

GENERAL PROJECT DESIGN & INSTALLATION GUIDELINES

SECTION 1 – GENERAL (Division 01 in 2004 Edition (CSI) Master Format)

Consultants working at RIT must be pre-qualified and entered into the Approved Vendor List at Facilities Management Services (FMS). Application/information forms are available in hard copy or electronic format and will be sent to interested vendors upon request.

This guideline is for both new construction and renovation work. Please review the renovation projects in GREAT detail before you provide a proposal. The upfront field work required needs to be addressed.

While many parties may be involved in RIT construction projects, RIT FMS is the authoritative client for all projects. Suggestions, directions, needs, etc. which are raised by others during design phase work or construction phase work are not to be acted upon without approval of the designated Project Manager assigned by FMS to the job.

RIT recognizes that sustainability is a concept that seeks to provide the best outcomes for human and natural environments by meeting the needs of the present generation without compromising the ability of future generations to meet their needs. Whenever possible the University attempts to foster sustainability. Include sourcing products that can be recycled or are biodegradable and that contain less toxic and hazardous chemicals and additives; source reduction; and solid waste reduction as well as purchasing local goods that are grown in environmentally sound ways or buying products through systems that produce the least amount of environmental pollutants. The University desires that the Provider foster sustainability and partner with the University in the expanding areas of sustainability.

RIT Has signed the American College and University Presidents' Climate Commitment (ACUPCC) striving to move campus activities to a position of emission neutrality. As a component of this commitment, all new construction will be designed to a minimum LEED Silver rating.

We encourage our design consultants to apply a universal and inclusive design approach to ensure that our facilities are accessible to the entire community that RIT serves. In addition to accommodating the general public, RIT's community includes students with a variety of special needs. It is important to our campus that this approach include any accessibility requirements set forth by state building codes; and since we are a 'place of public accommodation', that all ADA requirements be adhered to, as required by the Federal government. **Note that the needs of the diverse RIT community may exceed statutory requirements in some cases.** In addition, for some projects, focus groups may be created to review the design to ensure that we do not install textures and colors that produce visual contrast issues for specific segments of the RIT community.

Contractors are required to review and understand the sections of this document related to their work.

RIT Owner-Architect Agreement and RIT General Conditions of the Contract:

1. These requirements do not supersede any requirements put forth in the standard contract language or general conditions.
2. A/E firm is responsible to review this document in detail, and discuss any concerns with FMS.
3. Contractors should raise any questions or concerns before work is bid.
4. Successful bidders shall confirm that their proposed methods meet these guidelines prior to installation.

Meetings:

1. During the project design phase, plan on a minimal of 4 review meetings per project – stakeholders meeting, SD design review, DD design review and CD design review. The DD review meeting requires additional documentation as follows:
 - a. A/E firm submits one set of documents – drawings and specifications to RIT.
 - b. RIT makes comments on drawings and specs within an agreed upon time frame.

- c. There is a review meeting at RIT to discuss each comment and determine what will be included in final Construction Documents. RIT will provide one set of comments.
2. A/E firm is responsible for documenting meeting minutes and distributing within 4 days of the meeting.

Drawings/Specifications:

1. A/E is required to follow the RIT CAD standards available on the FMS web site.
<http://www.rit.edu/fa/facilities/sites/rit.edu/fa/facilities/files/docs/CAD-REVIT%20Spec.pdf>
2. A/E is required to provide a code compliance plan to include but not limited to: fire extinguishers, occupant load, travel distance, and construction type.
3. A/E is required to provide a sign placement plan (all signage details are RIT standards) showing location of equipment and hazards, in accordance with Chapter 5 of the Fire Code of NY State & showing accessibility signage in accordance with Section 1110 of the Building Code of NY State. Room signs are not required to be indicated.
4. A/E is required to work directly with the temperature control group and:
 - a. Provide a detailed points list using the RIT points list template.
 - b. The temperature control specifications must be incorporated in the project specifications. FMS controls shall provide their latest version of the TC specification.
 - c. Complete set of the sequences of operation must be developed for the project.
 - d. Design team shall include all CAD drawings developed by the FMS Controls Department, as pertinent to the project.
 - e. Section 4 (scope) of the TC specification shall be revised for each project.
5. RIT is working on standard specifications and details. A/E firm is required to meet with FMS to understand the latest specific requirements. RIT requires the record drawings and specs to be delivered to RIT electronically following the RIT CAD standard format.
6. Before A/E progresses with construction drawings and specifications, room names/numbers and equipment numbers and nomenclature must be reviewed with and approved by RIT's Design, Engineering and Electrical Departments.
7. **RIT Office Space Standards**

| Position title | area | |
|---|-----------------------|--------------------------|
| | <i>Closed Offices</i> | <i>Landscape Offices</i> |
| • RIT President | 360 | na |
| • Deans/ VPs | 240 | na |
| • Assoc./Asst./Vice Deans & Assoc. VPs | 120 | na |
| • Dept Chair | 120 | 80 |
| • Director | 120 | 80 |
| • 1 st Dept Secretary/Admin. Asst. | 96 | 48 |
| • Receptionist | 48 | 48 |
| • Each additional Secretary | 36 | 36 |
| • Faculty / Staff standard office | 96 | 80 |

- Student Employees 8 8
(2'x4' work surface)
- Notes

Each program requires evaluation and review as to suitability of closed, or landscape office types per position.

Larger landscape units may include sliding door options for additional privacy depending upon responsibility level and privacy needs

Landscape office planning may require convenient nearby shared conference spaces with acoustical privacy for confidential meetings.

8. RIT's "General Project Design & Installation Guidelines" shall be included in all Project Manuals as an appendix and shall be referenced accordingly in the contract documents prepared by the A/E firm.
9. Use only standard measures (except, do not use straw bales around catch basins) from NYSDEC Blue Book Toolbox for SWPPP & Storm water Plans, or latest NYSDEC information.

Mechanical and Electrical Drawings

1. The following drawings are required for NEW construction:
 - a. Full plumbing isometric drawings for sanitary, storm and domestic water, with a fixture count table.
 - b. Air flow diagrams for supply and exhaust systems.
 - c. Hydronic flow schematics.
2. The following drawings are required for RENOVATION projects:
 - a. Provide separate drawings for removals and new work. Show all existing equipment on the removal set.
 - b. For the new work, show partial plumbing isometrics drawings (starting at point of connection) for the sanitary, storm and domestic water, with a fixture count table of new fixtures.
 - c. For the new work, show partial air flow diagrams (starting at point of connection) for supply and exhaust systems.
 - d. Show full (remaining existing with new work) hydronic flow schematics.
3. Electrical, Fire Protection, and Fire Alarm drawings in **black and white only**, do not use other colors.

Project Close-out

1. G.C. or C.M. is responsible for completing all required forms and submitting to RIT project manager for their records within 30 days of receipt of the C. of O. Forms shall include (but are not limited to):
 - a. [RIT HVAC Equipment Modification Form.pdf](#)
 - b. [RIT Electrical Equipment Modification Form.pdf](#)

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| SECTION 2 - SITE (Division 32 in 2004 Edition (CSI) Master Format) |
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1. **RIT Campus Site Soil Specifications for Landscaped Areas, and Restoration Standards**
 - a. All lawn areas shall consist of a minimum of 8" of screened and amended (compost added 15-20% minimum) topsoil, raked and hydro-seeded using specified grass seed mix. Include an alternate price for 12" of topsoil.
 - b. Landscaped bedding areas shall be a minimum of 18 inches of screened and amended topsoil with an organic content of 40%.
2. **Restoration Standards – (Installing Underground Utilities)**
 - a. All underground excavation operations performed on Campus to install, repair, upgrade or remove a utility structure (i.e. gas, water, storm sewer, sanitary sewer or drain pipe, tank, hydrant, heating

conduit or telecommunication duct), shall not be deemed complete until restoration of the disturbed area is completed per this standard.

- b. Restoration under this standard shall consist of the following items or steps as a minimum:
- c. Backfill excavated area in a manner designed specifically to protect any underground utility structure in the area from possible damage incurred by the type of backfill material being used. (i.e. sand padding, blocking, pea gravel or cement encasement may be required to protect underground utility structures).
- d. Tamp all backfill material in 12” lifts to minimize subsequent settling of excavated area.
- e. Under roadways and sidewalks, final 24” of backfill material shall be tamped “crusher-run” stone, tamped in 12” lifts.
- f. Roadway and sidewalk asphalt surfaces shall be paved with a hot-mix asphalt material of equal quality and density to that material removed during excavation, with the surface rolled and smoothed to minimize surface irregularities where new surface adjoins other paved surfaces. Installation shall achieve maximum bonding with the vertical edges of adjoining paved surfaces.
- g. Concrete surfaces shall be formed and poured with material to match as nearly as possible the adjoining concrete surfaces in alignment, thickness, texture and color.
- h. All curbing units shall be reinstalled in the same manner and alignment as the adjoining units. Replacement units shall match adjoining units in material, size, shape and color.
- i. In lawn areas, final 8” of fill material shall be topsoil (amended as described above), raked and hydro-seeded using grass seed mix as specified and approved per submittal by Grounds Foreman. Include an alternate price for 12” of topsoil.
- j. All spoil, rock, construction materials and unused backfill material shall be removed from the Campus and disposed of in an appropriate manner unless directed to be stored on campus by the Grounds Foreman.
- k. Contractor shall be responsible for repair of any settlement occurring over excavation site for a maximum of eighteen (18) months after restoration completed.

3. **Trees**

- a. Ornamental trees shall be planted at least 12-15 feet outside of the footprint of the nearest building.
- b. Shade trees shall be planted at least 20-25 feet outside of the footprint of the nearest building.
- c. Design consultant shall review tree placement with the FMS Grounds Foreman prior to issuance of bid documents.

4. **General Standard for Outdoor Amenities**

- a. Where possible, avoid the construction of Confined Spaces (i.e. pump in manhole for water feature).
- b. Provide refuse and recycling dumpster locations in proximity to service areas of building.
- c. Dumpster enclosures shall be a 9-foot high steel wall panel system matching Centria #BR5-36 (20 ga.). The color shall be 9911 Pebble or approved equal. A second option, if approved by the Director of Planning & Design is to match #390 Surrey Beige from Flexospan standard colors; with a Flexshield Kynar 500/Hylar 5000 siliconized polyester finish.

5. **Water Lines**

- a. Use left hand valves on water mains.
- b. Use push-on joint PVC Pressure Class C900-DR-18 - 235 plastic for water mains up to a maximum of 12 inches diameter.

- c. Back fill around water lines with 12 inches of ice control sand after laying line on 12 inches of ice control sand (NYSDOT # 703-06).
- d. Provide Copperhead Solid #12 tracer wire with blue jacket, terminate in curb boxes.
- e. Underground valve or metering vaults shall not be installed.
- f. Water lines shall have a minimum of 5 feet of cover.

6. Gas Lines

- a. Use HDPE plastic for gas lines.
- b. Provide a 12 inch ice control sand envelope around gas line.
- c. Provide Copperhead Solid #12 tracer wire with blue jacket, terminate in curb boxes.
- d. Underground valve or metering vaults shall not be installed.
- e. Gas lines shall have 3-4 feet of cover.

