Palomar Community College District

DISTRICT STANDARDS for DESIGN and CONSTRUCTION Projects

December 2010

INTRODUCTION

This standards manual is prepared by the Palomar Community College District in an effort to assist project architects and engineers to understand the minimum standards for design and construction projects.

It is intended that a copy of these guidelines be printed for each project and presented to the project architectural / engineering / design teams. Palomar Community College District representatives will be responsible to confirm that the project design team addresses each item presented herein.

This information is intended to aid the teams in understanding the expectations of the College for the design and construction of each project or facility. It is not the purpose of this document to relieve the project design team of their responsibility to seek out the best engineering or architectural solutions for this project. It is the duty of the project architect to make certain that the project goals of quality, function, durability, aesthetics, budget, and schedule are best served by the design and specifications applied toward each project. The architect of record must bring to the District's attention any elements of this design that vary from the information contained herein.

It is not the intention of the District to alter any contractual or legal obligations of the College or the architect by reason of the information contained in this document. The architect shall bring to the attention of the college any issues that may affect a contract term or condition.

The specification titles and numbers listed in the Table of Contents are taken from the year 2008 version of the Master Format and may not reflect the actual titles and numbers of the sections used by the Architect and Engineers. The college recommends the use of Master Format as a guide for the preparation of project specifications.

If the college has no minimum standards for a particular specification section, the Table of Contents will include a 'No Special Requirements' following the specification title and the section will not be included in the guidelines. Other sections listed in the Table of Contents will be included in the guidelines with the college minimum standards. Many sections that have been considered not applicable for the college projects are not listed in the Table of Contents.

All work performed on any Palomar Community College District campus shall comply with all Local, State and Federal Regulations.

The guidelines are prepared from past experiences with materials and recommendations from consultants and Palomar Community College District. If, in the course of any design phase of the projects, if the Architect or Engineer must deviate from these Guidelines, the issue should be brought to the attention of Palomar Community College District for consideration and approval. If the Architect or Engineer should find a particular guideline not in the best interest of the college, they shall bring the issue to the attention of Palomar Community College District. If the architect or engineer should find a product or construction practice that should be considered for the guidelines, it would appropriate to bring the issue to the attention of Palomar Community College District for consideration.

These guidelines are not prepared to restrict the architect or engineer from any design considerations but merely to assist the design team in choosing products or systems that have performed well for the college in recent past projects.

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DIVISION 1 – GENERAL

1.01 GENERAL

All new buildings must comply with all the applicable codes sections and authorities having jurisdiction on the campus, namely DSA. The local fire authority shall be engaged for site access only. Other authorities, such as the Health Department may be engaged and necessary. Note that it is the responsibility of the project architect to consult and submit necessary submittals to ALL agencies having jurisdiction over each project.

1.02 REMOVAL AND SALVAGE OF ANY MATERIALS

The District shall maintain rights to any salvaged materials or item to be removed in any project requiring demolition. Verify with the District in each case.

1.03 SUBMITTAL REQUIREMENTS

.01 At Palomar College the following submittals are required in addition to the submittals to the District, Palomar College and the Chancellor's Office.

a. Department of State Architect (DSA)
b. City of San Marcos Fire Department – Access and Fire Hydrant Locations only
c. Master Architect – LPA, Inc.
d. Any other required agencies having jurisdiction.

Beyond the required listed submittals above, regular submittals to the District, Campus and the Chancellors' Office may be required. Verify requirements and methods of submittals with the District.

1.04 LANDSCAPE DEMOLITION AND PLANTING REMOVAL

.01 Verify all planting material removal with the District. There are specimen trees such as the Mexican Blue Palms which are considered specimen trees at the District. Prior to final release of the demolition of the planting, the District must be notified.

END OF DIVISION 1

DIVISION 2 – SITE WORK

2.01 REMOVAL OF HAZARDOUS MATERIALS

District will arrange for a consultant employed by the District to provide surveys and reports as required for each case. The hazardous material removal is normally a part of the Demolition Plan issued with the Bid Document – verify with the District in each case.

2.02 DEMOLITION

.01 Verify with District for any salvageable items which they may want to retain.

.02 Verify existing utilities in and around project site. Note that there are transite pipe in use at Palomar College. Provisions should be made for proper removal and disposal of these pipes. Record Documents are not always accurate. Field verify with surveyors wherever possible.

2.03 EARTHWORK

.01 Geotechnical Report shall be issued as a part of the Bid Documents. Obtain copies of Geotechnical Reports from the District.

.02 Note that the "Blue Granite" is present at very shallow depths at Palomar College. As a result, it may be necessary to blast the granite for utilities and footings. Verify requirements with Geotechnical Engineer and the Civil Engineer.

.03 Make provisions for imported suitable backfill material at all retaining walls and wherever it may be required.

2.04 ASPHALT CONCRETE PAVING

.01 Aggregates: Use 1/2" max size for walks. Use 3/4" max size for parking lots. Verify actual requirements with the Geotechnical Reports.

.02 Use asphalt emulsion seal

.03 Use minimum thickness of 2" overlay. Do not install Petromat fabric between the existing and new paving, unless specifically authorized by the District. Verify actual requirements with the Geotechnical Reports.

.04 Properly prepare existing paving to be resurfaced. Use tack coat to assure bond between new and existing. Large areas to be resurfaced shall be prepared by grinding to assure bond.

.05 Specify final fog coat for all paved areas prior to final acceptance.

.06 Locations of speed bumps shall be coordinated with the District. Stripe each speed bump in yellow for visibility.

2.05 PAVEMENT MARKING

.01 Use single white lines for parking stalls, white for temporary loading areas and double yellow lines for the median of the "loop" road. Use only water based traffic type paint.

.02 All accessible parking stalls and associated striping must comply with accessibility requirements. Provide standard accessible signage on the paving with blue paint. Do not paint "VAN ACCESSIBLE" on the pavement - incorporate it into the required accessible sign in front of the van accessible stall. Refer to Chapter 11 of the California Building Code (CBC).

.03 Provide directional arrows on the pavement as indicated by the District. Provide left/right turning lanes as required.

.04 Specify reflectors @ 100'-0" o.c. at the "loop" road – white. Provide blue reflectors at fire hydrant locations. Locate them at the center median.

.05 At all stop sign locations specify 12" thick white line – comply with all street signage striping requirements.

.06 Provide striping and signage at all pedestrian crosswalks

2.06 SITE CONCRETE WORK

.01 Concrete mow strips are to be located wherever turf is adjacent to a vertical surface. Provide a minimum 8" deep by 6" wide mow strip.

.02 Provide reinforcing steel in all linear concrete items such as curbs, mow strips, etc. to minimize cracking. Refer to Geotechnical Report for reinforcing requirements. Provide control joint as required.

.03 Differentiate pedestrian paving from vehicular traffic and provide paving recommended by the Geotechnical Report. Paving areas associated with Fire Access lane shall also meet the requirements of City of San Marcos Fire Department.

.04 Provide doweled expansion joints at existing adjacent surfaces. Also provide dowels at sidewalks and curbs. Provide thickened edge at all site concrete paving.

.05 For design continuity, new concrete paving shall relate to the existing campus pallet of concrete colors and finishes. Where appropriate, match adjacent finishes and colors.

.06 Where retaining walls are required, provide medium sandblasted finish. No integral color concrete. Provide control joints and reveals as necessary for design and as required for structural reasons. Other forms of retaining structure should be explored to reduce cost and also for aesthetic (design) reasons. Natural concrete color is highly recommended.

