

DESIGN STANDARDS

YSM APPENDIX

Section II. Divisions 1 - 14 (Revised April 01, 2013)



Yale University – School Of Medicine
Facilities Construction & Renovation

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CHANGE HISTORY

Date	Description of Change	Pages / Sections Modified	Change Approver Initials
4/1/13	Changed the link to access the design standards used by the Facilities website (Facilities.Yale.edu). Also changed the link to have page 66 displayed when the document is accessed.	1 – Index, Division I: General Standards, “Sustainable Design Requirements” link.	GC

DIVISION 6: WOOD & PLASTICS

06200 FINISH CARPENTRY

HARDWARE:

Shelf Standards and Support: K&V 87.
Shelf Brackets: K&V 186 or 187.

FABRICATION:

Fabricate to AWI Custom Standards.

SHOP FINISHING:

Transparent Finish: AWI System Number, as indicated.
Grade: Custom.

Opaque Finish: AWI System Number, as indicated.
Grade: Custom.

06400 ARCHITECTURAL WOODWORK

WOOD CABINETS:

Grade: Custom

Wood Species for Exposed Surfaces:

- Project dependent (for transparent finish).
- Any close-grained hardwood listed in reference woodworking standard (for opaque finish).

Grain Matching:

Run and match grain horizontally for drawer fronts, vertically for doors and fixed panels.
Matching of Veneer Leaves: Book Match.
Veneer Matching within Panel Face: Running Match.

LAMINATE CLAD CABINETS:

Grade: Custom

Laminate Grade for Exposed Surfaces:

NEMA LD-3. Provide Grade: GP-50.
Thickness: 0.050", unless otherwise specified.
Edges: GP-50 (0.050", nominal thickness).

Laminate Grade for Cabinet Interior Surfaces:

Duralam; melamine 6-10 mil sheet rolled onto luan core plywood. Provide on all laminate clad casework cabinet interiors.

Laminate Backing Sheet for Non-Visible Surfaces:

LD-3 BK20 Backing Grade:
Undecorated plastic laminate. Provide backing under all counter tops and other non-visible surfaces so that a "balanced construction" between the non-visible and exterior/interior laminate casework exists throughout the casework project.

SHELVING:

Core: 1" high density particle board or 1" plywood.

Finish: Heavy duty plastic laminate finish on all six surfaces. (Self edging materials on edges is okay.)

Span: Shelf standards at 30" o.c. maximum. (Wood blocking should be specified at all locations.)

ANCHORS:

Interior Masonry Walls:

Appropriately sized fiber/lead solid wall anchor, Rawl or equal. No plastic.

Hollow Wall Anchor:

Appropriately sized wing or metal expansion anchor (toggle or equal).

HARDWARE:

Drawer Slides: Premium quality, full extension, ball-bearing, nylon, double-track rated for 100 pound load in normal usage.

Locks:

- Where cabinet and drawer locks are required, use Best 5LX Hand, or Best 5E.
- Full ball-bearing carriers; zinc-plated steel #992ZC. Manufacturer K&V or equal.

DIVISION 7: THERMAL & MOISTURE PROTECTION

07000 ROOFING: GENERAL:

No single membrane roofing systems.

07300 ROOFING (SHINGLES):

Premium quality 240# or better, asphalt fiberglass shingle with a 20-year warranty.

07510 BUILT-UP ASPHALT ROOFING SYSTEMS:

ASPHALT (Steep Roofs):

- Manufacturers: Allied Signal
Koppers

07800 ROOF CURBS

Custom, as drawn, NOT PREFAB. See attached details.

ROOF ACCESSORIES

MATERIALS – METAL:

- | | | |
|----|--------------------|--|
| A. | Zinc-Coated Steel: | Commercial quality with 0.20 percent copper, ASTM A525, G90 hot-dip galvanized, mill phosphatized. |
| B. | Stainless Steel: | AISI Type 302/304, ASTM A167, 2D annealed finish except as otherwise indicated, temper as required for forming and performance. |
| C. | Aluminum Sheet: | ASTM B209, alloy 3003, temper as required for forming and performance; A-C22A41 clear anodized finish, except mill finish prepared for painting where indicated for field painting. |
| D. | Extruded Aluminum: | Manufacturer's standard extrusions of sizes and general profiles indicated, alloy 6063-T52; 0.078" minimum thickness for primary framing and curb member legs, 0.062" for secondary legs, AA-C22A41 clear anodized finish on exposed members, except as otherwise indicated. |
| E. | Copper: | Thickness, 20 gr. typical. |

07900 SEALANTS

No two-part sealants.

DIVISION 8: DOORS & WINDOWS

08100 STEEL DOORS AND FRAMES

MATERIALS – GENERAL:

- A. Exterior Doors: Hope or Critall with Tenamec paint, color: Luminescence #PA06.
- B. Gauges: Interior Frames: 16 gauge
Exterior Frames: 14 gauge
Exterior Doors: 16 gauge
Interior Doors and Panels: 18 gauge
Work not otherwise specified: 14 gauge
- C. Frame Fabrication: Fabricate with corners coped or mitered to hairline accuracy with all face joints continuously welded from outside and ground smooth. Weld the entire seam (including the seams between head and jamb rabbets, stops and soffits) from the backside, with a continuous weld bead. If weld penetration occurs, file smooth and finish all joints flush and smooth to produce invisible connections. Attach spreaders to frames.
- D. Anchors: Adjustable corrugated wedge type, 16 gauge minimum, at all masonry openings; and 16 gauge minimum manufacturers standard anchors, at all other partition and wall types.
- E. Inserts, Bolts, and Fasteners: Manufacturer's standard units, except hot-dip galvanized items to be build into exterior walls, complying with ASTM A153, Class C or D, as applicable.
- F. Reinforcements:
1. For surface applied hardware, 12 gauge plate or 14 gauge formed section.
 2. For lock, strike, and flush bolt reinforcement, 12 gauge plate or 14 gauge formed section.
 3. For hinge, 7 gauge.
- G. Glass Moldings: 20 gauge.
- H. Louvers: 18 gauge frame and 20 gauge blades.
- I. Silencers: 3 at single door strike jambs; 2 at head of pair doors (except at weather-stripped frames).
- J. Plaster Guards: Provide 26 gauge steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation, and to close off interior of openings.
- K. Primer: For non-galvanized steel, primer shall be manufacturer's standard rust-resistant metal primer. For galvanized steel, primer shall be zinc dust-zinc oxide primer or other primer certified by manufacturer for excellent adhesion to galvanized steel.

