cost or credit data. The architect’s approval, after consultation with Yale University, must be in writing.



- (d) Except in the instance of items beyond the control of the contractor, the contractor is be responsible for the space and fit requirements of approved substitutions.
- (e) Comments leading to revisions should be routed to the Office of Facilities Planning. The Office of Facilities Planning will record the names of all persons or firms to whom issue is made and will attempt to inform the recipients about changes. Users, however, should check periodically to be sure they have all revisions.

c. Language and Technology

When reviewing specifications, Yale University uses the CSI Manual of Practice and Specification Series. As an owner concerned with avoiding the defense of contingent liability lawsuits, the University expects the architect to pay particular attention to the language used in, and technology described by, the specifications.

d. Reproduction

Make single-sided reproductions of specifications to allow use of the blank side for attaching addenda and bulletin items and for annotations by users.

e. Shop Drawings and Samples

Each specification section should state if shop drawings and samples are required. If required, state the required quantities if not spelled out in the general documents.

2. As-Built Drawings and Documentation

As-built drawings and documentation required of the mechanical engineer or contractor must be reviewed by the engineer.

- a.* Revise as-built drawings and documentation to reflect modifications made to any part of the facility or mechanical systems.
- b.* Carefully monitor and document any change in usage, installed equipment, loads, or occupancy.
- c.* Drawings must be compatible with the CADD platform specified in *CADD Requirements for Outside Consultants*. Each mechanical drawing must contain all layers listed therein, whether or not actually used.
- d.* Operation and maintenance manuals should include a copy of the Testing and Balancing Report.



3. Working Drawings

All persons using the drawings are sensibly interested in using them easily and with the least waste of time and effort. Obviously, good drafting and lettering are a requisite quality, but the arrangement of information is just as important. Some desired arrangement features that should be incorporated in the drawings are described in the following paragraphs.

a. *Size and Scale*

Sheets should not be larger than 30" H x 42" L. The preferred scale for all overall plans and sections, except where very limited work is shown, is 1/4" - 1'-0". To avoid a conflict in these requirements for larger buildings, use multiple sheets with suitable match lines.

b. *Numbering*

An attempt should be made to have drawing numbers, such as SB, B, 1, 2, 3, 4, 5, show plans for sub-basement, basement, 1st, 2nd, 3rd, 4th, and 5th floors. A logical extension of this scheme involves P, M, and E prefixes to these numbers for the appropriate mechanical and electrical floor plans. Drawing numbers should be located in the lower right-hand corner of a title block appearing in the lower right hand corner of each drawing.

c. *Room Designation*

Rooms should be designated on plans by name, as well as room number, per Yale University Standards and Guidelines, Central Campus Room Numbering Standards. Room numbers are important. They should be approved before the design development phase and remain unchanged.

d. *Room Finish and Painting Schedules*

Locate individual floor schedules on the same sheet as the associated floor plan.

e. *Drawing Index*

In addition to the complete face sheet index, repeat a partial index on other drawings. For example, on plan drawings the local index should refer to sheet locations for items most wanted when looking at the plans.



Example:

<u>Item</u>	<u>Dwg. No.</u>
Equipment schedules	10
Plumbing details	14
Lab. equipment details	35

f. *Standard Abbreviations List*

The face sheet should include a list of all standard abbreviations.

4. Project Document Inclusions

a. Place the following note in bold type on each MEP sheet:

All control boxes, valves, control valves (of every type, shape, and function), and DDC control boxes must be installed in such a manner as to be fully and reasonably accessible and free from insulation or other construction components. Fully and reasonably accessible is defined as capable of being accessible for repair or replacement by an average-size individual, on a ladder if necessary, and capable of being removed without removing other components of the work.

b. Statements similar to the following should be included on drawings or in a specification section on special requirements for mechanical and electrical work:

- (1) *Mechanical and electrical drawings show pipe, duct, and conduit runs, and the locations of equipment, valves, panels, and other components. Dimensions not shown must be obtained from the architect, and not scaled from the drawings. Lay out routing and locations to meet field conditions, to provide easy access for service and maintenance, and to avoid conflict between the work of all trades. Submit proposed routings and locations to the architect for approval, and modified or relocate them within reasonable limits, as directed, without extra cost.*
- (2) *Provide equipment and apparatus complete with all the usual and necessary fittings and accessories not normally shown or specified, but which are required for proper installation and operation. Place gauges, thermostats, thermometers, and other accessories, not specifically located on the drawings, where directed by the architect.*
- (3) *Provide written operating and maintenance instructions for all equipment and systems, in approved form, to the architect before final acceptance of the work.*



- c. The architect is expected to design spaces housing equipment so that the actual layout, when complete, will allow Yale University to service the equipment. Include a statement similar to the following so the contractor is cautioned about this feature:

Locate all equipment and accessories to provide easy access for proper service and maintenance. Install equipment and accessories to enable the removal of any part without the need to remove other components.

C. Occupational and Environmental Health

The Division of Occupational and Environmental Health of the Yale University Health Service has responsibility for all occupational health and safety provisions in and around Yale University buildings. Through the Office of Facilities Planning, make arrangements for conferences and consultation with the Division Director and such section directors as indicated by the nature, contents, and occupancy of the particular project.

1. General

The Division of Occupational and Environmental Health Services (DOEHS) of the Yale University Health Service is responsible for the formulation of safety guidelines and conduct of other such activities as to promote the general health and well-being of the University community. The Division is concerned with matters pertaining to exposures to potentially hazardous biological, chemical or radiological agents; to the establishment of a relatively safe work environment; and to provide health services for conditions arising as a result of employment.