.07 All parking stalls shall be provided with a pre-cast concrete wheel stop where curbs are not necessary. At spaces with curb, verify wheel stop requirement with the District. Wheel stops shall be mechanically fastened in place.

.08 Where low concrete walls or concrete seat walls are provide, design in anti-skateboarding notches. Avoid surface applied solutions.

2.07 SITE SIGNAGE

.01 Provide site signage in accordance to District Signage Program

.02 Specify temporary construction signage for all Bond-Funded (voter approved Measure M) projects designated by the District. Consult the District for District's standard project identification sign. The signage should be visible from a public way. This can be a part of the Bid Document requirements for the contractors to provide.

.03 Provide site signage as required by Code in accordance with the District Signage Program – see attached signage program.

.04 Additional directional signs may be required to direct both vehicular and pedestrian traffic. All such sign shall be coordinated with the District and the Campus. These directional sign shall match the existing signage palette. Refer to Design Guidelines for more information.

.05 Inform all Contractors regarding Contractor signs. Signs promoting or advertising for the Contractors are not allowed. All Contractors must provide their own construction delivery signs or route of travel signs.

2.08 SITE LIGHTING

.01 At the existing central pedestrian walkways and spaces immediately adjacent, match the existing light fixtures.
.02 At all parking lot areas, match existing parking lot fixtures.
.03 No up-lighting unless completely shielded by building element
.04 Provide light fixture complementing the existing palette of light fixtures

All exterior lighting system for all campuses shall be governed by the building Energy Management System (EMS) or by lighting control panel. Verify parking lot and pedestrian light lamp and ballast with District.

For other building related lights refer to Division 16.

2.09 SITE FURNISHING

.01 Benches – 6-foot long contour bench
.02 Bike Racks – 7-bike capacity model
.03 Trash/Ash Combo – Aluminum/stainless steel finish type for low maintenance
.04 Tables – with 2" Umbrella hole. Provide required number of accessible tables.
.05 Umbrella to be durable low maintenance type with 1-1/2" diameter pole
.05 All exterior directories shall conform to Campus Signage program. Vending machines and newsstands shall be located at designated locations only. Verify with the District.

The District may elect to provide the site furnishing as a part of Group II equipment rather than as a part of Group I construction. Verify with the District.

2.10 CHAIN LINK FENCE

Use galvanized, minimum 9 gauge wire, top and bottom rails and infill with redwood slats or "green" screen. Use swinging gates for pedestrian access, not rolling types. For vehicle access, rolling gates shall be ground supported type, not top rail supported. Provide all manual gates with padlock – locking mechanism to conform to District's Schlage "Primus" system – no exceptions.

Use of chain-link fencing should be limited. Avoid using this as a permanent fencing at the college.

2.11 GATES

Verify the requirements for gates with each project with the District. Should a gate be required, provide a locking mechanism – it may be integral or hardware accepting padlocks. In either case the locking system must conform to District's Schlage "Primus" system – no exceptions. Verify existing gates on each campus and match existing.

2.12 DRAINAGE SYSTEM (STORM DRAINS)

.01 Specify campus standard catch basins along the "loop" road – match existing. The catch basin shall be per APWA 300-2 (w=3.5' and V shaped or as required).
.02 At certain areas, the existing system may intrude into the road base section. At all such areas protect the existing storm drainpipe with "Tensar BX1100 Geogrid" or equivalent. Verify exact requirements with the Civil Engineer.
.03 Specify a manhole and cover where the new system ties into the existing system.
.04 Specify 12" x 12" atrium type area drain grate at all landscaped areas (NDS). Provide flat grates at all turf areas – either NDS 1211 or NDS D12H as required. Color shall be green.

.05 All area drains are to be located in the landscape area. Should a drain be required at paved areas, provide trench drains at discrete locations. Specify Aluminum Metagrate MLG-4-S w/trench liner with ½% slope minimum and concealed locking mechanism as manufactured by Balco Metalines or equal – mill finished. Provide traffic rated boxes where required.

.06 Depending on location, provide French drainage system at underground locations – where the "Blue Granite" meets the native soil or engineered fill. This is to mitigate water migration along the "Blue" Granite and possibly affecting the ground floor finish negatively.

2.13 FLAGPOLES

.01 Review requirements for flagpoles with the District

2.14 IRRIGATION SYSTEM

Design irrigation system such that the water would be sprayed away from the building. Drip irrigation system is highly encouraged immediately next to the building.

.01 Use the following pipes.
- a. PVC Class 200 pipe for all irrigation lateral lines – if exposed to sunlight, use Schedule 40 UVR.
- b. PVC Schedule 40 for irrigation mainlines 1 ½" and smaller.
- c. PVC Class 315 for irrigation mainlines 2" up to 3" in size.
- d. PVC Class 200 bell and gasket mainlines for 4" and larger – use Leemco pipe restraints.

.02 Controllers
- a. The District is currently utilizing Hunter controllers but verify with the District.
- b. The District is looking to incorporate next generation standalone controller with remote access and satellite information feed. District shall be engaged for subscription information prior to final design. Such system shall be approved by the District.

.03 Valves should be brass, not plastic. Valve boxes and numbered covers shall be strong enough not to break or deform when motorized vehicles run over them. Such boxes shall be set in a gravel base with sufficient compaction to preclude settling when run over by motorized vehicles.

.04 Provide sleeves where pipes run under concrete walks. Pre-assembled triple swing joint should be specified for all sprinkler heads. Use threaded risers only for connections to the pipe, so they can be replaced. Provide water hammer arresters on all systems. Provide irrigation to all planting, even drought resistant types.

.05 Wiring from controller to valves shall be direct burial. Place directly under main line to valves or provide Schedule 40 PVC buried conduit for wiring. Minimum depth shall be 12".

.06 On slopes surface-install the pipes and heads. Anchor with appropriate methods. Do not use any material made with wood.

.07 Verify with the District for the irrigation heads.
- a. Spray heads for small turf areas shall be reviewed with the District.
- b. Spray heads for small shrub areas shall be reviewed with the District.
- c. Bubblers within deep tree wells shall be reviewed with the District.
- d. Drip tubing shall be Toro DL2000 or equivalent drip tubing for shrubs and Ag-Products or equivalent for PVC to drip connection to allow for maintenance of systems.
- e. Toro YD-500-3/4 Air/Vacuum relief valve or equivalent for DL2000 system – provide one at high point of each planter.
- f. Toro FCH-H flush valve or equivalent at ends of tubing runs for flushing drip system.
- g. Febco 825Y or equivalent backflow preventer with Mod. 650 wye strainer.

h. Rain Bird PEB-PRS-D series or equivalent plastic valve for regulating master valve.
i. Irrigation controller with flow sensor shall be specified within a stainless steel enclosure.
j. VIT Strong Box SB-16SS top-entry stainless steel or equivalent enclosure for controllers.
k. VIT CSA sub-assembly or equivalent for controller enclosure.
l. VUT RGVRSS or equivalent rain shut-off device enclosure.
m. WCS rain shut-off device, model RG-DCC or equivalent.
n. Watts S-FBV series or equivalent stainless steel ball valve – size per line size.
o. Rain Bird 44DLRC or equivalent quick coupler, spaced at 100'-0" o.c. along entire length of the main line.
p. Rain Bird PEB-PRS-D series or equivalent plastic pressure regulating remote control valves.
q. Paige P-7171-D or equivalent communication cable.
r. 3M DBY or equivalent wire connectors for all wire connections.
s. #14UF AWG irrigation control wires.