MINIMUM FRAME ENFORCEMENTS:

- A. General: For surface applied items, use 12 gauge plate-type reinforcement, width and length as required, tacked or spot welded in place, and the following minimum reinforcement for other items.
- B. Hinges: 3/16" X 1-1/2" X 9" with at least 3 electric spot welds staggered at each end. Supply full width or angle type hinge or pivot reinforcements at 14 gauge frame locations.
- C. Pivots: 7 gauge. Size per manufacturer's template recommendations.
- D. Strikes: 3/16" X 1-1/2" X 3" with at least 3 electric spot welds staggered at each end.
- E. Surface Holder/Closer: 12 gauge sleeve type reinforcement, 20" minimum length tacked or spot welded in place for application of holder/closer at any time on all frames not otherwise equipped.
- F. Mortise Holder/Closer: Minimum of 7 gauge. Size per manufacturer's template recommendation.

DOOR FABRICATION:

- A. General: Fabricate:
 - 1. Without seams on door faces.
 - 2. With seams on vertical edges welded and ground smooth.
 - 3. With closed flush tops
 - 4. With recessed channel bottoms to receive specified hardware and weather-stripping.
 - 5. With specified core laminated construction, and with all voids filled for each core type.
 - 6. Coordinate with frames to provide maximum margin (clearance) of 1/8" at heads, jambs and meeting stiles of pairs of doors, and 3/8" (1/4" at pairs) from finish floors, sills or thresholds to bottom of door, unless noted or detailed otherwise.
 - 7. Construct all doors to permit cutting 1/2" off bottom in field. Provide bevel on swing side.

MINIMUM DOOR REINFORCEMENT:

- A. General: Reinforce for the following items. Use 14 gauge spot welded plates for all surface items and those not otherwise specified.
- B. Hinges: 3/16" X 1-1/2" X 9" with at least 3 electric spot welds staggered at each end.
- C. Floor Hinges and Pivots: Minimum of 7 gauge. Size per manufacturer's template recommendation.
- D. Mortise Lock: 3/16" X 1-1/2" X 2" lock front; with centering clips for lock case alignment escutcheons or roses.
- E. Cylindrical Lock: 3/16" X 1-1/2" X 2" for lock front and two welded-in face support clips similar to Schlage 37-014.
- F. Flush Bolts: 14 gauge. Size per manufacturer's template recommendation.

- G. Exit Devices: 14 gauge. Size per manufacturer's template recommendation.
- H. Surface Door Closers: 12 gauge channel-type reinforcement, not less than 4" high X 18" long with not less than 8 electric spot welds for application of door closers at any time on all doors not otherwise equipped.
- I. Mortise Door Closers: 12 gauge channel-type reinforcement per manufacturer's template recommendation. Mortise type reinforcing channel to receive holder in a snug fit.
- J. Overhead Holders and Stops: 12 gauge channel-type reinforcement per manufacturer's template recommendation. Mortise type reinforcing channel to receive holder in a snug fit.
- K. Pulls and Pull Bars: 14 gauge plate-type reinforcement for concealed fastening and 12 gauge channel-type for thru-bolt mounting.
- L. U. L. Labels: Provide on both doors and frames where indicated. Unless otherwise scheduled, "B label" shall mean "1-1/2 hour B label". Cores shall be as required for U.L. label. Doors and frames shall conform to the requirements of ASTM E152, including time-temperature curve performance.
- M. Rubber Silencers: Provide on interior frames, installed before frames are filled with mortar. If U. L. listing does not include silencers for labeling doors, omit silencers.
- N. Shop Primer: One coat baked-on rust inhibiting primer, compatible with finish paint, for all steel surfaces.

08200 WOOD DOORS

- A. Solid Core Doors with Wood Veneer Faces: Premium quality veneer face, Algoma Hardwoods, Inc. Weyerhaeuser Co. or equal.
- B. Solid Core Doors for Transparent Finish:
Grade: Premium
Construction: PC-7, SLC-5, or SLC-7
- C. Fire-Rated Doors:
Algoma Hardwoods, Inc.
Eggers Industries
Weyerhaeuser Co.

08305 PANEL ACCESS DOORS

STEEL ACCESS DOORS AND FRAMES:

Fabricate units of continuous welded steel construction, unless otherwise indicated. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of support shown.

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FRAMES:

Fabricate from 16 gauge steel.

FLUSH PANEL DOORS:

Fabricate from not less than 14 gauge sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees. Finish with manufacturer's factory-applied prime paint.

LOCKS:

Flush screwdriver operated with case-hardened steel cam. Provide a "BEST 5L7RD3" interchangeable core lock for all locks. Yale University will provide the final core.

08700 FINISH HARDWARE (Change #26 10/1/2006)

FINISH:

626 OR 613 standard. Any deviation from this to be approved by Project Manager.

HINGES:

1 ½ pair butts per leaf, unless door is oversized. Include manufacturer's lifetime guarantee.

INTERIOR DOORS:

3'-0" or less wide, without closer; FBB 179 4 ½ " X 4" .
3"-0" wide or greater (or less than 3'-0" with closer); FBB 168 4 ½: X 4 ½".

LOCKS & LOCKSETS:

Manufacturer: Best

A. Locksets with lever handle trim shall be as follows:

Cylindrical Locksets: K Series.
Backset: 93K
Core Housing: 7 (NOT 6!)

Function Code: (Typically used)

Corridor AB
Stockroom D
Classroom B
Dormitory T
Passage N
Exit Y

Electronically Locked (fail safe): DEL

Lever Style: 14
Rose Style: K
Strike Package: Standard
Finish: 626 (satin chrome plated)
Fire Rated: As Required

B. The above will be used in all locations except where specifically required for non-handicapped accessible applications (i.e., janitor rooms, closets, utility rooms, et cetera). For the latter, the following will be used.