7. Storm Sewer Systems

- a. All storm lines to be HDPE plastic (6 inches diameter and above to be smooth bore with corrugated exterior)
- b. Galvanized or steel pipe is not to be used.
- c. All structure covers in walkway and driveway areas are to be ADA compliant.

8. Catch Basins

- a. Pre-cast catch basins only.
- b. No bricks to be used to level grate.
- c. Cast a concrete apron around grate – 6” min.
- d. Set catch basin 2” low in lawn areas.
- e. All catch basin covers and grates in walkway and driveway areas are to be ADA compliant.

9. Trench Drains

- a. **Avoid the use of trench drains if at all possible.** Use of trench drains requires Utilities Director approval.

10. Bike Racks:

- a. UpBeat Incorporated – High Style Bike Rack – Plastic Coat Finish – 9 Bike Capacity – Black – In ground or surface mount are acceptable, depending on application. This is commonly known as the “Wave” bike rack.
 - Part # - 6BFSC-LBR9PVCSURF (surface mount)
 - Part # - 6BFSC-LBR9PVCING (in ground mount)

11. Bike Shelters:

- a. Shelters shall be 8’ wide, Vangarde Bike Shelter by Daytech Limited or an approved equal. A black powder coat finish is required. Length shall be 12’ or 16’. Install per manufacturer’s specifications.
- b. RIT obtains the shelters from MSS Media. Contact can be made with MSS Media through RIT’s Parking and Transportation Office.
- c. “Lock-It” bike racks from Barco Products, or an approved equal, shall be used in the shelters. Model #05JA1410 (2 bike capacity) shall be used.

- d. The bike racks shall be spaced 30” on center with the outside racks having equal spacing on their outside edges.
- e. Shelters shall be installed on 6” concrete pads, reinforced with welded wire mesh, on top of a 6” subbase course that sits on top of a geotextile fabric.

12. **Waste Baskets:** All landfill receptacles **must** have a recycling receptacle next to it.

- a. Landscape Forms SCARBOROUGH LITTER RECEPTACLE – with liner 25 inch x 40 inch high, side opening, vertical strap panel, freestanding. Powder coat: Grotto (Black). Wording across top of lid to read “Landfill”.
- b. Landscape Forms SCARBOROUGH LITTER RECEPTACLE – with liner 25 inch x 40 inch high, side opening, vertical strap panel, freestanding. Body of receptacle powder coat: Grotto (Black). Lid of receptacle powder coat: Ocean (Blue). Wording across top of lid to read “Recycle”.

13. **Landscape Tables:**

- a. Parkitects – 4 seat tables – plastisol finish – black perforated metal.
 - Part # - 64-959-3 UMB (handicap accessible)
 - Part # - 64-959-4UMB

14. **Park Benches:**

- a. Columbia Cascade – TimberForm – 2600 series bench – black cast metal – purple heartwood slats. 6’ Long.

15. **RIT Site and Parking Lot Design Standards:**

The following notes and specifications need to be included in engineering packages:

- a. Contractor to have approved drawings.
- b. Contractor to provide schedule of work.
- c. Contractor to call both RIT and Dig Safely at least four days in advance for utility stakeouts.
- d. Contractor to provide survey/utility drawing based on RIT datum.
- e. Contractor to provide and maintain erosion control as noted on plan prior to start.
- f. Provide proper signage during construction to maintain traffic flow.
- g. Provide required maintenance and protection of traffic.
- h. Strip and stockpile topsoil on site per RIT direction. Discuss requirements **per project** with Grounds Foreman prior to issuing bid drawings.
- i. Excess non topsoil to be determined by RIT if left on site or removed from site.
- j. Contractor to provide and install required temporary and permanent signage.

16. **Full Depth Pavement for Roadways/Parking:**

- a. Well compacted sub-grade
- b. Geotextile Fabric- Mirafi 500x or as directed by Engineer
- c. 12 inch #2 Crusher Run stone sub-base, NYSDOT Item 304.12
- d. 3 inch asphalt concrete binder course NYSDOT item 403.13 Type 3
- e. 1 ½ inch asphalt concrete top course NYSDOT Item 403.19 Type 7
- f. Under drain as determined by Engineer

- g. Compaction testing
 - h. Existing pavement to be saw cut and tack coat cuts as required. NYSDOT item 407.01
 - i. Asphalt concrete truing and leveling course NYSDOT item 403.2.1
 - j. Check with RIT Project Manager to confirm if heavy duty pavement detail is required.
- 17. Curbing:**
- a. Granite 5 inch wide x 16 inch deep with 6 inch reveal
- 18. Striping:**
- a. Parking spaces to be 9 feet 0 inch wide center to center with 4 inch solid yellow painted lines.
 - b. Handicapped spaces, access aisles and signage to be per NYS Building Code.
- 19. Asphalt Sidewalk:**
- a. Well compacted sub-grade
 - b. Geotextile fabric-Mirafi 500X or as directed by Engineer
 - c. 12 inch #2 crusher run stone sub-base, NYSDOT item 304.12
 - d. 2 inch asphalt concrete binder course NYSDOT item 403.13 type 3
 - e. 1 inch asphalt concrete top course NYSDOT item 403.19
 - f. Must have a clear, unobstructed width of at least 8-feet.
- 20. Concrete Sidewalk:**
- a. Well compacted sub-grade.
 - b. Geotextile fabric-Mirafi 500X or as directed by Engineer.
 - c. 6 inch #2 crusher run stone sub-base, NYSDOT item 304.12 type 2.
 - d. 6 inch concrete, minimum 4000 psi (broom finish) including 6x6x6 WWM. Expansion joint every 50 feet.
 - e. Concrete to receive 2 coats of a membrane finish sealer applied at rates specified by product manufacturer.
 - f. Control joints to be 1/8 inch wide saw cut, 1/3 slab depth thickness.
 - g. Must have a clear, unobstructed width of at least 8-feet.
- 21. Precast Concrete Pavers**
- a. Shall be “prest brick” as manufactured by Hanover Architectural Products, 240 Bender road, Hanover, PA 17331, or approved equal.
 - b. Width: 4” Length: 8”, Thickness: 3”
 - c. Four color scheme of custom blended colors: Tan, Brown, Red/Brown (B92453), and Charcoal
 - d. 1” leveling course
 - e. 6” concrete base course (reinforced with wire mesh)
 - f. 12” compacted subbase
 - g. Where pavement abuts lawn or a shrub bed, provide a paver edge. Extend gravel under slab 3-5” from edge of pavers to allow for installation.

22. Manholes – (Elect, Storm, Tele, San, MTHW, CHW)

- a. Pre-cast structures to be used.
- b. No bricks, use plastic or concrete rings to raise cover.
- c. Use 30” traffic H20 rated manhole covers & rings.

SECTION 3 – CONCRETE (Division 03 in 2004 Edition (CSI) Master Format)

1. No RIT-specific standards yet established. “Best Standards of the trade”.
2. If exposed exterior concrete is used, the Designer must include preventative measures to address potential efflorescence.

SECTION 4 – MASONRY (Division 04 in 2004 Edition (CSI) Master Format)

1. RIT Belden Brick supplied by Weckesser - Number 470-479 Dark A RIT Iron Spot.
2. RIT mortar mix for brick- C-2 ESS ROC/RIVERTON-FLAMINGO.
3. RIT caulk for brick areas – Sika-Flex or equal as approved by owner - “Redwood Tan”.

SECTION 5 – METALS (Division 05 in 2004 Edition (CSI) Master Format)

1. Exterior architectural metal work is to be powder coated semi-gloss in color, exceptions on a case by case basis approved by the Director of Campus Planning & Design Services.

SECTION 6 – WOOD PLASTICS (Division 06 in 2004 Edition (CSI) Master Format)

1. Office shelving is $\frac{3}{4}$ inch red oak veneered (both sides) plywood banded on three sides, 8 feet long by 12 inch wide or per direction by Project Manager. Support shelving 16 inch OC.

SECTION 7 – THERMAL/MOISTURE PROTECTION (Division 07 in 2004 Edition (CSI) Master Format)

1. Safety railings and/or tie-off points for compliance with OSHA Fall Protection shall be provided for rooftop inspections and service of mechanical equipment, electrical equipment, roof drains, and the roof membrane.
2. Fire-Stopping to be performed by a Fire-Stopping Contractor. There shall only be one fire-stopping contractor per project to cover the work of all trades. Tested and approved fire-stopping details and assembly numbers are to be included in the A/E permit and bid drawings. Contractor to submit fire-stopping package for review and comment.
3. All fire separations (fire walls, fire barriers & fire partitions) shall be labeled “Fire Rated x Hours” (where x is the time) above the ceiling. Labeling to be stencil painted or applied vinyl graphic in red color with min. 3” high letters in san serif font, such as ‘Arial’, with min. $\frac{1}{2}$ ” brush stroke; located at maximum 20’-0” intervals and positioned so as not obstructed by ductwork and/or piping.
4. Envelope performance requirements for new buildings shall exceed the minimum requirements of the Energy Conservation Construction Code of NY State by a minimum of 10% unless determined by the Director of Planning & Design.

SECTION 8 – DOORS/WINDOWS (Division 08 in 2004 Edition (CSI) Master Format)

1. **New building** – window glass color and profile to approved by the Director of Planning & Design Services.
2. **Renovation work** – match existing glass color with Owner approved insulated glass profiles. (Approved by the Director of Planning & Design Services).
3. **Two “Knox” lock boxes** shall be installed:
 - a. A Knox box for a building key card shall be placed at the designated entrance for use by the Fire Department.
 - b. A Knox box for building keys (fire panel, mechanical rooms, etc) shall be mounted above the Fire Alarm Annunciator Panel or main Fire Alarm Control Panel if the control panel is in a public area.
4. **Hardware -General:**
 - a. A power door operator shall be provided on one leaf at each entrance.
 - b. One card- reader to be provided at the primary building entrance.
 - c. Card swipe electronic access to certain interior spaces may be required on a project and program specific basis; design for electric strike, coordinate electric strike and hardware with access system provider.
 - d. Do not use electrified locksets for interior or exterior applications, use electric strikes. Do not use Mag Locks. Locks shall default to the “Locked” mode during a power failure.
 - e. Locking and latching hardware is subject to ADA Technical Requirements concerning access for disabled persons. Conformance to such requirements, as well as other building code or life safety regulations, is required.
 - f. Contractor to provide and install door hardware. A/E firm to confirm with RIT Project Manager prior to issuing construction documents if cores and keys are to be provided by contractor or RIT.
 - g. (See door frame paint comments under Section 9-Finishes)
 - h. Mortise cylinders, US 26D finish, to accept 7-pin small format interchangeable core
 - i. For specification assistance contact:
Andy Lindenberg, AHC
Specification Consultant
585-248-1524
Andy_lindenberg@irco.com
 - j. DELIVERY, STORAGE, AND HANDLING
 1. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
 2. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
 3. Deliver keys and permanent cores to Owner by registered mail or overnight package service. : RIT FMS-Lock Shop1 Lomb Memorial Drive, Rochester, NY 14623
 - k. KEY AND CORE PACKAGING SPECIFICATIONS
 1. Core mark stamped on each core.
 2. Keys are to be packaged individually and labeled with core mark and door location.
 3. All keys and to be serialized.