2.15 LANDSCAPE PLANTING

.01 The Palomar College is considered an active arboretum. Verify all planting species with the District but native/drought-tolerant species are highly recommended. Avoid large turf panels.
.02 Verify that the planting palette is complimentary to the existing adjacent planting palette.
.03 Avoid planting trees closer than 15'-0" to the building
.04 Provide linear root-barriers, if the trees are planted less than 10'-0" from any sidewalk or paved surfaces.
.05 Stake and guys all trees an required
.06 Any trees 15 gallons or larger should be provided with "sump pit/trench" with filter fabric-wrapped perforated drain pipe.
.07 Wherever possible provide signage for each plant material for education purposes. Include Latin and common names.

a. District accepted TREE is as follows:

Schinue molle/California Pepper
Acacia baileyana/Mimosa Tree
Pinus spp./Pine
Melaleuca quin quenervia/Cajeput Tree
Eucalyptus spp./Eucalyptus
Liquid amber styraciflva/Sweet Gum Tree
Tipuana tipu/Tipu Tree
Platanus racemosa/California Sycamore
Betula nigera 'jacquemontii/Birch
Koelreuteria paniculata/Goldenrain Tree
Platnus acerifolia 'Columbia'/London Plane
Melaleuca linariifolia/Flexleaf Paperbark
Ulmus parviforlia 'True Green'/Evergreen Elm
Lagerstroemia indica 'Natchez'/White Crape Myrtle
Phoenix dactylifera 'Medjoo"/Date Palm
Salix lasiolepis/Arroyo Willow
Salix gooddingii/Black Willow

b. District accepted SHRUB is as follows:

Buxus microphylla Japonica 'Green Beauty'/Green Beauty Japanese Boxwood
Camellia sasanqua 'Tanya'/Camellia
Pittosporum tobira 'Variegata'/Variegated Mock Orange
Lantana montevidensis/Purple Lantana
Rosa x 'Noaschnee'/Flowering Carper 'White'
Acacia redolens/Acacia
Rhamnus californica 'Little Sur'/Coffeeberry
Trachelospermum jasminoides/Star Jasmine
Iris douglasiana/Douglas Iris
Dietes 'Bicolor'/Bicolor Iris
Pennisetum setaceum 'Rubrum'/Purple Fountain Grass
Rhus integrefolia/Lemonadeberry
Parthenocissus tricuspidata/Boston Ivy
Lonicera hildebrandiana/Giant Burmese Honeysuckle

c. Ground cover shall be Potentilla verna/Spring Cinquefoil
d. Turf shall be Marathon III. See Item .10 of this section below.

.08 Retention Basin Planting:
a. Trees shall be fifty percent (50%) 5-gallon Salix lasiolepis/Arroyo Willow and fifty percent (50%) 5-gallon Salix gooddingii/Black Willow.
b. The basin should be and encouraged to be turf. Hydroseeding is not recommended. But if hydroseeding becomes necessary, provide green mixture. Irrigation system may be required.

.09 Campus Perimeter Planting:
a. Slope facing towards the public street or 50% of perimeter planter on the public street side shall complement existing planting.
b. Slope facing towards the college campus or 50% of the perimeter planter on the campus side shall compliment on-site adjacent planting.

.10 Sport Field:
a. Verify with the District for the species if natural turf. Also verify artificial turf with the District.
b. Shrub planting shall be from approved planting pallet.

.11 On-site Slope Planting:
a. Trees shall be from approved planting pallet.
b. Shrubs shall be from approved planting pallet.
c. Specify Jute-Mesh for any slope greater than 3:1. Install perpendicular to the slope.

.12 Soils Report must be submitted to the Landscape Architect along with soils amendments appropriate for the given soils samples. Multiple samples should be taken from planting area throughout the project. Follow up soil report is required after planting.

.13 Do not plant trees on top of existing utility lines or structures. Provide adequate distance from existing utilities structures when planting trees.

2.16 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

.01 As a part of the Bid Documents prepare and issue Storm Water Pollution Prevention Plan (SWPPP). SWPPP must contain BMP (Best Management Practice) for during and post construction. SWPPP shall be comprehensive and shall be enforceable. Please note that State and local requirements regarding storm water is constantly changing. It is the District's assumption that the design professionals are current with the latest regulations and requirements and will specify the appropriate measures for the given project.
a. With the new regulations governing the SWPPP the Regional Water Quality Control Board

(RWQCB) is more active. All projects starting after September 30, 2011 will adhere to the requirements. It is expected that no project at the District will be higher than Level 2 as stipulated by RWQCB.

.02 The SWPPP shall specify that the regular (weekly at a minimum) sweeping of the project site along with areas immediately surrounding the project site.

.03 The Contractor shall employee a responsible person properly certified by the State for this effort or the Contractor shall obtain a services of an entity properly certified by the State. If Construction Manager is overseeing the project, The Construction manager shall make provisions for such effort.

.04 Water Quality Management Plan (WQMP) is required for every new building project in the District.

2.17 EXISTING CONDITIONS

.01 Obtain Civil Engineering services include verification of existing utility at the project location. In addition to obtaining Record Documents from the District, consultants specializing in locating existing utility should be obtained with District approval. Such consultants should be engaged early in the design process. This is intended to design site utility infrastructure to a known connection point rather than relying on Record Documents, which may proved to be inaccurate and ultimately lead to Change Orders in the field.

.02 Confirm and verify the information obtained and share the information with the District. Include all such information as a part of Record Documents to the District.

END OF DIVISION 2

DIVISION 3 – CONCRETE

3.01 CAST IN PLACE CONCRETE

.01 Use concrete having minimum 3,000 psi compressive strength for all slabs on grade, minimum 4 inches thick, minimum No. 4 bars at 18" o.c. Review with Structural Engineer and conform to recommendations of Geotechnical Report for each case.

.02 Concrete mix and curing shall provide for low vapor emission prior to flooring placement. Wet curing is encouraged wherever possible. Verify vapor sensitive flooring materials at all ground floor locations with Division 7.

.03 Seal site concrete for maintenance. Seal all exposed building slabs. Do not leave concrete untreated inside the building.

.04 Use a heavy-duty vapor retarder below on-grade slabs. Do not use "Visqueen" or other unreinforced vapor retarders. Provide minimum of 20-mil vapor barrier equal to products manufactured by Stego Wrap.

3.02 INTERIOR CONCRETE CURBS

.01 Integral concrete curb is required all interior restroom, janitor closet locations or any other "wet" locations (minimum of 4" high – 6" high curbs are preferred).

3.03 VAPOR EMISSION AND ALKALINITY CONTROL

.01 Provide testing and remediation procedures for areas to receive non-breathable flooring coverings including, but not limited to thinset ceramic tile, resilient tile, sheet vinyl, carpet and resinous coatings. Provide at all floors, including the upper supported slabs.

END OF DIVISION 3

DIVISION 4 – MASONRY

4.01 CONCRETE UNIT MASONRY

.01 Color and type of the concrete unit masonry should be chosen to compliment the existing campus and the adjacent buildings. Use of "Dry" block is encouraged.

.02 At all openings in the masonry wall, use the "U" lintel blocks at the head condition and 2" cap block at all sill conditions and at all top of masonry parapets.

.03 Compatible water repellent coating must be provided at all exterior surfaces. At masonry parapets, coat both sides. If racked joints are specified, it must be given special attention to eliminate possible water intrusion. See Division 7.