Cylindrical Locksets: 93K
Backset: 2 ¾"
Core Housing: 7

Function Code: (Typically used)
Corridor Lock: AB
Stockroom Lock: D

Knob Style: 4A (Tactile)
Rose Style: D (Convex)
Strike Package: Standard
Finish: 626 (satin chrome plated)
Fire Rated: As required.

DOOR CLOSERS (**Change #26 10/1/2006**)

- A. General: No concealed or floor-mounted closers.
- B. Interior Doors: Sargent 281 series for use with doors 6" deep door top rail per YSM Design Standards
New Inswinging door in either new or existing frame:
Sargent 281 Series Powerglide Closer
New outswinging door in either new or existing frame:
Sargent 281 Series Powerglide Closer, Top Mount with 281 Mounting Plate. This uses the standard closer but mounts it on the door frame instead of the top rail of the door. *To be Installed flush with the bottom of the door frame.*
- C. Exterior Doors and Heavy Use:
LCN "Super Smoothie" Series

FLUSH BOLTS:
Manufacturer: Sargent 3450 12".

SADDLES:
Manufacturer: Pemko 169A, or equal, from American Abrasive Metals Co.

- A. Provide 3" extruded aluminum saddle on exterior doors. Set in full bed of grout and mastic.

EXIT DEVICES:
Manufacturer: Sargent Co., Walter Kidde Co., Von Duprin, Inc.

FIRE/SMOKE DOOR CONTROL DEVICES:
Manufacturer: Appropriate LCN device or equal.

HINGES-GENERAL:
Provide premium quality full ball-bearing hinge Stanley 179 FBB or equal in appropriate finish.

KICKPLATES(Change #39 1/30/2009),

: Stainless Steel

Type 1: 34" high. For doors exposed to frequent passage of tank dollies and carts
Type 2 16" high. For typical lab doors
Type 3 4" high For door surfaces facing composition floors
(no kick plates to be used facing carpet)

Other dimensions than above may be used to relate to existing conditions if approved by YSM FC&R PM.

WEATHERSTRIP: Zero #555A / # 555 G or
PEMKO 379 series

OTHER REQUIREMENTS:

- A. 7 pin throws should be taped to door handle when installed to facilitate Yale keying effort.
- B. Give BS&O all old locks to use for spare parts.
- C. When retrofitting existing doors, use "dutched up" door rather than metal plate (install "dutchman")

DIVISION 9: FINISHES

09250 GYPSUM DRYWALL (change #32 1/22/2008))

STEEL STUDS

General: Steel framing system.
Gauge: Minimum 20 gauge studs.
("dimpled" steel studs are acceptable alternative if installed in full conformance with manufacturer's recommendations and of strength equivalent to 20 gauge conventional studs)

TYPES OF GYPSUM BOARD:

Thickness: 5/8" unless otherwise specified.

09510 ACOUSTICAL CEILINGS

GRID/TILE:

At Corridors,
Offices,
Conference
Rooms & Labs: **(Change #49, 10/30/09)** Armstrong Ultima tegular fine texture
2x2 high recycled content (1911 HRC) with 15⁹/16" grid.

General: No concealed spline systems are to be used, anywhere.

At Wet
Locations: **(Change # 37, 12/15/08)** Preferred tile – Armstrong #605
Travertine Ceramaguard.

09650 RESILIENT FLOORING

Materials:

RUBBER TILE (Change #38,12/15/08)

Manufacturer:
Nora Rubber Flooring

Product:
Norament 925 Grano

Color:
1238 Basalt

COMPOSITION TILE (Change #38,12/15/08): 12" x 12"
(VCT is no longer to be used at YSM unless approved by PM for special situations such as matching an existing condition)

Manufacturer:
American Biltrite

Product:
Estrie

Pattern:
Viera

Neutral field colors and accents:
Light (white): ALL-615 Cotton Tails
Medium (light gray): ALL-603 Granite Falls
Dark (dark gray): ALL-633 Polished Pewter

Accent colors:
At discretion of the designer, from entire Viera color collection.
Color(s) and pattern(s) to be reviewed and approved for each project.

Please note: for future flexibility (bench reconfiguration/removal), composition tile in laboratories shall not be laid out using bench locations to frame floor patterns, rather the lab flooring shall be all neutral field colors with color accents only near the perimeter of the space or shall be a continuous, undifferentiated pattern unrelated to bench locations. In addition, composition tile shall be continuous under all casework.

FILLED VINYL SHEET:

Limited to specific programmatic space, such as cold rooms and operating rooms; to be approved by Project Manager.

EXTRA STOCK:

Any extra stock to be turned over to Facilities Operations No specific attic stock is desired or required

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Floor Finish (Changed 9/1/2005):

Floors must be completely stripped, including all corners and edges, to remove all existing finish and soil before the new finish is applied

Recommended stripping technique and equipment are as follows: Spread stripper with a designated stripper mop and let solution dwell 3 to 5 minutes. Do not let the stripper dry. For large unrestricted areas, use a 20" diameter, corded scrubbing machine with a 3M system Black pad (or equivalent). For tight spots, use a 3M system Doodle Bug (or equivalent) and a scraper. Pick-up the slurry using a wet vacuum. After slurry pick-up, rinse the floor twice with a clean rinse mop using clean, clear water. Do not mix clean mop and stripper mop.

Four (4) coats of new floor finish will be applied as follows: Floor finish shall be applied with a new, synthetic finish mop, using SC Johnson, Time Saver. Apply Two (2) medium coats of floor finish, allowing sufficient drying time between coats (per manufacturer's recommendations). Wait 1-2 hours. Burnish the floor area using an ultra-high speed burnishing machine. Apply Two (2) more medium coats of finish, allowing sufficient drying time between coats.

Contractors are responsible for obtaining and providing all supplies directly from Yale University established vendors. The Eastern Bag and Paper Company is an established vendor for Yale and may be utilized for obtaining the necessary supplies. Jack Durso is the sales representative for all Yale accounts. His cell phone number is 1-203-915-4933.