5. Hardware – Specifications, Interior:

- a. Finish: Brush Chrome,
- b. Style: Lever Type - Heavy Duty
- c. Hinges: Ives 5BB1HW-NRP, 4.5 x 4.5 (non-removable pins NRP when exposed)
- d. Door stop (wall): Ives WS407CVX.
- e. Rubber door silencers: Ives SR64.
- f. Smoke seals: NGP 5020 (when required)
- g. Closer: LCN 4011 for inside of door (HD arm is std.)

6. Hardware – Specifications, Exterior:

- a. Finish:
 - 1. New buildings - review finish on a case by case basis with the Director of Planning & Design Services.
 - 2. Renovation work: bronze finish (to match existing).
- b. Exit Devices: VonDuprin (function to suit situation)
- c. Pulls: Cipco #97-103
- d. Hinges: Roton #780-224 HD Bronze finish
- e. Closers: LCN #4114H Cush-n-Stop bronze (HD arm is std.)
- f. At exterior doors where wind resistance is a major concern, the swing door operator shall be the Besam SW200i by ASSA ABLOY.

7. Hardware - Function:

- a. Set #1 (office):
 - 1. Lockset: Schlage, ND53BD x RHO, for 7 pin small format interchangeable core, US26D finish, office function, key on outside - push and turn button
- b. Set #2 (classroom):
 - 1. Lockset: Schlage, ND87BD x RHO, for 7 pin small format interchangeable core, US26D finish, institutional privacy function, outside lock/unlock - key only
- c. Set #3 (store room):
 - 1. Lockset: Schlage, ND80BD x RHO, for 7 pin small format interchangeable core, US26D finish, store room function, always locked – operated by key only
- d. Set #4 (passage):
 - 1. Lockset: Schlage, ND10S x RHO, US26D finish, passage set, no lock
- e. Set #5 (unisex toilet)
 - 1. Lockset: Schlage, ND50D x RHO, US26D, Entrance/Office - push bottom, 7 pin small format interchangeable core.

SECTION 9 – FINISHES (Division 09 in 2004 Edition (CSI) Master Format)**1. Acoustic Ceilings:**

- a. General
 - i. Design to minimize hard ceilings.
 - ii. Replacement Work: match existing tile, when possible, provide standard tile and grid

- b. Ceiling Height:
 - i. Classrooms, Labs, Conference Rooms, and Seminar Rooms are 10 feet 0 inch, but are not to exceed 11 feet 0 inch with the following exceptions:
 - 1. Classrooms, Conference Rooms, and Seminar Rooms under 30 seats can be reduced to 9 feet 6 inch.
 - 2. Classrooms and Auditoriums of over 65 seats should be considered an exception and the height should be raised as sight line and considerations dictate.
 - 3. Offices and Corridors should have a ceiling height of 9 feet 0 inch except for large office spaces and special corridors which may be taller.
- c. Material – Standard Specification (academic areas, classrooms, labs and offices):
 - i. Tile: non-directional fissured, 2 feet x 4 feet x 5/8 inch, white, lay-in or tegular, sag-resistant, min. xx year warranty
 - ii. Grid System: 15/16 inch exposed tee system, heavy-duty service, white
 - iii. Basis for design:
 - 1. Armstrong; Cortega Minaboard #769 & Prelude MX
 - 2. USG; Omni #90 & DX System
- d. Material – Special Area Specification (public areas and circulation spaces)
 - i. Review with the Director of Planning & Design Services.
 - ii. Tile: Non-directional fissured, 2 feet x 4 feet x 5/8 inch, white, tegular, sag-resistant, min. xx year warranty
 - iii. Grid system: 15/16 inch exposed tee system, heavy-duty service, white
 - iv. Basis for Design:
 - 1. Armstrong Cortega Second Look I, II or IV
 - 2. USG, Omni 90 (ILT-edge), Illusion Two/24, Eight/12 or Thirty-two/6
 - 3. Armstrong Cirrus Open Plan (15/16 inch square lay-in or angled tegular)
 - 4. Armstrong Cirrus Second Look I & II (beveled tegular)
 - 5. USG Frost square lay in or fineline bevel
 - 6. USG Frost Chex/4, Chex/6 or Chex/36
- e. Material – Support Area Specification (kitchens, bathrooms)
 - i. Tile: 2 feet x 4 feet x 5/8 inch, white, tegular, sag-resistant, min. xx year warranty
 - ii. Grid system: 15/16 inch exposed tee system, heavy-duty service, white
 - iii. Basis for Design:
 - 1. Kitchens: Armstrong Ceramaguard
 - 2. Toilet Rooms; Armstrong Armatuff

2. Carpeting Tile & Performance Broadloom:

- a. General
 - i. Minimum product warranties required:
 - 1. Lifetime non-prorated warranty covering delamination
 - 2. Lifetime non-prorated warranty covering edge ravel (seam zippering)
 - 3. Lifetime non-prorated warranty covering dimensional stability
 - 4. Lifetime non-prorated warranty covering resiliency
 - 5. Twenty (20) year warranty against excessive surface wear. (Excessive wear means more than 15% loss of pile fiber weight measured before and after use.)
 - 6. Twenty (20) year warranty for stain resistance
 - ii. Extra Materials:
 - 1. Attic stock to be included at 5% of total yardage
 - 2. Useable scraps to be returned to RIT
 - 3. Deliver to RIT storage space as designated by RIT Project Manager
- b. Product
 - i. Floor preparation
 - 1. All products supplied to be as recommended/approved by carpet tile manufacturer
 - 2. Floor preparation products may include but are not limited to:
 - a. Concrete slab primer

- b. Patching compounds
 - c. Trowelable underlayment
 - 3. Supply calculated zero VOC, releasable, non-flammable, low odor, anti-microbial, non-toxic adhesive. Glue is to be used when requested at seams and peripheral edges only to significantly reduce removal cost and ability to install over VAT.
 - ii. Characteristics, Performance & Test Procedure References
 - 1. Cut, loop, cut & loop and tip shear surface textures are allowed as long as they meet the 'Typical End-Use Description', as defined by CRI.
 - 2. Dimensional Stability: +/- 0.15% maximum per ISO 2551
 - 3. Delamination resistance of secondary backing: 2.5 lbs/inch minimum (if applicable) per ASTM D3936
 - 4. Colorfastness: as recommended by CRI per AATC16 & 16; Solution dyed nylon and dyed yarn are acceptable as long as warranty meets standard for colorfastness.
 - 5. Type 6-6 Nylon or alternates, as approved by Planning & Design, to be used throughout campus.
 - 6. Recycled content must be a minimum of 30% with minimum post-consumer recycled content of 5%
 - 7. Product shall contain no added anti-microbials
 - 8. Pre-attached, high performance backing, non-urethane preferred, with a minimum rating of NSF-140 Gold.
 - 9. Must meet the following certifications and bidders must provide proof of certification:
 - a. NSF/ANSI 140, platinum rating
 - b. Carpet and Rug Institute's Green Label Plus program.
 - c. 3rd party certified EPD (Environmental Product Declaration)
 - d. Produced in ISO-14001 certified manufacturing facility
 - e. Cradle to Cradle Silver v3.0 certified
 - f. TARR rating minimum of 3.0 (Heavy foot Traffic) to 3.5 (Severe +)
 - 10. All carpet shall be 100% recyclable and manufacturer of product shall offer 3rd party certified closed-loop recycling program.
- c. Execution
 - i. Recycling
 - 1. Carpet recycling options consist of:
 - a. Repurposing: re-using product in another application such as donation to charity or not-for-profit organizations
 - b. Closed loop recycling: turning waste materials of same value
 - c. Open-loop recycling: creating other product types from the reclaimed product
 - d. Waste-to-Energy: using carpet for waste-to-energy. This options is last resort and requires justification
 - e. Landfill or incineration: are not approved disposal methods.
 - 2. All possible recycling options shall be clearly presented and submitted in writing to owner and agreed upon prior to start of job.
 - 3. At the completion of the project, a certificate shall be furnished verifying the reclamation of the carpet and the pounds of material diverted from the landfill
 - ii. Submittals
 - 1. Where carpet color, style and accessories are not specified OR when alternates are proposed, samples of proposed product(s) must be submitted to P&D for review & approval, a minimum of two weeks prior to ordering.
 - 2. Submit shop drawing showing installation orientation
 - 3. Product data documenting results following tests by an NVLAP app'd laboratory
 - a. Electrostatic propensity
 - b. Flooring radiant panel test
 - c. Smoke density
 - d. Pill test

3. Hard Floors:

- a. Quartz tile minimum, VCT if Owner approved.
- b. The use of hardwood floors is to be avoided, and requires the approval of the AVP of FMS.

4. Stairs:

- a. Stair stringers should not have exposed metal nosing that is part of the horizontal section of step.
- b. All stair nosings in Assembly areas shall be finished so that adequate visual feedback is provided, via color contrast per code. A significant number of RIT students have Usher's Syndrome, a condition affecting visual discrimination.
- c. Interior stair treads shall be Super Stairmaster Type 511SN by Wooster Products or equal as directed by the Project Manager. The tread shall cover the stair with a 1 inch reveal on each side and shall have 2 yellow bands at the nose.

5. Mechanical Room Floors:

- a. If mechanical rooms are located above occupied space, provide water proof floor system. Material is called Florock by Crawford Laboratories, 4165 South Emerald Ave, Chicago, IL 60609. 1-800-356-7625.
- b. Floor to be painted or sealed. Use Sherwin Williams ArmorSeal Tread-Plex 100% Acrylic floor coating or use Sherwin Williams ArmorSeal Rexthane 1 MoistureCure Urethane. Utilize slip-resistant additive such as H&C, Rhino or ArmorPoxy, per manufacturer's directions and applied in a 5' x 5' area at any exterior access.

6. Entrances:

- a. If a pedi-grid is installed, the pan under it must be at least an additional 4 inches deep, be welded non-rusting stainless steel, and not have a drain. No vinyl or stainless steel grids for pedi-grid (use fiberglass Gatordeck by Seasafe or equal with proper support). The pedi-grid shall not be the full width or length of a vestibule so that it can be lifted out of the pan from inside of the space.
- b. If entrance matting is used, must be High performance backing material with nylon fiber, not olefin.
- c. Thresholds should have anti-slip characteristics, not 6 inch brass, creates trip hazard in winter.
- d. Include hydronic ice melt system at main entry.

7. Paint Colors:

- a. RIT has standard paint colors. Consultants may vary from these standards only with specific prior permission from RIT FMS. RIT has a preferred contract with Sherwin Williams.
 - a. (Water based, No VOCs)
- b. Use Sherwin Williams ProGreen 200 or Promar 200 paint in eggshell finish for interior walls.
- c. Use semi-gloss acrylic enamel. (ProIndustrial O-VOC) for trim and door frames.
- d. In general, door and window frames in solid walls are to be painted to match adjoining walls. Wood doors are not to be painted. Flush metal doors may either be an accent color or the adjoining wall color.
- e. Interior metal door frames scheduled to be painted are, typically, to be painted as appropriate for metal finishing and to match the adjacent wall color. Variations from this standard are only with specific prior permission from RIT FMS.