.04 At all interior exposed block surfaces provide coating similar to "Stain-Barrier" manufactured by ProSoCo. See Division 7. Verify with college regarding anti-graffiti coating.

END OF DIVISION 4

DIVISION 5 – METALS

5.01 METAL FABRICATIONS

.01 All exposed interior metal shall be designated AESS (Architectural Exposed Structural Steel) and shall be specified to be finished accordingly.

.02 Provide anodized finish in case of aluminum or stainless steel (#4 finish – do not specify #8 finish). Painted guardrails and handrails should be avoided for maintenance reasons but it may be required for budgetary reasons. When required painted guardrail/handrail shall be AESS finish with sprayed applied paint.

.03 At all exterior locations galvanize all exposed exterior steel items.

.04 Standardized handrail and guardrail system matching other existing design already on campus are highly encouraged. Prefabricated and field assembled systems are encouraged. Painted handrails or guardrails shall be used sparingly. Brush aluminum or #4 stainless steel are encouraged. Exterior handrail/guardrail can be un-painted if galvanized.

5.02 STEEL DECK

.01 Use of ventilated steel deck is encouraged at all supported floor systems. Verify with Structural Engineer for exact requirements.

5.03 ORGANIC COATING SYSTEMS FOR METALS

.01 Aluminum Glazing System, including but not limited storefront system, curtain wall system, automatic entry doors and other accessories items to the curtain wall system such as louvers, sun shading elements shall be finished with organic coating system.

.02 Minimum of 70 percent polyvinylidene fluoride (PVDF) resin by weight is required. Minimum of 1.0 mil thickness is required.

.03 Provide product equal to Kynar 500 or Hylar 5000.

.04 Provide the following minimum warranty.

Product complying with AAMA 2603:

a. On Aluminum: 2 years
b. On Galvanized and Ungalvanized Steel: 1 year

Product complying with AAMA 2605:

a. On Aluminum Extrusions: 20 years
b. On Aluminum Brake Metal Only: 5 years
c. On Perforated Aluminum Panel: 5 years

END OF DIVISION 5

DIVISION 6 – WOODS AND PLASTICS

6.01 ROUGH CARPENTRY

.01 Wherever possible and when not required for structural reasons, do not use plywood or OSB as substrate at exterior locations.

6.02 ARCHITECTURAL CASEWORK

.01 Use laminated plastic typically with "color-through-the-core" on all casework in public spaces, meeting/conference rooms and specialty areas. Use Woodwork Institute Custom grade in all locations except laboratories. Use Laboratory grade in laboratories.
.02 Use 3 mil polyvinyl chloride edge banding attached with hot melt adhesive on drawers, shelves and doors. Use one mil PVC edge banding on edges of case bodies, attached with hot melt adhesive.
.03 Wood veneer should be considered on a project basis. Species shall be compatible and coordinated with other interior/exterior finishes.
.04 Use concealed hinges are discouraged although allowed.
.05 Use "Accuride" full extension heavy-duty drawer slide capable of supporting 75 pounds. File drawers must be capable of supporting 100 pounds. Pencil drawers must be capable supporting 50 pounds.
.06 Provide products similar to Pendaflex G-6110-04 (WH) file railing system at all file drawers.
.07 Provide locks at 100% of the drawers and doors or as requested by the District. Key alike per room or as requested.
.08 WIC certification is required at all millwork.
.09 All cabinets are to be MDF or plywood. Particleboards should be avoidd.
.10 Interior of the cabinets should be melamine at a minimum.

6.03 COUNTERTOPS

.01 Provide durable countertop surfaces such as through the core laminates, Corian or other solid surfacing material and stone.

END OF DIVISION 6

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

The District is extremely sensitive to water penetration/protection. Carefully consider all moisture sensitive design, details and specifications.

7.01 CEMENTITIOUS FIREPROOFING

Use only cementitious type such as Monokote and do not use types that are "hardened" by application of coatings to soft materials. Intumescent Fireproofing System is acceptable.

7.02 ROOFING

.01 For new construction, in areas utilizing built-up roofing, specify reputable manufacturers. Stay away from smaller manufacturers. For repairs and minor modifications, match existing built-up roofing. Provide 10 plus 10 year manufacturer, no dollar limit warranty. Provide white cap sheet.

.02 Single-ply PVC roofing system such as Sarnafil is encouraged. The warranty should be non-prorated 20-year parapet to parapet system warranty including the flashing system.

.03 Standing seam metal roof, elastomeric fluid applied roofing system and other appropriate roofing system can be considered.

7.03 FLASHING AND SHEET METAL

.01 Use minimum 22 gauge galvanized sheet metal material. Modifications and repairs should match existing.

.02 All joints in sheet metal shall be continuously soldered.

a. Paint exposed sheet metal.

.03 All roof penetrations shall be round. Do not use square/rectangular roof penetrations. Do not use uni-strut or other non-round elements to penetrate the roof. DO NOT use pitch pans/pockets.

7.04 WATER REPELLENTS

.01 Where masonry units are used specifye compatible water repellent coating. Manufacturer 's field test and quality control must be a part of construction process. Minimum of 5-year warranty is required.

.02 Verify with the District regarding anti-graffiti coating requirements.

7.05 COMPOSITE ALUMINUM PANEL SYSTEM

.01 Composite aluminum panel system is utilized on other existing campus building. Verify that the color and type is appropriate for its use and compliment surrounding buildings. Avoid "shiny" finish and provide organic coating finish wherever possible.

7.06 ROOF HATCH

.01 Roof hatch shall be high security, self-flashing, integral curb type.

.02 The minimum size shall be 30" x 36"

.03 Provide "Ladder Safety System" equal to LadderUp LU-1 manufactured by Bilco or Railok Safety System by Sinco Products.

.04 Safety system should include steel rail, splice plate, rung clamp, extension support, climbing sleeve, safety belt, lifeline and other items for a complete system.

.05 Paint roof hatch white.

7.07 BUILDING INSULATION

.01 Specify building insulation for thermal protection in accordance with Title 24 and applicable energy Code requirements.
.02 Specify acoustical insulation between classrooms full-height of the wall.
.03 Between offices, if the wall does not extend full height, extend acoustical insulation horizontally to 48" from the wall.
.04 Other insulation requirements per the District or as required by applicable Code.

END OF DIVISION 7

DIVISION 8 – DOORS AND WINDOWS

8.01 GENERAL

Main entrance doors of buildings shall have automatic door operators or automatic sliding doors to meet Code requirement. The preference is the automatic sliding doors to avoid installing safety rails associated with the swinging doors. Coordinate the automatic doors with adjacent system. If in curtain wall system, verify compatibility and thickness of member with the curtain wall system so that the system looks integral with the curtain wall system. Verify with District in each case.

8.02 DOORS AND FRAMES

.01 Frames - Use welded steel frames only, minimum 16-gauge interior (14-gauge if wider than 48") and 14-gauge exterior (12-gauge if wider than 48"). Finish with Urethane Coating System.

.02 Hollow Metal Doors – Use minimum 18-gauge interior and 16-gauge exterior. Provide hardware reinforcements as required. Use hollow metal doors at exterior locations only. Finish with Urethane Coating System. View panels are not encouraged at all classroom locations, but may be specified at the request of the District.