09670 WALL FINISHES (Change #43, 6/15/09)

Linoleum Sheet Wainscoting

Provide Forbo Marmoleum Linoleum Sheet Flooring manufactured by Forbo in color selected by architect from the range currently available from Forbo 78" wide wide x 105 feet long, having a nominal total thickness of 0.080in. (2.0mm). The wear surface shall consist of a homogeneous mixture of linoleum cement (linseed oil, natural tree resins, drying oil catalysts), wood flour, cork flour, color pigments and filler calendared onto a jute fabric backing. Colors and pattern detail shall be dispersed throughout the thickness of the wear layer.

09680 CARPET (Change # 36, 1/22/2008)

A. General

Carpet mills must have five or more years of production experience with carpet similar to type specified in this Section. Product must be compliant to stated requirements in this section.

B. Acceptable Manufacturers

Bentley Prince Street
Lees
Karastan-Bigelow-Mohawk
Shaws

C. Minimum Construction Criteria

1. Broadloom

- a. Construction: tufted
- b. Surface texture: textured loop, tip-sheared or cut and loop blend
- c. Gauge: 1/10"
- d. Stitches: 8.5 per inch
- e. Face yarn: Antron Legacy Nylon
- f. Face yarn weight: 24 oz minimum if total weight is over 75oz

2. Tiles

- a. Construction: tufted
- b. Surface texture: textured loop, tip-sheared or cut and loop blend
- c. Gauge: 1/10"
- d. Stitches: 8.5 per inch
- e. Face yarn: Antron Legacy Nylon
- f. Face yarn weight: 32 oz

D. Minimum Performance Criteria

1. Flammability: Passes DOC-FF-1-70 Pill Test
2. Floor Radiant Panel Test: Meets NFPA Class 1 when tested under ASTM E-648 glue down
3. Smoke Density: MBS Smoke Chamber NFPA-258-Less than 450 Flaming Mode
4. Static: Less than 3.0 KV when tested under the Standard Shuffle Test
5. Warranties: Lifetime of Carpet under normal use for wear, static, edge ravel, de-lamination and tuft binding
6. Color Fastness: no change in color from sun light

E. Specialty Backing

Areas where specialty backing is required i.e. clinic and healthcare facilities to be specified with properties that conform to the specific need of water barrier or durability.

F. Minimum Environmental Footprint Standard **(Change #36,1/22/2008)**

Broadloom and carpet tiles are to be CRI Green Label Plus certified. If this certification is not available provide documentation on the recycled content of the product and the carpet data on low emitting materials

G. Installation Guidelines

Carpet must be installed to conform to the CRI 104-1996 Standard for Installation Specification of Commercial Carpet and Guidelines for Indoor Air quality. Carpet will be direct glued using waterproof, non- VOC emitting, strippable adhesive recommended by the manufacturer.

Carpet tiles to be free-laid.

Termination and transition strips to be specified for approval in the specification package.

Contractors must provide a seaming diagram for approval for all pattern broadloom carpet

H. Attic Stock

Contractors are to supply 2% minimum of each type of carpet and carpet tiles used on the project. Extra material to be in full width rolls if broadloom or boxed properly if tile.

i. Restricted Areas:

1. Heavy Traffic Areas: In academic buildings, carpet for corridors which carry heavy traffic is not generally recommended. However, a high density flooring, such as Power Bond, may be used.
2. Vending Areas: Omit carpet under vending machines and for a distance of at least six (6) feet in front of machines.
3. Cafeteria Serving Lines: Omit carpet in or near serving line area.
4. Lobbies: Omit carpet at entrance doors and for a distance of at least six (6) feet into the lobby.
5. Thresholds: Provide non-combustible thresholds under door with a fire rating of 45 minutes or greater.

09800 SPECIAL COATINGS

A. Floors in Animal Room:

- a) Dex-O-Tex – Chemert-K – "orange peel" finish
- b) Stonhard – "orange peel" finish

09900 PAINTING

1. General: No flat finish wall paint.

DIVISION 10: SPECIALTIES

10160 TOILET PARTITION (Change #51, 3/25/2010)

MANUFACTURER: Hadrian or equivalent if approved prior to submission of bid

MATERIALS: "Arch" polypropalene

COLOR One of the following, as appropriate to coordinate with other colors in the room

Bone 213
Military Grey 237
Slate 231

10400 IDENTIFYING DEVICES (Change #48, 8/10/2009)

Sign modules are to be specified and installed as part of any project. See Section VIII, Required/Typical Details, for mounting height and locations. Provide signage schedule as part of Construction Documents. See Section VIII for example of Required Sign Schedule.

Manufacturer: INNERFACE Architectural Signage, Inc., Liburn, Georgia

Source: Direct from manufacturer (or for small quantities, order through Signlite, Inc., 6 Corporate Drive, North Haven, CT 06473)

Sizes: Typical Room Sign (4½" x 4½")
YSM Sign types A, B & C
INNERFACE Module 2.0 (with custom right and left openings)

Typical Lab Safety Card Sign (4½" x 8¾")
YSM Sign types D&E
INNERFACE Module 5.5

Typical Recycling Center Sign (2¼" x 7")
INNERFACE Module 3.0

Plaque: Square corners with perimeter stripe.
Provide with matching removable insert (blank).

Color: INNERFACE, #3 Light Grey
Exception: If a project requires signs in a corridor or area with existing signs of another color that are not being replaced, then that color is to be maintained.

Room number: Raised characters; black, Helvetica Regular.
Note: At floors E (Entry Level), G (Ground Level) or B (Basement Level), the floor level designation is to be included in the room number. *Example:* G27
Provide Braille characters below the number.

Installation: See Section VIII, Required/Typical Details:
Sign Lettering Spacing Standard
Sign Locations
Required Sign Schedule format

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10800 YSM STANDARDS FOR TOILET ROOM ACCESSORIES (Change # 24, 10/1/2006)(Change #52, 5/13/2010)

Furnished by Yale's janitorial products vendor at no charge, except Feminine Disposal Units and, in some cases, air hand dryers. All accessories to be installed by the contractor:

Paper Towel Dispensers are not to be installed in new or renovated toilet rooms unless advised otherwise by the YSM Project Manager.