- f. Interior Paint:
- i. The following are standard interior paint colors selected from Sherwin Williams paints.
 - #SW6119 Antique White
 - #SW6385 Dover White
 - #SW6197 Aloof Gray
 - #SW6148 Wool Skein
 - #SW7655 Stamped Concrete
 - #SW6120 Believable Buff
 - #SW6129 Restrained Gold
 - #SW6272 Plum Brown
 - #SW6335 Fired Brick
 - #SW6341 Red Cent
 - #SW6300 Burgundy
 - #SW6109 Hopsack
 - #SW6415 Hearts of Palm Green
 - #SW0031 Dutch Tile Blue
 - #SW0032 Needle Point Navy
 - #SW0013 Majolica Green
 - #SW6186 Dried Thyme
 - #SW6230 Rainstorm
 - #SW6710 Melange Green
 - #SW6751 Refresh
 - #SW6688 Solaria
 - #SW6541 Daydream
 - #SW6887 Navel
 - RIT Brown; (R2 17/32)(W1 2/32)(Y3 52/32)(B1 2oz. 57/32).
 - RIT Orange

SECTION 10 – SPECIALTIES (Division 10 in 2004 Edition (CSI) Master Format)

1. Signs and Wayfinding:

RIT has standards for interior and exterior signs including approved typefaces, colors and text. Consultants should consult with Project Managers for the latest approved edition of RIT sign standards & Graphic Identity Guidelines before designing these elements.

a. Existing buildings with wood sign plaques:

- i. Sign plaques shall be made to the detail and dimensions shown in figure #1 of $\frac{3}{4}$ " thick, flat solid red oak and finished with three coats of clear lacquer.
- ii. Plaques shall be set with the top edge at 5'-4" above the finish floor, see figure #2.
- iii. In long hallways, the tops shall be set from the ceiling height down to avoid reflecting an uneven floor line.
- iv. Plaques are to be installed 1" away from the doorframe on the latch side of the door. In case of interference or obstruction the plaque can be cut to no more than $\frac{1}{2}$ its height and/or moved to 1" from the obstruction, or moved to the hinge side of the door.
- v. In locations having double doors, plaques shall be mounted to the right of the right hand door.
- vi. For alcove doors the plaque shall be placed outside the alcove on the latch side as above.
- vii. RIT standard black, plastic laminate signs are to be mounted over the plaque mounting holes.

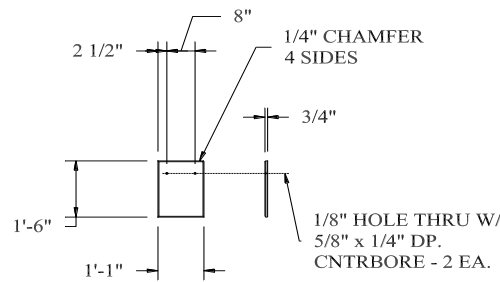


FIGURE #1
PLAQUE DETAIL

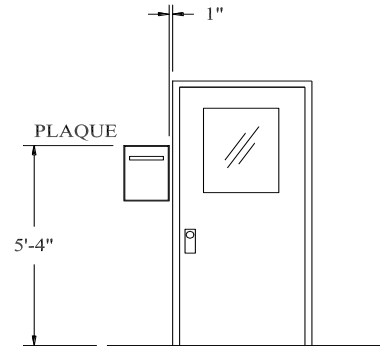


FIGURE #2
ELEVATION

b. New Buildings:

- i. Interior signs are to be from the ‘Artemis’ sign system or similar. Signage inserts must be able to be maintained by the RIT sign shop (contact the Sign Shop for capabilities). Design consultant shall request detailed information about RIT’s signage design standard from the Project Manager prior to issuance of bid documents.
 1. Font: Universe condensed 57
- ii. Room ID and occupant name signs are to be installed with the top at 5’4” above the finish floor in a similar manner to the wood plaques described above.
- iii. Building evacuation inserts are produced and installed by Planning & Design.Services.

c. Exterior Building Signs:

- i. The building main entrance to have building name above doors in 4 inch high Universe Condensed Bold font per sketch (no building number on sign; place building numbers on building surface at corners facing fire lanes or roadways as required by Section 505 of FC of NY State).

SECTION 11 – EQUIPMENT (Division 11 in 2004 Edition (CSI) Master Format)

1. **Owner will provide Fire Extinguishers.** Contractor to provide Fire Extinguisher cabinets by JL Industries or Owner approved equal. Cabinets are to be nonlocking.

| <u>TRIM & DOOR &</u> | | | | | <u>WALL OPENING:</u> | | | | |
|------------------------------|-------------------|-----------------|-----|------|----------------------|---------|------------------|-----|--------|
| <u>SERIES #</u> | <u>Trim Style</u> | <u>TUB I.D.</u> | | | <u>FRAME O.D.</u> | | <u>NON-RATED</u> | | |
| Aluminum | Trim Style | W | H | D | W | H | W | H | D |
| 2025 | Flat Trim | 12” | 27” | 7 ¾” | 15 3/8” | 30 3/8” | 13” | 28” | 7 7/8” |

2. Classroom Educational Technology Standards:

Designer is to meet with FMS Project Manager and Teaching & Learning Services (TLS) Classroom Technology Consultant to coordinate classroom technology infrastructure.

3. Waste Management:

- a. Purchase Requirements
 - i. Containers must meet Rochester Institute of Technology design requirements

- ii. Alternative (custom) containers must meet Rochester Institute of Technology guidelines for appearance, functionality, and custodial service standards. Alternative containers can be purchased only upon prior approval by RIT Sustainability and Custodial Services.
 - iii. All costs associated with the purchase and placement of required recycling and solid waste containers must be included as part of the project construction or renovation costs
- b. Container Requirements (General)
- i. All receptacles (landfill, recycle and compost) must meet or exceed the EPA's most recent guidelines for post-consumer recycled content for receptacles.
 - ii. Receptacles must be co-located into waste stations. Single unit systems must have the ability to collect a **minimum of 3 separate streams**. Individual containers must have the ability to be interconnected or anchored in place.
 - iii. All receptacles (landfill, recycle, and compost) must be the same or similar in design, but differentiated by lid color to indicate the appropriate stream. Landfill: Black, Recycle: Blue, Compost: Green
 - iv. Interior stations must, at a minimum, have signage at eye level (either on the wall or attached to the container). Signage must be approved by the recycling department and have the ability to be changed with relative ease and minimal expense.
- c. Container requirements (Interior)
- i. Public Area Bins
 - 1) Main entryways and lobbies (Transition® TIM Configurable Recycling Container)
 - a) Single unit system with the ability to collect a minimum of 3 separate streams for centralized collection
 - b) Must have affixed backboard for signage
 - c) Minimum of two sets per floor within public spaces (entrances and/or reception areas and elevator lobbies) is required for basic level of coverage
 - d) Set dimensions: 47.50" x 18.00" x 48.75"
 1. Lid opening - Landfill
 - Shape: square/rectangular
 - Color: black
 2. Lid opening – Recycle
 - Shape: circle inside of long slot
 - Color: blue
 - Contact RIT Sustainability for 3rd collection stream.
 - e) Serviced by custodians, who transport material to containers located behind buildings or at loading areas
 - 2) Athletic Facilities (GreenDrop)
 - a) Single unit system with the ability to collect a minimum of 3 separate streams for centralized collection
 - b) Must have affixed backboard for signage
 - c) Must include front advertising panels
 - d) Minimum set dimensions: 42.50" x 22.8" x 43.7"
 1. Lid opening - Landfill
 - Shape: square/rectangular
 - Color: black
 2. Lid opening – Recycle
 - Shape: circle inside of long slot
 - Color: blue
 3. Lid opening – Compost
 - Shape: circle
 - Color: green
 - e) Serviced by custodians, who transport material to containers located behind buildings or at loading areas



- ii. Classroom Bins* (“Waste Watcher” 23 gallon)
- 1) Collection bins for 2 streams: Landfill (black lid) and Single Stream Recycling (blue lid), including sign frames and connectors.
 - 2) Blue lid: (single stream) with 5” diameter circle inside a slot that is 1.75”W x 16.25”L
 - 3) Black lid (Landfill) with rectangle opening (12.5”W x 7.5”L)
 - 4) Custom label graphic for sign frames provided by RIT sustainability
 - 5) Serviced by custodians into rolling collection carts
 - 6) Placed within large classrooms, large meeting spaces, lunch rooms/break rooms, and kitchens
 - 7) Container dimensions: 20”L x 11”W x 30”H (42”H with lid), 23 Gallon capacity, Weight: 6.3 lbs (with lid 7.2 lbs)
 - 8) Set dimensions: 26” wide, 20” deep, 42” high
- iii. Conference Room Bins (“Waste Watcher” 16 gallon)
- 1) Collection bins for 2 streams: Landfill (black lid) and Single Stream Recycling (blue lid), including sign frames
 - 2) Blue lid: (single stream) with 5” diameter circle inside a slot that is 1.75”W x 16.25”L
 - 3) Black lid (Landfill) with rectangle opening (12.5”W x 7.5”L)
 - 4) Custom label graphic for sign frames provided by RIT sustainability.
 - 5) Placed within small and medium sized conference rooms and meeting spaces
 - 6) Container dimensions: 20”L x 11”W x 24”H (36”H with lid); 16 gallons
 - 7) Set dimensions: 26” wide, 20” deep, 36” high
- iv. Desk-Side Recycling & Waste
- 1) Personal desk-side recycling container with companion waste container for administrative workstations and/or desks
 - 2) Mini waste container hangs on the side of the recycling container
 - 3) Container dimensions (recycle): 14.5” wide, 10” deep, 15” high; 28 quart
 - 4) Container dimensions (landfill): 8” wide, 6” deep, 7” high; 3 quart
- d. Container requirements (Exterior) – See SECTION 2 – SITE (Division 32 in 2004 Edition (CSI) Master Format) 11. Waste Baskets.
- e. Waste storage areas – See SECTION 13 – SPECIAL CONSTRUCTION (Division 13 in 2004 Edition (CSI) Master Format) 4.
- f. Additional Manufacturer’s specifications
- Classroom and conference room containers
Busch Systems waste watcher series <http://www.buschsystems.com/recycling-waste-container-bin-cart-products/waste-watcher-series-recycling-container>
 - Desk-Side Recycling & Waste
Busch Systems
<http://www.buschsystems.com/products.html>
 - Public Area Bins
Clean River Recycling Solutions, style: transitions
<http://www.cleanriver.com/products/transition-tim-configurable-recycling-station>
 - Athletic facility public area bins
GreenDrop Recycling <http://www.greendroprecycling.com/stations-2/>



SECTION 12 – FURNISHINGS (Division 12 in 2004 Edition Master Format)

1. The building must include proper pathways for telecom and data. This is addressed in Section 16. The design team must contact the Project Manager.
2. RIT has arranged furniture pricing with certain national manufacturers and has established standard packages for faculty offices, etc. Details on these standards may be obtained from the Project Manager and he/she will coordinate with RIT Procurement Services Office; 585-475-2107.
3. Architect/engineer, furnishings provider, RIT Project Manager and end user to coordinate furniture types and locations with building areas and services for fit and serviceability (i.e. power requirements and receptacle locations etc.).
4. In new building projects, space shall be allowed in each Mechanical room for storage of a 6 foot, 8 foot, and 10 foot fiberglass Type 1A (300 lb capacity) step ladder and chain to secure same. RIT's Project Manager will purchase the ladders.