.03 Interior Wood Doors - Use Type I density, Class 1, Commercial Density CS 236 conforming to ANSI A208.1, Grade 1-LD-2 particleboard-core wood doors for interior uses – 5 ply doors. Do not use 7 or 9 ply doors. Provide MDO plywood face panels ready to receive paint – the surface must be weatherproof and carry a Class B fire rating. Specify painted finish. Wood veneer or laminated doors are acceptable. Verify with the District and the user for requirements.

a. Top and Bottom Rails shall be minimum of 6".
b. Intermediate rails shall be minimum of 6".
c. Provide 6" wide by 18" high solid blocking at lock locations.
d. Provide solid blockings as required at other hardware locations.
e. Provide viewing panel when requested.

.04 At buildings with period architecture match the existing doors, or where replacement with aluminum doors is necessary provide 70 percent dark fluoropolymer paint finish (Kynar or Hylar) the aluminum to emulate the design. If hollow metal doors are specified, also specify Urethane Coating. See Division 9.

.05 Other doors and door finishes will be considered for design purposes only. The college and the District shall determine the appropriateness.

8.03 ACCESS PANELS

.01 Provide key locks on all access panels. Use stainless steel in tile walls - #4 finish. Provide gypsum board overlaid access panels in other walls, and finish to match adjacent surfaces.

.02 All access panels shall be sized and provided for all junction boxes, valves, telephone and data equipment, fire alarm and other devices above non-accessible ceilings and in walls.

.03 Align all access panels with the devices, which they are to provide access to.

.04 If the equipment needing access requires a person to enter the ceiling plenum space, the minimum size shall be 24" x 24".

8.04 ALUMINUM FRAMING AND ENTRANCES

.01 Use for building entrances where designed. Use only 70 percent fluoropolymer paint finish. Use only medium stile doors. (Narrow stile is not acceptable). See Division 5 for Organic Coating System for Metals.

.02 Automatic door openers shall be provided at main entrance doors. The automatic doors shall be sliding type with emergency push panel access, including the non-operable partition.

8.05 FINISH HARDWARE

District Standard. Use only the following types of door hardware in order to control the expenditures for repair parts stock, consistency of hardware lever and handle designs, availability of repair and replacement parts, and for staff training.

.01 Hinges
- a. Provide continuous hinges (full-mortise hinge) at all exterior doors - FM-HD by Pemko or equal.
- b. Provide continuous hinges at all interior heavy use doors, such as classrooms – FM-HD by Pemko or equal.
- c. Office door hinges should be AB700 4.5 x 4.0 by Hager or equal.

.02 Panic Devices
- a. Provide Von Duprin exit devices only.
- b. Provide concealed rods at main entry doors and wherever possible.
- c. Do not install thumb turn. Specify 388NL – no pull.
- d. Specify 626 as the finish.

.03 Pivots (at entry doors only)
- a. Top Pivot shall be 7237F-Top by H. B. Ives – finish = 630
- b. Intermediate Pivot shall be 7237F-Int by H. B. Ives – finish = 630

.04 Mortise Cylinders/Rim Cylinders
- a. All cylinders shall comply with the District Standard Schlage Primus System, GMKD, interchangeable (removable) cores accepting master-ring cylinder.
- b. Specify that all locks and cylinders shall be keyed at the factory of the lock manufacturer where the permanent records are kept.
- c. District will approve the keying system and key schedule in writing.
- d. Schedule for grandmaster keying, master keying, pass key and change key groups shall be developed with the District. The keys shall be properly identified and shall be factory cut and be stamped "**DO NOT DUPLICATE**".
- e. Contact the District regarding the quantities of key required.
- f. Lockset shall be heavy-duty mortise-type (Grade 1) mortise with leer handle equal to Schlage 8200 Series LNH or equivalent conforming to requirements for required fire rating, security and accessible requirements. Make provisions for bore locks at all suites.
- g. Locks shall have minimum throw of ¾" and deadlocks shall have minimum throw of 1"
- h. Specify16-gauge curved steel lip strike with 1" deep box wrought.
- i. Nickel silver keys only.
- j. Permanent keys shall be delivered to the authorized representatives of the District and or school only. Contact the District and arrange for delivery of keys.
- k. Provide LNH type levers from Schlage with 630 finish – at all locations.
- l. Finish shall be 626.

.05 Surface Closers
- a. Provide LCN 4111 or 4011 closers or equal with extra duty arm.
- b. In case where the doors are back to back and floor stop is not practical, cush-n-stop (CNS) can be used with the closer.
- c. Finish should be 689.

.06 Floor Closers
- a. Provide Rixson SC-PH-27 NHO L/TOP PIVOT floor closers. No known equal.
- b. Finish shall be 626.

.07 Offset Pulls
- a. At main entry doors, provide 12" offset pulls only – 23Q Type-8 by Hager or equal.
- b. Finish shall be 630.

.08 Floor Stop
- a. At restrooms, provide 7280 or 7281 floor stop by Trimco or equal.
- b. At classrooms, office, storage and utility closets, provide FS436/FS438 floor stops by H. B. Ives or equal.
- c. Finish shall be 626.
- d. DO NOT install wall bumpers.

.09 Threshold
- a. At main entry provide 176 MTRD-END FHSL threshold by Pemko or equal. Finish should be 719.
- b. At secondary entries (hollow metals doors), provide 172 FHSL threshold by Pemko or equal. Finish should be 719.
- c. 168 FSHL ½-saddle threshold by Pemko or equal can be used as required. Finish should be 719.

.10 Provide the following at all exterior utility rooms doors in addition to those listed above.
- a. K-24 armor collar by Keedex Manufacturing or equal – finish = 689
- b. LG12 lock guard by H.B Ives or equal – finish = 630
- c. 2891-PK head seal by Pemko or equal – finish = 628
- d. 303PK jamb seal by Pemko or equal – finish = 719
- e. 18061P door sweep by Pemko or equal – finish = 628

.11 In addition to above listed hardware provide the following as required.
- a. 8400 12" x 2" LDW .050 B4S kick plate by H. B. Ives or equal – finish = 630
- b. SEM 7800 Series magnetic door holder by LCN with 4040 3210 transformer or equal – finish = 689
- c. 29344P door seal by Pemko or equal – black or gray only.
- d. 572 coat hook by H. B. Ives should be provided at all office doors.
- e. 3527 DP Drilled astragal by Pemko or equal – finish = 600

.12 Provide door holder at all entry doors and at all utility room doors.

.13 Other hardware such as flush bolts, rain drip, rain guard etc. should be provided as required.

.14 Should electrified hardware be required, specify the electrified versions of the specified hardware in this section. Tie into the building fire alarm system, security system and other systems as requested by the District. Provide power as required. Verify with the District for exact requirements.

.15 District may request card key access at main entry doors and other building areas requiring strict access requirement. In all such areas, the equipment shall be campus standard equipment fully integrated with the existing system. Do not specify compatible systems – specify the campus standard system.

8.06 GLAZING

.01 Specify high performance glazing at exterior.

.02 Specify glazing systems to compliment the building design and the surrounding buildings. Do not use mirror glass or highly reflective glazing.

.03 Use of operable glazing systems are encouraged for sustainability. Verify that there are inter-locks

with operable glazing system and the mechanical systems.

END OF DIVISION 8

DIVISION 9 – FINISHES

9.01 GENERAL

Specify extra material (attic stock) for maintenance purposes for all finish materials in this Division: Tile, carpet, paint, wall coverings, resilient floor coverings and others materials that might not be listed but in the project scope. Require adhesives and accessories for installation of the maintenance materials. Require labeling and packaging, and delivery to District's on-site storage facility as directed by the District's representative.