Air hand dryers to be Dyson Airblade AB04, 110-120V AC single phase 60Hz, with a polycarbonate ABS exterior casing. Consultants will locate these at the ADA required height.

Product information is available at

<http://www.dysonairblade.com/specification/default.asp?product=AB04-AIRBLADE>

The YSM Project Manager shall determine from Custodial Services if dryers are available for the project. If not they shall be purchase by the contractor.

Install 1 dryer for up to 3 sinks; 2 for 3 to 6 sinks etc

Toilet Tissue Dispenser Bay West # 80260 Opticore White side-by-side 2-roll tissue dispenser; key lock with universal key; 11 1/16"W x 8 13/16"H x 7 3/16"D- NO CHARGE
or

Toilet Tissue Dispenser Bay West # 80360 Opticore White 3-roll Round tissue dispenser; key lock with universal key; 14 1/8"W x 14 9/16"H x 6 5/16"D – NO CHARGE

Soap Dispenser: DEB SBS # 98127-1 Proline White Foam Soap Dispenser - 1-Liter Capacity; key lock with universal key; 5.125"W x 9.1875"H x 4.625"D – NO CHARGE. *Install 1 per sink. Additional dispensers may be needed in high volume areas – consult with YSM Facilities Operations Customer Service through the YSM Project Manager*

Toilet Seat Cover Dispenser: Kimberly-Clark #09505: Series-I Windows Personal Seat Cover; 2-pack; push-button access; white; 13.25"H x 17.5"W x 3.25"D – NO CHARGE

Feminine Disposal: Rochester Midland Corp #25032000: stainless steel; 11"H x 8"W x 4.25"D- provided at market price- Price as of August 2006- \$45.52 each

The vendors for the above products are:

Eastern Bag
200 Research Drive
Milford CT 06460
203 882 2852
800 972 9622

Paper towel dispenser

Toilet tissue dispensers- 2-roll and 3-roll

Foam Soap dispensers

Toilet seat cover dispenser

Feminine disposal

To be furnished and installed by the contractor:

Waste Receptacle: Brick #B-277; Contura series; surface-mounted; 20 ga. Stainless steel with satin finish; 12.75 gal; 23"H x 15.125"W x 8.5"D

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DIVISION 11: EQUIPMENT

11600 LABORATORY CASEWORK & EQUIPMENT (Revised 8/06)

CASEWORK STANDARDS:

- A. Countertops: (Color: Grey)
 - 1. Epoxy, or when authorized, acid resistant plastic laminate. (plastic laminate is only authorized in limited applications where there is little moisture and no caustic reagents)
 - 2. Epoxy reagent shelving at peninsulas.
- B. Acid resistant plastic laminate wall shelving on plywood. When acid resistant plastic laminate is authorized for counter tops, epoxy counter tops shall be used at sink cutouts and 2'-0" +/- on either side.
- C. Handicap adaptability of all lab bench to 30" height is required. All bench top joints to be silicone sealed to facilitate removal. (See Section VI Required/Typical Details)
- D. Laminate panel box chases are to enclose all piping from ceiling to bench top.
- F. Epoxy reagent shelving to be supported on 1 ½" X 11 ½" stock frames.
- G. In laboratories, when casework abuts existing radiator, drawer base and support panel at carrels are to be removable for access to adjacent radiator. This requires that drawer units and panels next to the radiator NOT be part of the support structure for the carrel.
- H. Provide locks at all carrel drawers, including drawers in adjacent lab bench if assigned to carrel. One key is to be used for all locks at a given carrel. NOT a different key per drawer.

DIVISION 12: FURNISHINGS

12500 WINDOW TREATMENT

VERTICAL BLINDS: Required at all exterior windows. Exterior color must be white.
Note: Any exception to this standard must be approved by the Executive Director of Facilities Development & Operations.)

PIVOT MECHANISM: Manufacturer's standard geared rotating mechanism providing full synchronous 180 deg. rotation for each louver blade. Cord linkages are not acceptable as rotating mechanism.

LOUVER BLADES: Manufacturer's standard louver blades.
Width: 3 ½"

DIVISION 13: SPECIAL CONSTRUCTION

13060 CONTROLLED ENVIRONMENT ROOM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Prefabricated, all metal clad construction furnished and installed as a complete self-contained unit and system, with all essential plenums, controls, balanced air circulation and all other equipment necessary to reach the environmental conditions specified herein.
- B. Factory assembled and tested major components, including air handler, condensing unit and control panel, prior to delivery.
- C. Delivery of room components to their final location, and complete assembly of rooms in place.
- D. Refrigeration piping, electrical power wiring, control wiring and connections, which are an integral part of the rooms.
- E. Installation of structures and fixtures supplied by room manufacturer.
- F. Start-up and field testing of rooms.

1.02 RELATED SECTIONS

- A. The General Conditions, Article _____, states that the Contract Documents are complimentary.
- B. Temporary facilities and controls are specified in Section _____. Cooperate in ensuring adequate protection.
- C. General material, equipment and workmanship standards are specified in Section _____.
- D. Division 15, Plumbing: City/DI water supply to boiler and sinks and open drain lines within the room. Laboratory gases and water services shall be provided for under this referenced section. All penetrations through the environmental structure required by this Section will be provided for by this Section including vapor seals. Coordinate with environmental room manufacturer.
- E. Division 15, Mechanical: Condenser water supply and return lines to water cooled condensing unit, including independent shut off valving. Ventilation air to air cooled condensing unit location adequate to maintain ambient conditions less than or equal to 90°F. Supply and exhaust make-up air as required in this section. Consult factory with ventilation concerns. 1/2" condensate drain line in the room shall be provided under Division 15.