SECTION 13 – SPECIAL CONSTRUCTION (Division 13 in 2004 Edition (CSI) Master Format)

1. Provide OSHA 29CFR-1910 compliant Fall Protection both inside and outside the building (parapet height of 42 inches, railing, or anchor points), and provide testing of anchor points. Submit testing certificates to Owner at close out. Guards to be galvanized powder-coated finish.
2. Provide building service space to accommodate custodial needs on each floor proximate to rest rooms. Review the equipment needs for each project with the Project Manager and the Manager of Building Services.
3. Provide a separate service entry with loading and unloading area and in multistory buildings located proximate to a service elevator.
4. Include a closet for storing a lamp cart (lightbulbs and ladder on cart) and Universal Waste (spent lamps and ballasts).
5. Include a room for storage/marshaling area for building refuse and recycling waste collection.
6. Roof access shall be by stairs and a door.
 - a. Ships ladders will not be allowed.
 - b. All door heights and widths shall be of sufficient size as to not create a confined space. (Minimum opening shall be 3 feet wide and 5 feet 6 inches high with no more than 6 inches of threshold to step over/up/down.
7. Restrooms-Men, Woman and Unisex:
 - a. Flush valves for closets and urinals: Manually operated flush valves. Use Zurn, Sloan or approved equal.
 - b. Faucets: push button self-closing faucets (metering valve) with separate hot & cold controls (No Battery Operated Faucets). Chicago, American Standard, Sloan (Commercial grade only). Do not use Sloan Model #EAF-150 faucet (grossly expensive battery).
 - c. Ceramic tile floor with epoxy grout.
 - d. No recessed or wall mount waste containers.
 - e. Floor drain with floor properly sloped for drains (for clean machine touch less cleaning operations)
 - f. All bathrooms to have floor drains and wall mounted hose bibs.
 - g. Phenolic partitions preferred, (absolutely no stainless steel partitions), no floor mounted stiles. Owner must approve exceptions.
 - h. RIT will provide toilet tissue dispensers, construction contractor to install. Design professional must include type of dispenser in document to ensure correct space has been allocated.

- i. RIT will provide soap dispensers, construction contractor to install. Design professional must include type of dispenser in document to ensure correct space has been allocated
 - j. Contractor is responsible to provide and install the hand dryers. Current RIT standard: XLERATOR (Model XL-W) by Excel Dryer, Inc. only. Two per restroom or 1 for every 2 sinks if restroom has more than 2 sinks. Design professional must include type of dryer in document to ensure correct space has been allocated
 - k. Contractor is responsible to provide and install the feminine hygiene project disposal bin per stall. The unit will be SS only, not recessed, and must be reviewed with RIT before purchase. Design professional must include type of disposal in document to ensure correct space has been allocated
 - l. Contractor is responsible to provide and install the feminine hygiene project vending unit No recessed Sanitary Napkin Vending Units. . Design professional must include type of unit in document to ensure correct space has been allocated
8. See Owner for the following room requirements:
- a. Custodial Closets: Closets shall have no less than 60 sf in floor area.
 - b. Break Rooms (Custodial, Engineering, Electricians, or Maintenance)
 - c. Custodial Equipment/Storage Rooms
 - d. Trade Equipment/Supply Storage Rooms
 - e. Vending Rooms/Areas
 - f. Recycling and Trash Management Rooms/Areas (Interior and Exterior)
 - g. Collection points on each floor.
 - h. Central place in building.
 - i. No trash compactors
 - j. Universal Waste Storage (closet to hold lamp cart, storage for new & waste lamps).
9. Main Entrance – New Building
- a. Exposed metal structural elements: basis of design is extruded aluminum anodized dark bronze color, heavy duty profile, change to be approved by the Director of Campus Planning & Design Services.
 - b. Doors to be heavy duty high use rating with continuous hinges (see Section 8 – Exterior Doors for hardware).
 - c. Glazing, in addition to code requirements for doors and openings, glazing is to be clear, 3/4” insulated (see Section 8 for window glass and frame profile instructions).
 - d. In addition to being ADA compliant in design each main entrance shall have door opener actuators accessible on approach and exit (see Section 16 – Building Entrances).
 - e. Entrances to have hydronic snow melt systems and walk-off mats (see Section 9 – Entrances for more detail).
 - f. See Fire Alarm and Fire Protection Guidelines for other requirements at main entrance.
 - g. See Section 16 – Electrical for fire alarm and lighting information at main entrances.

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| SECTION 14 – CONVEYING (Division 14 in 2004 Edition (CSI) Master Format) |
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- 1. Do not place Elevator Machine Room next to an office or other quiet area.
- 2. Division 16 to connect electrical power and wiring to elevator controllers and car lights with appropriate lockable disconnects.

3. Definition: Defective Elevator Work: Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
4. Submittals: Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information.
5. Shop Drawings: Show plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, COP drawing with Best brand key switches with their model number and mechanical operation, cut sheet for sump pump with oil sensing switch detail, hall fixture drawings, coordination with building structure, relationships with other construction, and locations of equipment and signals. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support, motor horsepower, motor duty rating, and maximum and average power demand.
6. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, including emergency generator, as shown and specified, are adequate for elevator system being provided.
7. Maintenance and Programming Manuals: Include Operation, Programming, and Maintenance manuals, parts listing with sources indicated, recommended parts inventory listing, emergency instructions, and similar information. Include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel. Submit for Owner's information at Project closeout as specified in Division 1.
8. Inspection and Acceptance Certificates and Operating Permits: provide to Owner as required by authorities having jurisdiction for normal unrestricted elevator use. **Do not** provide a display frame in cab for certificates or permits.
9. Accessibility Requirements: Consultant shall comply with all accessibility requirements, including but not limited to:
 - a. Chapter 11 of Building Code of NY State (which references ICC-ANSI A117.1)
 - b. Latest Section 4.10 of US Architectural & Transportation Barriers Compliance Board's
 - c. "Americans with Disabilities Act" (ADA). Latest edition of ADA Accessibility Guidelines (ADAAG)
 - d. Local codes & governing regulations
10. Maintenance Service:
 - a. Perform maintenance, including emergency callback service, during normal working hours.
 - b. Include 24-hour-per-day, 7-day-per-week emergency callback service.
 - c. Response Time: Two hours or less.
 - d. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months full maintenance service by skilled employees of the Elevator Installer to run in same time frame as warranty period.
 - e. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Provide parts and supplies as used in the manufacture and installation of original equipment. Copies of all monthly maintenance, repair call, and callback slips are to be signed by personnel at the FMS Operation Center. A copy must be left with the Operation Center.
11. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard yearly maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options. Also provide a quote for a five year maintenance agreement
12. Warranty Period: 12 months from date of Substantial Completion.
13. Components
 - h. Pump Units: Positive-displacement type with a maximum of 10 percent variation between no load and full load and with minimum pulsations. Provide motor with soft start solid-state starting.

- i. Hydraulic Silencers: Provide hydraulic silencer containing pulsation-absorbing material in a blowout-proof housing at pump unit.
- j. Casing for Underground Piping (do not use underground piping unless approved by Owner): PVC pipe complying with ASTM D 1785 joined with PVC fittings complying with ASTM D 2466 and solvent cement complying with ASTM D 2564.
- k. Protective Cylinder Casings: PVC pipe casings complying with ASME A17.1, of sufficient size to provide not less than 1 inch clearance from cylinder, and extending above pit floor.
- l. Corrosion Protective Filler: A solvent-less, petroleum-based gel formulated for filling the space between hydraulic cylinders and protective casings. Filler is heavier than water, electrically non-conductive, and liquefies at approximately 150 deg F (Pacific Standard Chemical Co.; Union-Gard 160).
- m. Car Frame and Platform: Welded steel units.
- n. Provide Motion Control Engineering (MCE) microprocessor operation system.
- o. Emergency Lowering: On failure of building power, cars that are at a floor are lowered to the lowest terminal floor, open their doors, and shut down. Cars that are between floors are lowered to the lowest terminal floor, open their doors, and shut down.
- p. Key Switches: All key switch cylinders shall be by Best (except FE0K1 for Fire Service). Cores shall be supplied by Owner.
- q. Provide a Door Hold feature that holds car at floor with doors open and all other buttons and calls inactive except Fire Service and Fire Service Recall. Door Hold keyswitch to be on COP.
- r. Provide Phase I and Phase II fire emergency service per ANSI/ASME A17.1 and any other requirements in accordance with local laws and ordinances. Fire Service key shall be FE0K1. Emergency operation shall be actuated by the operation of three-position (Reset, Normal, Firemen Service) key operated switches located at the Lobby Floor. Fire Service Recall (Phase I): By activation of Fire Alarm System, the elevator will enter into Fire Service Recall and go to the first floor lobby (known as the Designated floor) if any of the elevator lobby smoke detectors on any floor (except the first floor elevator lobby) or any hoistway or elevator machine room smoke detectors are activated. If the first floor lobby smoke detector is activated, the elevator will enter Fire Service Recall and travel to the second floor (known as the Alternate floor). All other smoke detector or fire alarm activations will not affect elevator service (except hoistway or machine room detectors). Upon Fire Service Recall, the Fire buzzer and display lamp in the cab will be activated. If a hoistway or machine room smoke detector is activated, the "Fire" light in the COP and designated floor hall fixture lobby will flash. When Fire Service Recall is activated by the building fire alarm system panel, Fire Service Recall must be manually reset at the first floor lobby after the fire alarm system has been reset. This is accomplished by inserting the FE0K1 key into the Fire Service key switch at the first floor lobby and turning the switch to the "Reset" position and then back to the "Normal" position. The car will then return to normal service, if and only if, the fire alarm system has been fully reset.
- s. Fire Alarm Shunt Trip: If a heat detector in the elevator machine room or hoistway is activated, or if the flow switch for the fire sprinkler line to the hoistway or elevator machine room is activated, the shunt trip breaker supplying electrical power to the elevator system shall be tripped removing power from the elevator system (including Emergency Lowering).
- t. Shunt trip breaker (with auxiliary contacts for lowering system) for elevator shall be located in elevator machine room.
- u. COP layout drawing to be approved by Owner before COP is released for production.
- v. Emergency Communication System: Provide system that complies with ASME A17.1 and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)." On activation, system dials preprogrammed number of monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring station has

- responded. System is contained in COP with identification, instructions for use, and is powered by the telephone line without a battery for memory or any other purpose.
- w. Door Edge Device: Provide electronic safe edge on elevator entrance doors that cause doors to stop and reopen upon detecting an obstruction. Include photoelectric curtain with timed cutout that projects beams across car entrance. The beams, when interrupted, cause doors to stop and reopen. Include Nudging Feature: After car doors are prevented from closing for a predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.
 - x. Floor finish is Norament or Owner approved rubber floor tile.
 - y. Luminous Ceiling: Fluorescent light fixtures using 4 foot T-8 lamps and ceiling panels of translucent acrylic or other permanent rigid plastic complying with flammability requirements.
 - z. Piping: Provide size, type, and weight piping recommended by manufacturer, and provide flexible connectors to minimize sound and vibration transmissions from power unit.
 - aa. Provide dielectric couplings at plunger/cylinder units.
 - bb. Provide vandal resistant signal equipment for elevator with vandal resistant Braille that use LED lamps. Fabricate lighted elements of acrylic or other permanent, non-yellowing translucent plastic.
 - cc. Engrave Fireman's Service instructions into COP above Fire Service key switch.
 - dd. Integrate emergency phone into COP.
 - ee. Elevator unit number to be engraved at top of COP above CPI.
 - ff. Fire Department Communication System (if required): Provide jack in COP and required conductors in traveling cable for fire department communication system specified in Division 16 Sections (if required).
 - gg. Provide waterproof well casings to retain walls of well hole.
 - hh. Install cylinders in well casings. Before installing cylinders, remove water and debris from well casing and provide permanent waterproof seal at bottom of casing.
 - ii. Install cylinders plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor. Seal between protective casing and pit floor with 4 inch of non-shrink, non-metallic grout.
 - jj. Elevator shall have a minimum posted capacity of 3,000 pounds.
 - kk. Elevator depth from inside doors to rail on rear wall shall be no less than 60 inches. Sump pump for the hoistway pit shall be equipped with an oil sensing switch (SEE water Inc. Oil Smart or Owner approved equal).