9.02 LATH AND PLASTER SYSTEMS

.01 Avoid the use of integral color plaster system.

.02 Smooth acrylic plaster system with paint as the final finish is preferred by the District – they can be patched and painted many times over without sacrificing the wall (maintenance issue).

.03 Preferred exterior sheathing is 5/8" Dens-Glas Gold. Caulk and seal all joints at the exterior sheathing for added protection against water intrusion.

.04 Preferred manufacturer for the accessories is Fry Reglet Corporation.

.05 Metal lath shall weigh minimum of 3.4 pounds per square yard and shall be fabricated from hot-dipped galvanized steel sheets. Self-furring is preferred.

.06 Seal plaster system where it may be exposed to irrigation water – irrigation at planters next to plaster walls are highly discouraged.

9.03 GYPSUM WALLBOARD AND METAL FRAMING

.01 Use impact resistant gypsum board at all high traffic areas.

.02 Water resistant gypsum board can be used in the restrooms and janitor's closets. At all wet locations in restrooms and janitor's closets, the use of tile backer-board is encouraged.

.03 Walls between the classrooms shall be full-height with gypsum board on both sides. No exceptions. Use transfer ducts, if return air plenum is utilized. Mitigate sound transmission at transfer duct locations. Specify acoustical insulation and sealant.

.04 The following are the finish description of gypsum board walls.

a. Level 1 – Not permitted.

b. Level 2

1. Joints and Interior Angles: Embed tape in joint compound. Apply one separate coat of joint compound over joints, angles, fastener heads and accessories.
2. Surface Appearance: Surface shall be free of excess joint compound. Tool marks and ridges will be acceptable.

c. Level 3

1. Joints and Interior Angles: Embed tape in joint compound. Apply two separate coats of joint compound over joints, angles, fastener heads and accessories.
2. Surface Appearance: Joint compound shall be smooth and free of tool marks and ridges.
3. Pretreatment: Apply prior to application of finish coating.

d. Level 4

1. Joints and Interior Angles: Embed tape in joint compound. Apply three separate coats of joint compound over joints, angles, fastener heads and accessories.
2. Surface Appearance: Joint compound shall be smooth and free of tool marks and ridges.
3. Pretreatment: Apply prior to application of finish coating including primer paint.

e. Level 5
   1. Joints and Interior Angles: Embed tape in joint compound. Apply three separate coats of joint compound over joints, angles, fastener heads and accessories. Apply thin skim coat of joint or topping compound over the entire surface and sand smooth.
   2. Surface Appearance: Joint compound shall be smooth and free of tool marks and ridges.
   3. Pretreatment: Apply prior to application of finish coating including primer paint.

.05 The following are the finishes requirement for the gypsum board wall.
   a. Level 1 – Not permitted
   b. Level 2 – Provide at concealed areas and construction not indicated are to be Level 3, 4 or 5.
   c. Level 3 – Provide at service rooms, riser closets, electrical rooms and equipment rooms.
   d. Level 4 – Provide at locations under fabric-backed wall coverings through which substrate variations would not be noticeable.
   e. Level 5 – Provide at all public areas such as lobbies, classrooms, offices, restrooms, stairways and other areas used by the building occupants or areas scheduled to receive painted finish at the time of construction.

.06 Specify and include heavy-duty wall backing for all wall-mounted items, such as cabinets, marker boards, tack boards, handrails, grab bars, etc.

.07 Specify standard metal studs sizes.
   a. Typical metal studs should be 3-5/8", 4" and 6". Larger studs can be used for extraordinary or structural reasons.
   b. For wall furring, use 2 ½" studs to allow for utilities (electrical power, data, etc.)
   c. All other products, such as furring strips, hat channels, etc., use standard sizes.

.08 Specify 20-gauge metal studs as the standard – do not specify anything less. As a standard, the head and sill track, including the "slip-track" shall be the same gauge as the metal studs – it can be thicker.

.09 Provide "Deep Leg" slip track or similar at all head condition of all metal stud framing – no exceptions

9.04 TILE

.01 Use tile at all "wet" locations. 48" wainscot is acceptable but full height is preferred. Avoid using FRP panels.

.02 Provide crack-isolation/waterproofing membranes at all floor tile location. Float all floors prior to installation of thinset tile. Mortar sitting bed is preferred.

.03 Provide necessary transition strips as required (Schluter strips are preferred.

9.05 ACOUSTICAL CEILINGS

.01 District standard ceiling tiles are one of the following manufactured by Armstrong.
   a. Armstrong 2x4 "Dune Second-Look" #2772 w/CAC backing and angled tagular edge with exposed "T"-Bar system (thin-line). With 2x2 ceiling tiles with tagular edge, use Silhouette XL #7601 9/16" Bolt Slot with ¼" reveal.
   b. Armstrong 2x4 "Optima Second Look" #3255 w/CAC backing and angled tagular edge with exposed "T"-Bar system (thin-line) at areas where higher performance is required. With 2x2 ceiling tiles with tagular edge, use Silhouette XL #7601 9/16" Bolt Slot with ¼" reveal.

.02 Use only heavy-duty grid systems.

Note: Even in 2x2 ceiling grid system, provide 2x4 fluorescent light fixtures. 2x2 light fixtures should be avoid for maintenance issues.

9.06 MODULAR METAL CEILING SYSTEM

.01 If modular metal ceiling systems are specified in the building, provide system similar to Armstrong "Metal Works" 24"x24" perforated metal panel ceiling system with the following characteristics.

a. Armstrong "Metal Works" Silver Gray (Organic Coating) – perforation as needed
b. NFPA 255, UL #723 with black acoustical fleece fabric backing
c. Plenum must be 100% accessible through this system.
d. No fasteners shall be visible.
e. The "T"-Bar suspensions system shall be utilized. The "T"-Bar color shall match the perforated panels. Provide heavy-duty grid system only.
f. Class 1 fire rating is required.
g. Recess all other elements within the field of the perforated metal ceiling system.
h. All other elements, such as light fixtures, diffusers and concealed sprinklers head covers shall be the same color as the ceiling system or complimentary.
i. Ceiling Plus and other manufacturers also manufacturer similar system.

9.07 FLOORING

.01 For Vinyl Composition Tile (VCT), Armstrong is the preferred manufacturer.
.02 12x12 is the preferred size.
.03 Specify slip sheet where applicable
.04 Obtain information from the campus regarding the preferred sealers or waxes.
.05 Rubber flooring system is preferred over VCT.
.06 Other flooring such as Lonseal, terrazzo, stone, tile, linoleum or similar but durable/low maintenance products should be specified. Verify final palette with the District.

9.08 RESILIENT BASE AND ACCESSORIES

.01 Specify 2-1/2"/4" coved base – straight base not recommended.
.02 Specify 120' coil lengths – avoid 48" sections.
.03 Preformed corners can be used as needed.

9.09 EPOXY FLOORING

.01 Provide epoxy flooring in the Elevator Machine Room and the Electrical Rooms.
.02 Color shall be gray.
.03 Other areas may be provided with Epoxy Flooring system as needed by function or design.

9.10 CARPET

.01 Specify unitized (modular) carpet tiles over rolls. If rolls are required, 6-foot roll carpets are highly encouraged.
.02 Specify carpet with high recycled content for sustainability is highly encouraged.