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- F. Division 16, Electrical: Electrical services to room control panel and condensing unit contactors. A fused service disconnect switch must be provided as part of the condensing unit service. All penetrations through environmental room structure required by this Section will be provided for by this Section, including vapor seals. Coordinate with environmental room manufacturer.
Main electrical feeds and connection for control panel and condensing unit shall be provided under the work of Division 16. Typical Power Include:
- 208V/3 Phase/60Hz 20 AMP circuit to the remote condensing unit.
 - 120V-208V/1 Phase/60Hz 30 AMP to the room control panel.
 - 120V/1 Phase/60Hz 20 AMP to the light switch.
 - 120V/1 Phase/60Hz 20A () circuits to the outlets
 - Power drop as specified by the cold room manufacture for any dehumidifier equipment.
 - Environmental room manufacturer will submit room specific power requirements with room submittal.
- G. Section 07900 - Joint Sealers.
- H. Section 09650 - Resilient Flooring.
- I. Section 11600 - Laboratory Equipment
- J. Section 12345 - Laboratory Casework (Epoxy counter and shelves)

1.03 REFERENCES

- A. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

- A. See Section _____ - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate layout, room dimensions, materials, components, fasteners, doors, hardware, equipment, finishes, method of installation and assembly, panel placement, supplementary support or bracing, controls, and service rough-in.
- C. Product Data: Provide data on hardware and fixtures, joint details.
- D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code for noncombustible construction.

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- B. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

1.07 DELIVERY, STORAGE, AND PROTECTION

- A. Wrap and crate finished components and assemblies at factory to prevent damage or marring of surfaces during shipping and handling.
- B. Do not deliver materials or assemblies to site until installation spaces are ready to receive units.

1.08 PROJECT CONDITIONS

- A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- B. Scheduling and Coordination: The room installer shall examine project conditions at the site with regard to access, dimensions, conditions as they exist and the general areas of work, and shall perform work in such a manner as required to deliver, install and connect the rooms in close coordination with work of other trades.

1.09 WARRANTY

- A. See Section _____ - Closeout Submittals, for additional warranty requirements.
- B. All material and labor shall be warranted for a period of one year from date of installation. Any defects in material or labor shall be replaced or repaired without charge.
- C. The temperature and alarm controllers shall be warranted for a period of three years from date of installation.
- D. The refrigeration compressor shall be warranted for a period of five years from date of installation. (Compressor only.)
- E. The foamed-in-place modular panels shall be warranted for a period of 10 years from the date of original installation.
- F. During the one-year warranty period, service shall be available and supplied on a twenty-four hour per day, seven day per week basis. Service for the rooms and all of their components shall be the responsibility of the controlled environment room manufacturer.
- G. The controlled environment room manufacturer shall supply, if required, a maintenance contract on a yearly basis after the warranty period has expired.

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PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. To establish a standard of quality and design desired, the environmental room and accessories specified herein are based on Environair, a Division of Holman Engineering, Inc., Springfield, MA 01104, 413-731-8100
- B. Acceptable Manufacturers: Environair, a Division of Holman Engineering, Inc., Harris Environmental Systems, Conviron, Percival Scientific Inc., Forma Scientific, Environmental growth Chambers. Proposed substitutions must be approved by the owner in an addendum prior to bid date as specified in bidding requirements. Manufacturers who have not received prior approval will be unacceptable.

2.02 GENERAL DESIGN SPECIFICATION

- A. Rooms shall be pre-built, all metal clad sectional construction to allow for future expansion, addition or disassembly for relocation. Rooms shall be furnished as completely self-contained units and systems, with all essential ductwork, control systems, balanced air circulation and all the equipment necessary to perform the environmental conditions listed in this specification. Sections shall be so designed to permit passing through standard doorways without interference.
- B. Provide room dimensions as shown on drawings
 - 1. Finish interior height dimension: 6'8"
 - 2. Finish exterior height dimension: 8'-6 1/4"
 - 3. Room Number: _____
- C. Interior dimensions shall be considered as clear, usable dimensions, without any obstruction or appendages from ducts or equipment used to maintain controlled environments.
- D. The exterior height is shown as room height only. Equipment on top of the room may vary the dimensions and location depending upon the conditions to be maintained with the room.

2.03 ENVIRONMENTAL PARAMETERS

- A. Room Number: _____
 - 1. Temperature _____ (Cold rooms shall be Non-Condensing)
 - 2. Temperature Control: +/- .5 Degree C (Shall be referred to as the maximum variation at the control point.)
 - 3. Temperature Uniformity: +/- 2 Degree C (Shall be referred to as the temperature difference between two or more points as measured on a horizontal plane 40" AFF and within 12" of walls throughout the room. Uniformity shall be measured by a multipoint recorder over a 24hour period.)
 - 4. Relative Humidity: The cold room equipment shall be designed to provide non-condensing conditions in the room interior. (RH < 60%).

2.04 MATERIALS

A. GENERAL CONSTRUCTION

1. Room shell construction must have N.S.F. seal of approval. No others shall be acceptable. The foamed-in-place panels shall be warranted to be free from defects in material and workmanship under normal use and service for a period of ten years from the date of original installation by an authorized representative, but not to exceed ten years from the date of the original shipment.
2. No structural members shall be used between interior and exterior walls that have a thermal conductivity rating greater than that of the insulation.
3. Rooms shall be double-wall construction, with interior and exterior walls bonded together by foamed-in-place urethane.
4. Panel sections shall be sealed at joining surfaces with pure vinyl. Gasket shall provide a positive vapor seal after sections have been locked together.
5. Sections shall be locked securely together by cam locking devices.
6. All interior fasteners shall be stainless steel. All interior wireway, junction boxes, wire conduit pipe, and fittings shall be PVC material.

B. INSULATION

1. Urethane insulation with the following minimum properties shall be used.
 - a. Fire hazard classification according to ASTM E-84 (UL723) and is certified with UL label.
 - b. Each panel shall have an average in-place density of 2.25 lbs per cubic foot. The K factor shall average 0.1470 at 75°F mean temp.
 - c. Wall and roof sections shall be a minimum of 4" thick.

C. FINISH

1. The interior walls and ceilings shall be finished with 22 gauge Stainless Steel
2. Visible exterior walls shall be 26 gauge finished with white enamel on embossed galvalume.
3. The exterior walls shall be a minimum of 26 gauge embossed galvalume.