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| SECTION 15A – MECHANICAL (Division 22 & 23 in 2004 Edition (CSI) Master Format) |
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1. RIT has two main heating and cooling plants. All new buildings must review connecting into the medium temperature hot water plant and chilled water plants for heating and cooling. Direct Expansion coils and Gas Fired systems will be considered only if connection to the plants is not feasible.
2. All new HVAC system design should include a system with main air distribution supplied by an air handling unit(s) with heating and cooling coils, and terminal units- VAV's or induction units are the standard practice at RIT. Any type of heat recovery should be included in the base design where feasible. Design team must review concept with Director of Utilities.
3. All new Air Handling Units should be located inside the building or in a penthouse. If not possible, a utility corridor must be integral to the roof top Air Handling Unit.
4. The Building Management control system on campus is Automated Logic. Please reference the specification in the RIT website.

5. Design must follow the RIT details for building heating and cooling connections to the main plant. RIT will provide the details.
6. Underground valve or metering vaults shall not be installed.
7. Design must follow the RIT details for snow melt. RIT will provide the details.
8. No mechanical equipment shall be hung from the ceiling.
9. Refrigerant (aka Freon) lines shall not exceed 30 foot length (leaks oil and return issues).
10. Butterfly valves shall not be used, except for flow control.
11. Cooling towers shall be dry whenever possible to avoid having to use pesticides and chemicals, as when using a wet tower.
12. Adjustable sheaves are only for balancing and shall be replaced with fixed sheaves after balancing by the mechanical contractor or installer. Fixed sheave information shall be forwarded to Owner.
13. Avoid using di-electric unions, use brass bodied ball valve instead of di-electric union. If di-electric unions must be used, install isolation valves nearby on each side for replacing gasket and washer when they fail.
14. All air filters shall follow the RIT specification;
15. For air handlers 20 HP, or greater, use timing belts instead of V belts.
16. In line circulator pumps shall be Grundfos (ECM if possible) or Taco cartridge type. B&G series 60 type pumps, or similar style pumps shall not be used.
17. Base mounted pumps may be Taco, PACO, or Armstrong. Pumps shall be mounted level on contractor provided concrete base pad such that there is no strain on the pump base. Pump shall be aligned for both vertical and angular shaft alignment. Base shall be filled with grout. Alignment shall be again checked after grout sets and shall have a tolerance of +/- .003 inch.
18. On large air handlers, ductwork connections should always be on the end or top, not the bottom (safety issue).
19. Use the RIT specification for gas, electric, and water meters. Contact RIT FMS directly for these specifications.
20. Standard HVAC design includes VAV boxes with two row reheat coils, DA sensor, and motion sensor input for scheduling.
21. For all external wall assigned occupied spaces, provide fin tube radiation integrated with BAS room temperature control.
22. Include branch dampers on ductwork for balancing, using quadrant locking dampers only.
23. Cabinet unit heaters and/or fan coil units shall be wall mounted (no higher than 48 inch AFF), not in ceilings.
24. All interior lined ductwork shall have stainless steel perforated interior liner.
25. Use of linear supply diffusers is discouraged.
26. Pipe labeling and valve tagging, use RIT guidelines located in the RIT FMS website ([RIT - Facilities Management Services](#)).
27. Where possible, avoid the construction of Confined Spaces – any such confined space that must be constructed, must be approved by Owner in advance.
28. Platforms for roof mounted equipment shall have 24 inches minimum clearance between bottom of platform beams and roof for purposes of re-roofing.
29. Safety railings for compliance with OSHA Fall Protection and compliance with Section 1013.5 of the BC of NY State shall be provided for any rooftop mechanical equipment. In addition, tie-off points shall also be provided as needed.
30. HVAC control panels shall be mounted in mechanical rooms, and no more than 3 feet above finished floor, and shall have Equipment # on panel.

31. Provide insulation on all heating hot water piping, chilled water piping, domestic hot water piping, and roof drain piping as needed. Engineer of record is responsible to provide type of insulation, thickness and R value. Provide a PVC jacket for all piping less than 7 ft AFF, minimum acceptable thickness is 30 mil for light traffic areas and 60 mil for heavy traffic areas.
32. Gauges with ball valves shall be installed on natural gas services at building entrance, before and after any gas regulator, and at each gas appliance.
33. RIT HVAC Equipment Modification form shall be completed and submitted to RIT for projects where new mechanical equipment was installed [RIT HVAC Equipment Modification Form.pdf](#) (see Section 1; Project Close-out).
34. Hydronic baseboard radiant heating equipment shall not be buried, enclosed, or covered by gypsum board.

SECTION 15B - PLUMBING

Avoid using di-electric unions, use brass bodied ball valve instead of di-electric union. If di-electric unions must be used, install isolation valves nearby on each side for replacing gasket and washer when they fail.

In line circulator pumps shall be Grundfos (ECM if possible) or Taco cartridge type. B&G series 60 type pumps, or similar style pumps shall not be used.

1. No trap primers (unless required by Section 1002.4 of PC of NY State), or use above slab external valve type.
2. Minimum floor drains, use deep seal floor drains.
3. For new construction or building exterior renovations- install automatic draining wall hydrant (Zurn Z1321-1X24 or approved equal) on the outside on each face of building (coordinate location with RIT).
4. Roof scuppers – secondary system pipe to daylight.
5. Use the RIT specification for gas, electric, and water meters. Contact RIT FMS directly for these specifications.
6. Use drench hose for emergency eyewash/shower stations (Fisher A112.18.1M).
7. Pipe labeling and valve tagging, use RIT guidelines located in the RIT FMS website ([RIT - Facilities Management Services](#)).
8. Where possible, avoid the construction of Confined Spaces. Any such confined space that must be constructed, must be approved by Owner in advance.
9. Water and gas meter piping must be sketched and approved by Owner before installation.
10. Fire Protection Sprinklers - DO NOT use concealed sprinkler heads.
11. Fire Protection Sprinklers - Refer to Sprinkler System Guidelines on the RIT FMS website ([RIT - Facilities Management Services](#)).
12. Pitch pockets shall NOT be used for roof penetrations for conduit or piping. Cones or "Witches Hats" with a stainless steel "radiator hose" style clamp (with stainless steel worm screw) shall be used. For multiple or large pipes, a "dog house" box shall be used with pipes and conduits exiting the side wall of the box.
13. Equipment shall not be hung from the ceiling (i.e. remote mount cooling unit for water fountain, water filtration systems, etc.)
14. Butterfly valves shall not be used, except for flow control.
15. Provide insulation on all heating hot water piping, chilled water piping, domestic hot water piping, and roof drain piping as needed. Engineer of record is responsible to provide type of insulation, thickness and R value. Where a PVC jacket is used, minimum acceptable thickness is 30 mil for light traffic areas and 60 mil for heavy traffic areas.

16. Gauges with ball valves shall be installed on natural gas services at building entrance, before and after any gas regulator, and at each gas appliance.
17. Plug valves shall not be used on gas lines, use full port ball valves.
18. Gauges with ball valves shall be installed on water services at building entrance, and before and after any water regulator.
19. Water fountains without coolers shall be installed. Water fountains shall have a cup filler. When approved to use Hydration stations, install units that do not have a filter (Elkay EZH2O System - Model #EZS8WSLK) or digital display.
20. Provide water hammer arrestors for restrooms (sinks & flush valves).
21. New buildings will NOT have drain under pedigrig at door. Use 4" deep non-rusting stainless steel pan.
22. Bio-Hazard Labs – Level II – required sink by door.
23. The maximum DHW temperature in buildings is 120 deg F. Any additional temperature required shall be supplied by a booster heater to be part of the equipment being installed.
24. Do not use waterless urinals. Use low flow flush valve on urinals.
25. PEX or equivalent tubing shall not be used.

SECTION 16 – ELECTRICAL (Division 26 in 2004 Edition (CSI) Master Format)

Switching of lighting, and lighting controls, shall be designed with flexibility of operation , maintenance, and energy conservation as primary goals. Constant operation lighting should be minimized per Code requirement and safety needs.

GENERAL

1. Fire stopping shall be performed by Electrical Contractor if the work is only electrical. For new buildings, fire stopping shall be performed by one fire stopping contractor for all trades.
2. When performing demolition work, all conduit and wire not being re-used shall be removed back to the source.
3. Do not use motorized shades.
4. Lighting is not to be controlled by Building Automation Systems, unless approved by the Utilities Director. Lighting control systems are to be kept as simple as possible, code compliant, and shall be reviewed by the Utilities Director.
5. In new construction, addition, or major renovation, provide a closet in project for a lamp cart, new and waste lamp (Universal Waste) storage.
6. All panelboards must be in a location accessible by electrical staff (FA key).
7. Emergency power gensets are to be located inside a room within the building. Exterior and roof mounted gensets are not acceptable.
8. Provide ball valve, on genset muffler and piping drain(s), and piping to within 12 inches of floor or nearby floor drain. 3/4" copper minimum size.
9. All new buildings, additions, major renovations, and new panelboard installations must have short circuit and coordination study work performed with results submitted to the Electrical Department. In addition, an Arc Flash analysis must be performed and labels made. Results and labels are to be submitted to the Electrical Department.

Building Entrance:

1. ADA door operator push button and card reader shall be mounted in an aluminum 4 inch X 4 inch and 50 inch total height light pole (powder coat black finish) mounted to an 8 inch diameter (four feet deep, 2 inch reveal) cast concrete base (Uni-base or cast on site with four 1 inch Schedule 80 PVC conduits (two in – two out) using pole manufacturers anchor bolts) at the main entrance of the building (see Devices in this section for device heights).
2. If Code or local building department regulations require unlocked roof access exits, then any such exits shall be normally held electrically locked, have a by-pass key switch, and be released by the fire alarm system during an activation. The doors shall be posted indicating exit for emergency use only.
3. At least two lighting fixtures at each building entrance shall be powered by the Life Safety (Emergency) power circuit.

Low Voltage – Class 2 (0-50 volts including Fire Alarm Systems):

- Use plenum rated wiring for all low voltage applications not in metal conduit.