9.11 CONCRETE FLOOR SEALER

.01 Provide for hard, acid resisting surfaces in labs, shops, etc. Provide acrylic sealer on all exposed, finished concrete. Do not leave any concrete surfaces untreated even in utility areas such as janitor's closet, fire sprinkler riser room and storage rooms.

9.12 ANTI-GRAFFITI COATING

.01 Verify with the District for provision for clear anti-graffiti coating on all exterior wall surfaces and in stair wells where exposed masonry are present to height of 8 feet from ground or walkway, or to natural stopping point such as reveals or change of plane/material, whichever is higher. Provide on all elevated surfaces accessible to students. For masonry, use system that is compatible with the water repellent system.

9.13 PAINTING

.01 Use paint products from major paint manufacturers only.

.02 Gloss Levels (As defined by Frazee Paint)

a. Flat: Less than 7 percent
b. Eggshell: In the range of 8 to 15 percent
c. Low Sheen: In the range of 20 to 30 percent
d. Semi-Gloss: In the range of 55 to 70 percent
e. Gloss: Greater than 80 percent.

.03 District prefers Low-Sheen paints for all areas. Other gloss levels should be reviewed with the District – they can be used to illustrate design features. Use of flat finish is highly discouraged.

9.14 URETHANE COATING SYSTEMS FOR METALS

.01 Finish should be semi-gloss.

.02 Gloss can be use to illustrate design features.

The design and the building program may dictate the use of other finish materials. Verify each material with the District for appropriateness and durability.

END OF DIVISION 9

DIVISION 10 – SPECIALTIES

10.01 VISUAL DISPLAY BOARDS

.01 Dry Marker Boards
- a. Facing Sheet shall be P3 ceramic steel facing sheet. Surfaces shall support magnets.
- b. Core shall be ½" plywood (particle board is acceptable).
- c. Backing Sheet shall be moisture resistant aluminum sheet.
- d. The standard Dry Marker Board size is 20'-0" in width. In larger classrooms or lecture rooms, provide 24'-0" wide boards. Other classrooms or the program may dictate larger sizes – verify requirements with the District. Do not install marker boards that are less than 16'-0" in width in the classrooms unless specifically requested by the District.
- e. Specify map hangers, hanging clips and flag holders as standards as a part of the dry marker board system.

.02 Tack Boards
- a. District standard is "Soft-Tone" tackable panel manufactured by Lamvin, Inc. with Koroseal Wallcovering #M621-14 Neutral. Cork is acceptable.
- b. Core shall be non-perforated mineral fiberboard.
- c. ½" soft-tone 50 series
- d. Adhesive mounted, pencil radius edges
- e. Wrap panel edges and provide aluminum top and bottom strips

.03 Use of chalkboards is highly discouraged. Verify with District.

10.02 TOILET COMPARTMENTS

.01 Specify ceiling hung toilet partitions.

.02 The toilet partition and urinal screen panels should be a durable material – plastic laminates are not acceptable.

.03 Do not specify Zamac metal hardware – stainless steel hardware only. Hardware must provide emergency access. Provide gravity hinges.

.04 Urinal screens shall be wall hung.

10.03 STATIONARY WALL LOUVERS

.01 Louvers used as design feature and do not have airflow requirements shall be the site-proof type.

.02 Those louvers required for airflow shall be determined by the Mechanical Engineer – site-proof type is strongly encouraged.

.03 Louvers shall be from a major manufacturer such as The Airolite Company, Industrial Louvers, C/S Group or Ruskin Manufacturing Company. Paint as required.

10.04 CORNER GUARDS

.01 Provide corner guards at high equipment traffic areas where gypsum board is used.

.02 The corner guards should be either anodized aluminum or stain stainless steel. Do not use plastic corner guards.

.03 The corner guard should be designed as an integral part of the wall. Avoid surface application.

10.05 SIGNAGE – EXTERIOR AND INTERIOR

.01 Interior Signage: APCO IM System with the following requirements.
- a. Injection Molded Panel Holder (Color #A78)
- b. Photo-etched Plastic (APCO –IM insert) (Background Color A54; Letter Color A01)
- c. Non-Glare Acrylic Lens at changeable signs such as office with printed paper inserts
- d. Required Tactile Graphics meeting the requirements of CBC.
- e. Silicon adhesive/VHB Mounting Tape
- f. Tamper-proof stainless steel mounting screws
- g. Provide acrylic backing when mounted to site-lites or glazing

For the IM system mounted at exterior specify metal inserts (APCO IM #ME2). The outlined signage above shall cover all Code required signage including Accessibility Signs, Restroom signs, Stairs, utility rooms, etc.

.02 Interior Signage: Metal – Pin Mounted
- a. Either ¼" or ½" thick cast aluminum or stainless steel letters as required.

.03 Message Holder Sign shall be APCO – Full View System with anodized aluminum frames and clear non-glare acrylic panel. Mount using silicone adhesive and VHB mounting tapes and tamper-proof stainless screws.

.04 Building Directory shall be APCO Visulex System with molded fiberglass holders and injection molded plastic strips. Colors shall match interior signage colors.

.05 Building ID signs shall be anodized aluminum or stainless steel pin-mounted letters. Locate signs where it can be seen readily from main campus pedestrian walkways and parking lots. Adhere to campus standard signage requirements

10.06 LOCKERS

Provide only when and where directed by the District. Use painted metal lockers on concrete bases at all new construction. For existing construction, provide metal feet and bases. All lockers shall comply with FDAy requirements for use in food service areas. Use sloping tops, except where lockers are recessed in the walls.

10.07 FIRE EXTINGUISHERS AND CABINETS

.01 Provide semi-recessed or fully recessed type only. Surface mounted cabinets should be avoided.

.02 At utility closets, fire extinguishers can be hung directly on to the walls without cabinets.

.03 Provide appropriate fire extinguishers required by Code.

10.08 TOILET ACCESSORIES

.01 Bobrick is the preferred accessories manufacturer. Following is the list of District Standard Equipment.

Paper Towel Dispenser/Disposal	B-39601
Partition Mounted Toilet Seat-Cover & Tissue Dispenser (Women)	B-3571
Partition Mounted Toilet Seat-Cover & Tissue Dispenser (Men)	B-3471
Recessed Toilet Seat-Cover & Tissue Dispenser	B-3474
Recessed Napkin/Tampon Vendor	B-3500 25

Grab Bars	B-5837
Coat Hook with Bumper	B-212
Surface-Mounted Door Bumper	B-687
Mirror with Stainless Steel Channel Frame	B-165
Lavatory-Mounted Soap Dispenser	B-8221

Design of the mirror can be modified – design to be reviewed with the District. District requires high capacity toilet paper dispensers. Mount two per toilet stall – both walls.

.02 Provide tempered mirror above the lavatory counter. Do not use polished metal mirrors.

.03 Where only lavatory is provided without countertop, use the oval type tempered mirror – adhere to the wall via mechanical fasteners or adhesive.

10.09 OPERABLE WALLS

.01 Verify with District where operable walls may be required.

.02 Provide Hufcor Series 5000 or equal operable walls with an STC of 53 or greater.

.03 Verify with District whether manual or electrical operation is required for specific uses.

.04 Color and finish material shall be compatible with design palette.

10.10 PLUMBING FIXTURE PIPE INSULATION

As required.

10.11 TELEPHONE SPECIALTIES

Verify the need for telephone system in a given building with the District.

10.12 DRINKING FOUNTAINS

.01 Provide drinking fountains with chillers. Remote chillers are acceptable, but do not put chillers above corridor ceilings. Chillers shall be easily accessible.