D. DOOR

1. The hinged entrance door shall have a thermoplastic gasket with a magnetic steel core mounted on the top edge and along both sides. The bottom edge of the door shall contain an adjustable rubber wiper gasket. Gaskets must be resistant to oil, fats, water, sunlight and shall be of the replaceable type.
2. The door shall have a minimum of two hinges, self-closing type, with stainless steel pins and nylon cam-type bearings.

3. The door latch shall have a cylinder lock and include an inside safety release to prevent anyone from being locked inside.
4. Heater wires shall be concealed behind the edge of the door jamb on all four sides for temperature below 0°C
5. The door shall be supplied with 14" x 14" multi-pane viewing window with seal separation between the panes to eliminate fogging.
6. Entrance opening shall be 36" wide by 78" high.

E. FLOOR

1. The floor sections shall be constructed of .100" smooth aluminum and shall withstand an even loading of 700 lbs. per square foot. Insulation shall be 4" thick with the same minimum properties as the walls.
2. The floor shall have formed coves at the interior base perimeter and four interior corners.
3. Floor sections shall be connected together and securely locked with cam locks. Double gaskets of pure vinyl shall be supplied to provide a positive vapor seal. The floor shall be sealed with a clear silicone silastic and shall be water-tight.
4. The floor covering shall be provided and installed under section _____ and as shown on the finish schedule.

2.05 CONTROL SYSTEMS SPECIFICATION

A. GENERAL

1. The control panel enclosure and components shall be manufactured according to UL508A standards for industrial control panels. The factory tested control panel shall be UL508A approved and labeled.
2. The control system shall contain all temperature electronic devices, load drivers and NEC overload devices in one control enclosure. This single control enclosure shall also contain the high/low temperature alarm system and the automatic defrost control system for all rooms designed for operating at 8°C or less.
3. A clear acrylic plastic hinged cover and lock shall be provided over the face of all controls to protect the system from damage and any unauthorized tampering with the controls. Alarm reset and alarm override push buttons must be operable from outside the locked acrylic access cover.

B. TEMPERATURE CONTROL

1. A solid state dual display, RTD feedback temperature controller shall be provided with .1°C readout resolution that will operate all temperature controlling load devices such as heating contactors and cooling solenoids.
2. The dual display temperature control shall simultaneously and continuously display the temperature set point and the process temperature.
3. An independent control circuit breaker and heater load circuit breaker shall be provided. Individual control switches for cooling and heating allow shall be provided.

C. HIGH LOW SAFETY TEMPERATURE ALARM

1. A redundant high and low temperature safety system shall be provided with a solid state dual display, thermocouple feedback alarm control. The temperature safety system will have an independent sensor and monitoring circuits separate from the main temperature control system. High and low safeties will also have redundant power relays, hot gas solenoids, and cooling solenoids from that used by the main control system to insure positive shut-off of the heating and cooling systems.
2. Individual high and low temperature indicator alarm lights will be provided along with form C contacts for remote monitoring. A common buzzer and silence system will be provided to give an audible signal of any alarmed condition.
3. The alarm circuits shall be continually active and may not be disabled by switches or push buttons. These circuits shall be of the automatic reset type whereby the normal controlling devices shall become operative whenever the temperature returns to within the safe operating range of the high/low alarm system.

D. DEHUMIDIFICATION EQUIPMENT

1. Cold rooms shall be non-condensing.
2. Dehumidifier equipment shall control non-condensing condition.
3. Dehumidifier to be refrigerant based reduced energy design, 120V/20Amp power drop. System located in the room mounted for easy access. Unit to be mounted on room ceiling or on shelf unit depending on room layout and shelving. Humidistat control with automatic defrost routines. Route condensate drain with room evaporator drain line.

2.06 CONDITIONING SYSTEMS SPECIFICATION

A. CIRCULATING SYSTEM

1. The circulating and conditioning systems shall be mounted to the room ceiling. The system shall contain all the necessary components to maintain the environmental parameters as called for with any listed loads.
2. Evaporator housing and drain pan shall be stainless steel. Evaporator coil shall be Electrofin polymeric E-coated. Remove orifice at inlet of coil. Coil at cold room ceiling needs to be a minimum of 12" away from cold room wall.
3. All wiring to heaters, valves, blowers, lighting fixtures and other electrical appliances located within the controlled environment room shall be contained within the air distribution plenum, to minimize penetrations through the room ceiling.
4. The air within the room shall be circulated continuously except for short periods of defrost on rooms operating below +8°C. The circulation system shall be designed with sufficient capacity to maintain the temperature uniformity parameters with the loads listed.

5. A drain pan shall be connected to the evaporator to collect condensation from the refrigeration coils. A nominal 1/2" drain line from the evaporator thru the room wall and connected to the building drain system shall be provided. White PVC pipe and fittings shall be used for this drain system.
6. A positive pressure ventilation port shall be provided with an adjustable 0-15 CFM fresh air make-up.
7. An exhaust outlet port shall be provided under this section. An indirect exhaust connection shall be provided by division 15.

B. REFRIGERATION SYSTEM

1. Single compressor system
 - a. The refrigeration system shall be of industrial design, and of sufficient size to handle all specified loads. The system shall contain a compressor with an oil level sight glass, inherent over-load protection, condenser receiver, solenoid valves, unloader valves, liquid indicator, filter drier, thermostatic expansion valves, cooling coil, etc. –
 - b. The condensing unit shall be water - cooled and shall use R-404A refrigerant.
 - c. The condensing unit shall be located in an equipment room near the cold room.
 - d. When the refrigerant piping runs are within 30', the condensing unit shall be hermetic. When the refrigeration runs are longer than 30' the condensing unit shall be semi-hermetic.
 - e. Water-cooled condensers shall be supplied with a water regulating valve and an automatic reset high-low pressure compressor cut-out. Install the condensing unit with cork and rubber vibration pads.
 - f. CAP tubes, High pressure control and water regulating valve CAP tubes to have a shut off valve for ease of replacement without reclaiming refrigerant. Silicone CAP tubes for vibration elimination.
 - g. Horsepower of compressor shall depend upon the room size and load requirements.
 - h. The refrigeration system shall run continuously, with the main control operating specially designed cooling and by-pass rapid cycle solenoid valves.
 - i. Refrigeration solenoid valves shall be located near the coil and easily accessible from within the room. Avoid locations above counter tops and near shelving units when possible.
 - j. Full port ball valve shutoff vales shall be installed ahead of solenoid valves to facilitate maintenance.
 - k. Expansion valve, solenoids, filters, site glass, ETC... shall be solder type, no flares.
 - l. Piping runs shall be hard copper type, ACR, hung with unistrut and hydrosorb soft clamps. Piping shall be brazed, not soldered. Control components like, CROT's, TXV and Solenoids, etc that may need to be replaced may be soldered.