Fire Alarm:

1. Fire Alarm Systems – Refer to Fire Alarm System Guidelines in the RIT FMS website ([RIT - Facilities Management Services](#)).
2. Fire Protection Sprinklers – Refer to Sprinkler System Guidelines in the RIT FMS website ([RIT - Facilities Management Services](#)).
3. Place Fire Alarm systems on separate dedicated sheets in drawing set (not on the "Systems" sheets with the rest of the systems i.e. tele/data). As-built Fire Alarm drawings to show conduit routing, devices, address for each device, battery calculations, panel information, conductor quantity, types, and sizes. Drawings to be black and white only, no color.
4. Smoke detectors shall be 3 feet from HVAC Diffusers.
5. Smoke detectors shall be installed in all rooms designated for student occupancy.
6. All fire alarm system wiring shall be installed in RED EMT conduit, no free air wiring.

Low Voltage – Class 1 (50-600 volts):

1. No shared neutrals (unless in plug mold and approved by Owner).
2. Properly sized grounding conductor shall be run with power conductors in all conduits.
3. No conduit less than $\frac{3}{4}$ inch without Owner approval.
4. No cast fittings for conduit.
5. Use acceptable Manufacturers list for electrical products (Contact RIT for latest list).
6. MC cable or flex shall not be used in new or renovation work except for light fixture whips no longer than 6 feet in length. MC cable may be used with Electrical Department Foreman or Director approval in old work.
7. For new buildings, additions, or major renovations, install:

- a. Square-D power logic electric meter (tie-in to Square-D server system, use Belden 3107A E34972 2pr 22ga shld cable). Do not use split core CTs, check phasing, direction, and verify accuracy at installation.
 - b. Water meter with register and pulse output and with bypass valves.
 - c. Gas meter with register and pulse output and with bypass valves.
8. No secondary switchboards shall be placed against building walls, minimum spacing from wall shall be 18 inches.
 9. Provide at least one 120v duplex outlet on e-power in each mechanical, electrical, and boiler room.
 10. Use stranded copper wire on #14 and larger sizes.
 11. Use terminals on #14 wire when used for low voltage (Class II) control work.
 12. Transformers shall be floor mounted on a 4 inch concrete housekeeping pad. Exceptions to floor mounting require Owner approval.
 13. Include enough 120 VAC 20A single pole breakers in panels for HVAC Control Panels.
 14. Include enough space on mechanical room walls for HVAC Control Panels.
 15. Do not use electric in-sink disposal units – require owner approval to be considered.
 16. Provide ball valve(s) on genset muffler drain(s), run to within 12 inches of floor or run to nearest floor drain. Use 3/4" copper minimum size.
 17. Do not use aluminum conductors.

Conduits and Boxes (in Buildings):

1. Do not run conduits in or under concrete slabs or floors.
2. Conduit for Back Up and/or Life Safety Power circuits shall be GREEN EMT. Panelboards for Back Up and/or Life Safety Power circuits shall be painted GREEN. Junction boxes and covers on Back Up and/or Life Safety Power circuits shall be painted Orange for 277/480 volt circuits or Blue for 120/208 volt circuits.
3. Junction boxes and covers on Fire Alarm circuits shall be painted Red.
4. Junction boxes and covers on 277/480 volt circuits shall be painted Orange.
5. Junction boxes and covers on 120/208 volt circuits shall be painted Blue.
6. Include 120 volt circuits for HVAC control panels and to each VAV box with a toggle switch (regular light switch) in a single gang box mounted at each panel and VAV box.
7. Include 3/4 inch EMT conduit and single gang box in wall for HVAC temperature sensor.
8. Use only Scotch 33+ tape.
9. Use Ideal or 3M (but not 3M Scotch Lock) wire nuts.
10. In areas where free air wiring (Telecom/Data) pass over non-accessible ceiling (GWB), install those wires in conduit pathway so that future wires may be added or deleted.

11. No horizontal conduit runs in walls. All runs in walls shall be vertical and have a junction box at the top of the run in the ceiling area above the ACT ceiling.
12. Install appropriate size junction box above accessible ceiling at top of vertical wall conduit runs.
13. All equipment shall have a lockable local disconnect (for LOTO) regardless of panelboard location.
14. Install toggle switch in single gang handy box at each 120 VAC operated smoke damper. This makes for a means disconnect when changing a damper motor.
15. Hand dryers in restrooms require dedicated 120 volt 20A circuit to each dryer.
16. Coordinate 120 volt duplex outlets with furniture layout. Advise Owner of any problems.
17. Pitch pockets shall NOT be used for roof penetrations for conduit or piping. Cones or "Witches Hats" with a stainless steel "radiator hose" style clamp (with stainless steel worm screw) shall be used. For multiple or large conduits, a "dog house" box shall be used with conduits exiting the side wall of the box.
18. Telecom pathways:
 - a. 1 inch EMT conduit from double gang boxes with single gang raised cover mud ring to be stubbed up above ceiling.
 - b. Use a minimum of 1 inch sleeved pathways into spaces from main hallways.
 - c. Review electrical contractor responsibility for Telecom with RIT Project Manager.
19. All conduits (Telecom, low voltage (600v) or medium voltage (12Kv)) entering a building shall be pitched away from the building and shall immediately enter a pullbox in the building. Conduits leaving the pull box shall be higher so that any water entering the pull box via the exterior conduits cannot flow to conduits or equipment inside the building.
20. Include ¾ inch EMT conduit and single gang box for card reader at building entrance.
21. Use Liquidtight Flexible Metallic Conduit (LFMC) for outdoor and damp area applications (motors, rooftop units, lights, etc). Do not use Liquidtight Flexible Nonmetallic Conduit (LFNC).
22. Conduit colors: RED-Fire Alarm, GREEN-Stand by and/or Life Safety Power, BLUE-120/208 volts, ORANGE-277/480 volts, YELLOW-Telecom, and PURPLE/VIOLET-HVAC Controls.
23. Wiremold series 4000 or 5400 shall be used for surface raceway. Other surface raceway systems must be approved by Owner Project Manager and Electrical Manager.

Motor Controls and Variable Speed Drives (VSD):

1. Do not mount any disconnects or motor starters above the ceiling unless approved by Owner.
2. Motor controls shall use LED lamps.
3. All VSDs shall be Danfoss or Sq D E-Flex only. VSDs shall be stand-alone, not incorporated into a Motor Control Centre.
4. Start-up of new VSDs shall be performed by the drive manufacturer or his designated representative. Start-up personnel shall supply Owner wiring diagram showing connections of all auxiliary inputs, outputs, and optional cards (communications, i/o) specific to that installation. Start-up personnel shall also supply Owner with a printout and software copy of attributes programmed into drive.
5. A list of values (other than default) programmed into a VSD shall be supplied to the Owner.

6. Use output chokes (load reactors) on VSD where distance between VSD and motor is greater than 50 feet.
7. VSD shall have removable LCD programming module/display that also stores drive attributes.

Panelboards:

1. Panelboard schedules shall include loads in terms of Horse Power and Amps with total load for the panel indicated per phase.
2. Design firm shall include fuse/ breaker coordination study and Arc Flash study information in close out documents to Owner in both hardcopy and electronic form.
3. Use only bolt-in breakers in panel boards (plug in breakers require approval from Owner).
4. All panelboards shall have lockable door-in-door hinged trim.
5. No panelboards shall be directly surface mounted to walls in mechanical or electrical rooms. Panelboards shall be spaced from the wall using Kindorf (vertically mounted) such that water running down wall will not affect panel.
6. Installing contractor shall provide Owner with panelboard directories in MS Word format on a CD.
7. Rotation shall be clockwise at main distribution panel (and marked on outside of MDP) and at all panelboards.
8. Panelboards shall have copper busses.
9. Use De-Ox or equal on conductors to panelboards 100A and higher.
10. Panelboards shall be Square D, Cutler Hammer, or Siemens.
11. Do not put panelboards in custodial closets.
12. Add (3) empty ¾" conduits & (6) empty 1" conduits to flush mounted panelboards.
13. No stuffing two conductors on single pole breakers.
14. Consult with Electrical Manager for panel nomenclature.

Devices:

1. Device covers shall be unbreakable nylon in Ivory or P&S Light Almond unless otherwise approved by Electrical Department.
2. Construction of new buildings shall include an exterior 120VAC GFCI duplex outlet at each entrance and one outlet on each face of the exterior.
3. Device and Equipment mounting heights (AFF measured from finished floor to device centerline unless noted as otherwise:
 - a. Toggle switches (up is "on") 46 inch.
 - b. Receptacles (ground pin up or to the left) 18 inch.
 - c. Receptacles above counters 8 inch.
 - d. Receptacles above hot water baseboard heat 30 inch.
 - e. Receptacles in hazardous areas, or for refrigerators 48 inch.
 - f. Receptacles, weatherproof, above grade 24 inch.
 - g. Telephone/data outlets 18 inch.

- h. Telephone outlets, wall mounted 46 inch.
 - i. Fire Alarm Pull Stations 46 inch.
 - j. Fire Alarm horns and strobes (match existing or) 80 inch to bottom of device
 - k. Distribution Panels (to top of back box) 72 inch.
 - l. Terminal cabinets (to top of back box) 72 inch.
 - m. Disconnect switches, motor starters, enclosed breakers 48 inch.
 - n. Temperature sensors 54 inch.
 - o. ADA door operator push buttons 40 inch.
 - p. Card reader 40 inch.
 - q. Outdoor pedestal for card reader and ADA door button 50 inch total height.
4. Provide circuit information (panel number and breaker number) on the front of all outlet and switch covers using printed label tape.
 5. Duplex outlets on 120 volt circuit shall be 20A and equal to Pass and Seymour Industrial Spec. Grade #5362 (Warning: Device manufacturers do not use the same terms to describe similar device grades). #5362-AL or #5362-A or equal.
 6. Duplex outlets that are included with furniture shall comply with the device requirements in these guidelines.
 7. Pig tail duplex outlets on all circuits so that neutral and hot conductors are maintained when changing duplex device. Second duplex in quad box need not be pig tailed, daisy chain from 1st duplex.
 8. Provide GFCI 120v service outlets on roof.
 9. Provide weather resistant GFCI outlets for outside GFCI outlets, or outlets subjected to water spray.
 10. Doorbell strobes to be mounted at least 6 feet away from nearest Fire Alarm strobe. Doorbell strobes for offices shall have "auto three flash", residence hall doorbell strobes shall be "push and hold".