2. Consultation Services

The DOEHS provides consultation services through its several sections for specific questions or problems dealing with health and safety issues. These consultations, considered essential components of any construction project, should be requested and completed at the schematic design stage of the project. The nature of the project should lead to the forwarding of consultation requests to one of the following DOEHS sections:

a. *Biological Safety*

Review new construction, renovations, or alterations involving any facilities in the areas listed below with the Director, Office of Biological Safety, University Health Services. Before designing Class P3 or DCD3 laboratories, review the Yale University checklist for design of these areas. This checklist may be

Yale University Design Standards

Section 01060: General Regulatory and Directive Standards



obtained from the Department of Architectural and Engineering Services.

- Medical School
- Kline Biology Tower
- Any other area where work with infectious agents is conducted
- Any area where animal experiments are conducted

b. Environmental Health

The following principal areas impact environmental health and sanitation. Projects that include these areas should be reviewed by the Environmental Health Office.

- Food service, storage and/or processing facilities
- Swimming pools
- Potable water systems
- Solid waste handling (garbage and rubbish)
- Dormitory facilities
- Sewage disposal at off-campus sites

c. Occupational Safety

The Safety Department is concerned with the establishment and maintenance of a safe work environment, and is responsible for ensuring compliance with OSHA regulations. The following list of areas of interest is not all-inclusive, but serves as an example of the areas covered by OSHA for which construction plans should be reviewed. Questions concerning other areas not on this list that might also be covered by OSHA should be directed to the department's Occupational Safety section.

- All laboratory facilities
- Walking and working surfaces
- Ventilation systems
- Fume hood systems
- Stairways
- Shop facilities
- Storage facilities
- Electrical services
- Plumbing services



d. Radiation Safety

New construction or renovations to any of the following facilities, systems, or components should be reviewed to ensure incorporation, during the early design stages, of sufficient engineering controls for radiation protection purposes. The list is not all-inclusive, but serves as an example of the types of plans that might need review.

- Research laboratories
- Clinical laboratories
- Patient care facilities (including radiation services)
- X-ray facilities
- Accelerator laboratories
- Laser facilities
- Microwave facilities
- Ventilation systems
- Drainage systems
- Shielding
- Shielded facilities

D. Stairs, Steps, and Ramps

In addition to conformance with the State of Connecticut Building Code or other code requirements, consider the following:

- Facilities for the handicapped
- Adequate exterior lighting, as well as interior features
- Barriers at changes in levels (exterior and interior) where persons, including children, can fall from one level to another

E. Exterior Lighting

In addition to lighting at exterior stairs and steps, consider the amount and type of other exterior lighting. Discuss with Yale University the need to coordinate design with the University master plan for lighting of exterior spaces.



F. Design, Construction, and Alteration for the Handicapped

1. Under Section 504 of the Rehabilitation Act of 1973 all new construction must be barrier free and, in the case of additions and/or alterations, the renovated or added areas must be made accessible “to the maximum extent feasible.”
2. Design, construction, and alteration must meet the guidelines in ANSI A117.1, Specifications for Making Buildings and Facilities Accessible to, and Usable by, Physically Handicapped People, published by the American National Standards Institute, unless other methods clearly provide equivalent access.
3. In addition, Article 21 of the State of Connecticut Building Code makes mandatory certain provisions for the handicapped that are more stringent than the guidelines of ANSI A117.1. The provisions of Article 21 are mandatory for all new construction. For alteration projects, the provisions are mandatory by code where the costs of construction exceed 50 percent of the current replacement value of the building and might be made mandatory in cases where the costs exceed only 25 percent of the replacement value.

G. Submittals

1. Contract documents are often produced at the last minute. If the contract award is based on competitive bidding, document review and coordination often occurs during the bidding period, which generates numerous bidding period addenda and costly errors. This last-minute document review and coordination results from a document completion target date that is usually the out-to-bid or bid-due date. To avoid these problems, Yale University has adopted a policy of creating an earlier target date. An advance printing of all contract documents is expected one month earlier than the:
 - Out-to-bid date, if the award is based on bidding
 - Contract signing date, if the award is based on negotiation
2. Yale University realizes that the size of the proposed building might not justify the one-month advance date, and that in award-by-negotiation situations, such an advance date might not be feasible. However, the advanced target date will hold unless a departure agreement becomes a matter of record. See the Yale University Guidebook for New or Remodeled Building Construction: General Conditions, Division 1, General Requirements regarding the early submission of proposed General Conditions, Supplementary General Conditions, and General Requirements.



H. Project Document Inclusions

1. Include under General Requirements in the specifications, such statements as the following:
 - a. *Until construction is complete, protect all equipment from water, dirt, and physical damage.*
 - b. *Cover pumps, fans and similar equipment with tarpaulins or heavy plastic to protect bearings, motors, couplings, and other such components from weather and dust.*
 - c. *Do not use mechanical equipment as scaffolding or working platforms for other trades (painters, plasterers).*
 - d. *Upon completion of construction, chipped or scratched factory-finished equipment must be "touch-up" painted by the painting contractor at mechanical contractor's expense.*
2. Place the following note in bold type on each MEP sheet:

All control boxes, valves, control valves (of every type, shape, and function), and DDC control boxes must be installed in such a manner as to be fully and reasonably accessible and free from insulation or other construction components. Fully and reasonably accessible is defined as capable of being accessible for repair or replacement by an average-size individual, on a ladder if necessary, and capable of being removed without removing other components of the work.