- m. System to be leak-checked at 150 psi with nitrogen for a minimum of 3 days before acceptance of system.
- n. Set High pressure control for auto reset and low pressure control at 2 psi
- o. A hot gas defrost system with automatic timer shall be supplied for rooms where practical. Electric defrost shall be used on rooms operating below -10°C. A defrost cycle indicating light shall be located on the control panel. During defrost, control tolerances may be exceeded for short periods of time.

C. LIGHTING SPECIFICATION

- 1. Rooms operating from 0°C to 25°C shall be provided with rapid-start fluorescent lamps. Lamps will give uniform lighting of 70 foot candles at a bench height of 40"
- 2. Rooms operating below 0°C shall be provided with vapor proof incandescent lamps or low-temperature fluorescent lamps with remote ballast.
- 3. A switch for interior lights shall be located next to the door on the latch side.

D. HEATING SYSTEM

- 1. Rooms operating above ambient shall be provided with a heating system. The heating system shall use stainless steel tubular finned low watt density heaters. The heating system shall have the capacity to maintain maximum temperature while operating in a safe, black heat.
- 2. Heaters shall be located in the conditioning housing to eliminate any radiational effects that would tend to upset the uniform temperature conditions. The locations shall also ensure proper mixing of the conditioned air before entering the room.

E. CIRCULAR CHART RECORDER

- 1. Temperature Recorder
Honeywell Recorder Model #4301GP Single Pen 10" circular chart with 24-hour or 7-day chart speed.
- 2. Temperature Humidity Recorders
Honeywell recorder Model #4302GP 10" circular chart with 24-hour 7-day chart speed. Two pen recorder for recording temperature and % RH direct.

F. ELECTRICAL OUTLETS

- 1. Non-metallic raceway 4 1/2" wide with 120 volt duplex outlets on 24" centers shall be mounted on the interior walls. Outlet wiring will terminate in a junction box on top of the room.

G. THROUGH-WALL PORTS

- 1. Through-wall ports shall be field installed as directed, to handle accessories such as air, gas, and water drain lines.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces, prepared openings, and roughed-in utilities are ready to receive work and opening dimensions are as indicated on shop drawings.

3.02 INSTALLATION

- A. Assemble and install components in accordance with manufacturer's instructions.
- B. Cut holes, install anchors, and seal room panels for plumbing, power, and lighting.
- C. Assemble wall panels; lock in place with cam locks. Brace securely until ceiling panels are installed.
- D. Install ceiling panels; lock into wall panels. Provide and install supplementary ceiling hanger supports to building structure above if necessary.
- E. Hang doors. Adjust to operate smoothly.
- F. Install ceiling trim and ceiling fascia, cover plates between top of room and finished ceiling and end closure plates between room and adjacent wall.
- G. Seal joints and services through walls with sealant to provide moisture and vapor seal.

3.03 FIELD QUALITY CONTROL

- A. Test and adjust control equipment to ensure performance conforms to specified requirements.
- B. Operate each room and test full range of functions over a continuous 24-hour period, recording physical data on operating equipment. Continuously record temperature and humidity.
- C. Test each room for air tightness.
- D. Adjust and re-test any rooms not meeting requirements.
- E. Provide three copies of a written quality control test report.
- F. Shut off equipment and controls and lock doors to prevent operation or access by unauthorized persons.

3.04 CLEANING

- A. Remove temporary protection from prefinished surfaces.
- B. Wash and clean floor, walls and ceiling inside room and exposed surfaces on the outside. Clean glass, fixtures and fittings.

3.05 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate, in the presence of the Owner, the operation, function, and maintenance of each room and its associated equipment.

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- B. Manufacturer's Demonstration Representative: Fully knowledgeable of operating and servicing the work.
- C. An instructional manual shall be furnished to the authorized representative of the Owner. The manual shall contain information on the sequential operation, all pertinent controls manuals, all warranties, refrigeration drawings and a wiring schematic.

DIVISION 14: CONVEYING SYSTEMS (Change # 7 9/1/2005)

14210/14240 ELEVATORS

I. EQUIPMENT

1. All new equipment and component parts supplied and installed shall be manufactured and distributed by a third-party, non installer company servicing the vertical transportation industry.
2. Equipment and component systems shall not employ any experimental devices or proprietary designs that could hamper (including ready accessibility and availability as well as minimal lead time for all replacement parts) and/or otherwise prohibit subsequent maintenance repairs or adjustments by all qualified service contractors.
3. Apparatus shall be rated the best commercial grade suitable for this application.
4. All equipment provided shall be factory and field tested with a history of design reliability and net-useful life established.
5. Manufacturers of the new apparatus shall provide technical support and parts replacements for their equipment and component systems for a minimum of twenty (20) years, and issue such guarantee of support to the purchaser with written certification naming the final Owner of their product(s) to ensure the apparatus or systems remain maintainable regardless of who may be selected for future service.

II. MAINTENANCE SERVICES

1. Full, all inclusive protective maintenance on the equipment shall be provided as part of the elevator installation, from the date of contract award and for a period of one (1) year from the date of final acceptance of the entire installation, coordinated with the one (1) year warranty period.
2. The maintenance shall include systematic examinations, adjustments and lubrication of all equipment.
3. The warranty maintenance shall be coordinated with the normal operation schedule of the building and shall include 24-hour emergency call-back service.
4. During this warranty maintenance period, whenever repair or replacement of any parts or equipment is required, only genuine standard parts recommended by the manufacture of the equipment installed shall be used.