Lighting:

1. No batteries in exit lights or emergency lights (except for emergency light by emergency genset).
2. Decorative exterior wall sconces to be: Shaper, 695-WP Series; half pyramid with direct illumination (consult with Owner on lamp type to be used).
3. Install occupancy sensors in corridors for corridor lighting control along with wall switches.
4. Install timer switches on light switches for all closets, mechanical, and electrical rooms.
5. For larger mechanical, electrical, or boiler rooms, provide at least one night light (on 24/7) on emergency power circuit near door.
6. Do not use fluorescent lighting fixtures requiring U-tubes or T-12 lamps.
7. Do not use fluorescent lighting fixtures requiring T-5 lamps.
8. Ensure contract language contains disposal information for waste lamps and ballasts.
 - a. Lamps removed from existing fixtures are to be placed in boxes supplied by Owner. Apply tape to the bottom of the boxes to protect from opening. Boxes must be labeled with "Universal Waste - Lamps" (labels supplied by Owner) and dated by writing on the preprinted label. Also indicate lamp type - fluorescent, HID, incandescent. Pack different lamp types (fluorescent, HID, incandescent) in separate boxes. When a box of waste lamps is full, close the flaps and seal with

- tape. Labeled and sealed boxes of used/waste lamps shall be delivered to Building 99 (call Project Manager to make arrangements).
- b. Old ballasts with cloth covered wires or old ballasts that do not have "No PCBs" on the label are to be boxed only with like kind and returned to Owner at Building 99 (call Project Manager to make arrangements). Boxes are to be labeled with RIT Project Number, RIT building number, and Contractor Name. Magnetic ballasts marked with "No PCBs" on the label are to be boxed only with like kind (no PCBs) and will be picked up by the Owner (call Project Manager to make arrangements). Ballasts labeled "Electronic" are to be boxed only with like kind (Electronic) and returned to Owner at Building 99 (call Project Manager to make arrangements). Boxes are to be labeled with RIT Project Number, RIT building number, and Contractor Name.
9. New fluorescent light ballasts shall be Programmed Start (Rapid Start) type.
 10. Lighting fixtures using lamps of any length other than 4 feet must be approved by Utilities Director.
 11. Do not mount light fixtures in high areas where lamp replacement requires more than an 8 foot step ladder. Any fixtures that must be higher require Owner approval.
 12. Classroom lighting to include:
 - a. Use 3-way light switches for all lighting circuits near teaching station and room entry. Place dimmer(s) at teaching station only.
 - b. First row of fixtures nearest white board shall have all three lamps on dimmer. Balance of fixtures to be inboard/outboard switched, no dimming.
 - c. Appropriate window covering for redirection of ambient light when needed.
 - d. Vacancy Sensor.
 13. Classroom Podium information: (No lighting or up/down screen control in podium, use wall switches only.)
 - a. Location and installation by ETC (after telecom and AV integrator completed).
 - b. Needs 3 conduits from podium to projector (through floor (except slab on grade), up wall, above ceiling):
 - i. One 1 inch conduit for power to feed a 20 amp duplex outlet, same leg as projector, on floor under podium.
 - ii. One 2 inch conduit for Telecom** – 2 live Ethernet, 1 classroom voice line, and 1 CATV line at standard signal level (terminated in standard telecom box with jack and labels).
 - iii. One 2 inch for AV cables to/from projector and wall speakers – will be terminated in RIT standard patch plate/panel box on floor by AV integrator.
**projector coordinates with telecom – must be wired terminated, labeled, and activated before podium installation.
 14. Provide at least one 120 volt electrical outlet connected to emergency power genset in every mechanical, boiler, and electrical room.
 15. Occupancy/Vacancy sensors shall be Watt Stopper or Cooper. Use of any other occupancy sensor requires Owner approval.
 16. Provide an HVAC set of contacts on each Vacancy and Occupancy Sensor (OS). Temperature Controls Contractor to tie-in (provide wiring and programming) HVAC OS contacts with VAV for the area served.
 17. MC cable may only be used in accessible areas on whips for light fixtures and may not exceed 6 feet in length.
 18. Indoor Blue light phone light fixture shall be RAB Lighting VX1F26-3/4, VX100D6, or VBR200DG/F26277.
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19. Tie-off points shall be provided for compliance with OSHA Fall Protection for servicing any rooftop mounted lighting or other electrical or mechanical equipment.
20. Vacancy sensors shall be used in offices, conference rooms, and other non-public areas where an occupancy sensor has been traditionally used (except hallways, see above).
21. Occupancy and Vacancy sensors shall be set for 10 minutes.
22. Place an adhesive Green Dot on the ceiling grid at each light fixture that is connected to genset power. For fixtures not grid mounted, place dot on fixture as per Owner direction.
23. Avoid the use of dimming systems. Dimming systems require approval from the Utilities Director.
24. Use of Bodine relay (or equal) requires Utilities Director approval, and must only be installed in the fixture it serves (label cover).
25. Use twist-lock connectors on each fixture in large assembly areas (gym, etc) or high bay applications.
26. All fluorescent or LED lamps installed shall be 4100K.
27. Do not use any ballasts manufactured by Triad.
28. Install switchpacks or lighting control modules for Vacancy or Occupancy sensors in accessible ceiling location above associated wall switch (not on the deck).
29. Do not use Dimming LED can fixtures (they do not work yet).
30. For fixtures using 4 foot LED retrofit lamps, mark power tombstone using a Sharpie pen with the voltage being supplied.
31. Do not use low voltage (12 volt) track lighting systems or MR-16 lamps.
32. Track lighting to be 120 volt by Halo. No multi-circuit tracks.
33. Do not use LED fixtures. New fixtures are to be fluorescent (4 ft T-8 or CFL) or incandescent with retrofit LED lamps installed. Contact Owner Project Manager with questions.
34. Coordinate furniture and light fixture location to provide for lamp changes in light fixtures.

Medium Voltage – (15Kv):

1. Use liquid filled transformers on all 12kv service and place inside electrical transformer vault inside building. The use of padmount transformers is to be avoided and requires the approval of the Utilities Director.
2. Use single-phase liquid filled transformers on 12kv service of 150kva and higher.
3. Provide containment for oil spills in transformer vault.
4. Transformers to have HV connections on rear side, LV on top.
5. Transformers to have oil sample port, oil fill port, oil level indicator, oil temperature (with max) indicator, oil vac/pressure indicator on opposite side from HV Connections. Removable top.
6. Transformers to be covered by 5 year warranty.

7. Use type SM-4, SM-5, or SMU-20 type fuses in 15kv metal clad switchgear inside electrical secondary switchgear room.
8. 15kv cable shall be General Cable, Kerite, Perelli (Prysmian), or Oakinite and shall be 500Kcmil between manholes.
9. 15kv cable shall be EPR 133% insulation level (220 mil), MV-105, with 5 mil copper tape with a minimum of 20% overlap, and with flame retardant, moisture and sunlight resistant PVC jacket.
10. Use only Elastimold Series 600 Deadbreak bolt-together tee type splices in 12kv manholes.
11. For underground conduits, use Schedule 40 PVC conduit. Transition to RGS sweeping elbow when rising above grade or entering building. Encase with 6 inch of concrete on all four sides. Provide 4 feet of cover by backfilling in 12 inch lifts with compaction between lifts. Provide 8 inch of top soil in lawn areas.
12. No medium voltage equipment is to be placed against building walls, minimum spacing from wall shall be 18 inches.
13. All medium voltage wiring used for connections between transformers (feeds and interconnections) and switchgear shall be a shielded type.
14. Load Interrupters shall be located in a separate room from the transformers (locate load interrupters in secondary switchgear room). Load Interrupters shall have IR inspection windows.
15. Always install double the number of conduits needed for 12kv service (if 4 are required, install 8 conduits).
16. Use only fiberglass and stainless steel hardware on 12kv wire racking materials in manholes.

Site Electrical Systems: (Division 33 in 2004 Edition (CSI) Master Format)

1. Utility line depth (also see drawing details):
 - a. Conduit for roadway or walkway lighting – 18 inch cover.
 - b. Conduit for 12KV – concrete encased 6 inch all sides, 4 feet cover over concrete.
 - c. Conduit for Telecom/Data – 3 feet cover.
2. Use Kistner Uni-bases for outdoor light poles – expose only 4 inch with 8 inch of top soil as shown on RIT detail – do not use leveling nuts to true poles (use washers or shims).
3. Use Schedule 40 PVC conduit for underground use. Transition to RGS sweeping elbow when rising above grade.
4. All light poles shall be powder coated black finish unless stated and approved otherwise by Owner.
5. Use type THHN stranded copper wire for low voltage class 1 (600v) electric service in underground conduits, and no smaller than #10 AWG.
6. Handholes are to be avoided. No small round hand holes are to be installed. Quartzite or equal (subject to Owner approval) are to be used.
7. Use only scotch 33+ tape on class 1 and 2 systems.
8. Use Ideal or 3M (but not 3M Scotch Lock) wire nuts.
9. For lawn repairs due to trenching, boring, or other digging, include 8 inch top soil, dressing, and seeding to restore lawn to original conditions with 1 year warranty against settling.

10. For walk or road repairs due to trenching, boring, or other digging, include any pavement repair to original conditions with 1 year warranty against settling.
11. For site power with wire sizes #10awg and #12awg use 480/277 volt colors or 208/120 colors as needed.
12. For site power, splices are only permitted in poles or existing hand holes.
13. Outdoor Blue light information:
 - a. Blue cubes from Laird Plastics (585-254-8110).
12 inch square used on building mounted Blue Lights 16 inch square used on all other locations
¼ inch (.250) thick Blue plastic - color #2051
9 inch diameter hole.
 - b. Light fixture for top of pole (4 inch square) is a Pemco CRY2-X-70MH-120/277 top cap assembly without cube.
 - c. Light fixture on wall mount bracket is a Pemco S410-A/125 - Powder Coat Black finish used with a Pemco CRY2-X-70MH-120/277 top cap assembly without cube.
 - d. If mounting to an existing round pole, a back panel/bracket must be installed on pole prior to mounting phone and or light mounting bracket.
 - e. Use Kistner Uni-base, and 10 feet tall 4 inch square pole (power coated Black) by Flagpoles Inc.
 - f. Use Ramtel Model RR733 phone in Ramtel Model 926-D enclosure.
 - g. Contact RIT for cut sheets.
14. Decorative site poles use AAL SP1 indirect with full cut off fixtures with 150 watt MH lamps. Handhole in pole shall be 12 inch above base so that decorative base cover may be installed. A GFCI duplex outlet shall be 18 inch above base on all poles. Contact RIT for spec sheets.
15. All light pole bases to be installed with 4 inch of base exposed, and a minimum of 8 inch of top soil. Shims are to be used to level poles. Leveling nuts shall NOT be used.
16. Photo cells (with by-pass switch) shall be used for exterior lighting control. Time clocks shall not be used.
17. A minimum of .5 fc shall be between lighting poles.
18. Use 30 inch diameter manhole rings and covers for all manholes.
19. Use pre-cast rings (concrete or plastic) for all manhole risers...do not use brick.

Site Telecom Systems

1. Use Schedule 40 PVC conduit for underground use. Transition to RGS sweeping elbow when rising above grade. Provide 3 feet of cover.
2. Pull in a tracer wire of single conductor #10AWG solid copper insulated (THHN) wire in all conduits, terminate at top of manholes so that entry is not required.
3. Use 30 inch diameter manhole rings and covers for all manholes.
4. Use pre-cast rings (concrete or plastic) for all manhole risers...do not use brick

SECTION 17 – DATA TELECOM (Division 27 in 2004 Edition Master Format)

1. Reference Communication Cabling Guidelines on RIT FMS website
<http://www.rit.edu/fa/facilities/sites/rit.edu/fa/facilities/files/docs/cabling.pdf> .
2. Blue Light phones are Ramtel Model RR 734 (Dial Pad & optional Red 2 inch E-Button) or RR 733 (with optional Red 2 inch E-Button only) with Model 906 Flush Mount Box.
3. In office areas, each desk shall have two data and one voice jack planned.