10.13 CLOCKS

.01 Provide clocks in all classrooms. Clocks shall be synchronous and self-correcting type. Verify with the District for exact requirments.

10.14 KNOX BOX

.01 Provide Knox boxes as required – Knox Box shall be recessed type located in coordination with the District.

Other specialty equipment beyond those that are listed in this section maybe required. Verify the need and the requirement with the District.

END OF DIVISION 10

DIVISION 11 – EQUIPMENT

11.01 PROJECTION SCREENS\PROJECTOR LIFTS

.01 Provide motorized projection screen and projector support bracket at all conference rooms and classrooms. For all other rooms, verify with the District.
.02 Some rooms may need more than one projection screen and projector support bracket. Verify with the District.
.03 Minimum projector screen size shall be determined by the District. Verify actual size with the District.
.04 Projection screen shall be recessed mounted in the ceiling space with exposed components matching the color of the ceiling. Provide flush bottom closure.
.05 Projection screen shall have three-position control switch (UP-STOP-DOWN).
.06 Verify projector support bracket with the District

11.02 RESIDENTIAL APPLIANCES

.01 Avoid specifying any appliances. Verify appliance needs with the District.

11.03 BOOK THEFT PROTECTION SYSTEM

.01 Specify the District standard system. Coordinate exact requirements with the District and the building program.

11.04 LIBRARY SHELVING SYSTEM

.01 If in existing facility, match existing.
.02 If new facility, verify exact type and requirements with the District.

11.05 LABORATORY FURNITURE AND EQUIPMENT AND FUME HOODS

.01 Use casework material (wood, metal, or laminated plastic) as directed by the District. Specify WIC laboratory grade or proprietary construction as directed.
.02 Use only countertop materials that are "through-color" type, such as Corian or molded epoxy resin. No laminated plastic. All countertops should be by one manufacturer.
.03 Verify the final requirements in each lab spaces with the District/Lab consultant.

END OF DIVISION 11

DIVISION 12 – FURNISHINGS

12.01 WINDOW SHADES

.01 Perferred window shading system is manufactured by MechoShade Systems.

.02 The following are the type of shading system used.

a. Manual operating, chain drive, sunscreen roller shades at exterior windows – offices and conferences rooms only

b. Motorized interior solar roller shades at exterior windows – classrooms, labs and other highly public spaces.

c. Motorized interior room darkening roller shades with blackout fabric at exterior windows.

.03 If motorized solar roller shades or room darkening shades are used over multiple windows, the shading system shall be provided with synchronous motors. Motors shall be concealed inside the roller. In public areas, the rollers can be on timer for automatic operation.

12.02 ENTRANCE MATS

.01 Provide entrance mats similar to KD-98 clean tread stainless steel entrance grating by Kadee Industries. Alum. Mats are acceptable.

.02 Other walk-off mats such as Interface "Super-Flor" or similar are acceptable with stainless steel edge trim/transition.

END OF DIVISION 12

DIVISION 13 – SPECIAL CONSTRUCTION

13.01 FIRE PROTECTION SYSTEM

Fire sprinkler heads shall be concealed type at all public areas with color selected by the Architect.

13.02 FIRE PROTECTION PIPING

.01 Underground on-site piping up to 5 ft. from building shall be either Polyvinyl-Chloride, SDR-14 AWWA-900, Class 200 pipe or Class 200 ductile iron pipe with mechanical fittings. Protect iron pipe and fitting from corrosive soil – verify with Geotechnical Report.

.02 Underground piping from 5 ft. outside of building to 6" above floor slab: Ductile iron pressure pipe, AWWA C-151 with AWWA-111 Mechanical Joints. Protect iron pipes and fitting from corrosive soil – verify with Geotechnical Report.

.03 Above Ground Piping

a. 1" through 2" schedule 40 black steel threaded pipe U.L. and F.M. approved.
b. 2 ½" and larger, schedule 10 black steel, roll-grooved pipe, UL/FM approved steel pipe A-795, roll-grooved and joined with UL listed rubber gasketed coupling.

.04 Provide check valve between the Post Indicator Valve (PIV) and the Fire Department Connection (FDC).

.05 Provide standpipe drain at the fire sprinkler riser.

.06 Gate valves are required at all fire hydrants.

END OF DIVISION 13

DIVISION 14 – CONVEYING SYSTEMS

14.01 HYDRAULIC ELEVATORS

.01 Don't use holeless elevators. Elevators shall have push button controls, for unrestricted use.
.02 Use Smoke Containment Systems or other appropriate systems for 3-story buildings or higher.
.03 Elevator doors and frames shall be #4 stainless steel.
.04 Elevator cab wall panels can be plastic laminate with stainless steel trim and handrails. But more durable surfaces may be preferred.
.05 Elevator cab ceiling shall be #8 stainless steel with six panels with one light per panel. Designate the removable panel.
.06 The call button plate shall be #4 stainless steel with engraved letter. Incorporate fireman's jack or key and maintenance key within the same plate. Maintenance key on the jamb is acceptable.
.07 At two-story building eliminate the hall lantern. Install the cab-riding lantern instead.
.08 Elevator shall be installed per all Code requirements.
.09 Specify shunt-trip breakers in the Electrical Section for the elevators. Emergency power to the elevator in case emergency to bring the elevator to ground floor is required.
.10 Use of proprietary controllers or parts are prohibited. Include language in the Project Manual regarding proprietary parts.

END OF DIVISION 14

DIVISION 15 – MECHANICAL

15.01 PLUMBING PIPING AND VALVES

.01 Soil, waste and vent under floor slab and underground to 5ft. from building: Service weight cast iron NO-HUB joint pipe with stainless steel couplings and neoprene gaskets.

.02 Soil, waste and storm drain piping underground up to 5ft. from building: PVC gravity sewer pipe and fittings, SDR-35, bell and spigot compression ring-tite joint, ASTM D3034, Johns Manville, TRX-11.

.03 Soil, waste and vent inside building above ground 2" and smaller.

a. Coated service weight cast iron pipe with cast iron soil fittings, FED Spec, WW-P-401, or NO-HUB joint No. CISPI-301, with stainless steel couplings.

b. Galvanized schedule 40 steel, ASTM A-53 with cast iron screwed fittings.

c. Copper DWV

.04 Soil, waste and vent inside building above ground 3" and larger.

a. Coated service weight cast iron pipe with NO-HUB joint No. CISPI-301 with stainless steel couplings with neoprene dual-seal gaskets.

b. Copper DWV

.05 Storm drainage piping in concealed spaces: NO-HUB cast iron with stainless steel couplings.

.06 Storm drainage piping in exposed areas.

a. Schedule 40 galvanized steel pipe ASTM A-53 with cast iron long sweep fittings.

b. Copper DWV

.07 Natural gas piping underground, up to building shut-off valve: Polyethylene pipe, ASTM D-2513 poly pipe 3810 with PE-2406 fittings with #12 electric tracer copper wire, spiral wrapped around pipe.

.08 Polyethylene-to-steel transitions: Transition riser schedule 40 steel epoxy coated casing with double "O" ring seal transition fitting.

.09 Natural gas inside of building 2" and smaller: Schedule 40 black steel pipe ASTM A-53 with malleable iron screwed fittings.

.10 Natural gas inside of building 2-1/2" and larger: Schedule 40 black steel pipe, ASTM A-53 with butt-welded fittings.

.11 Domestic water piping underground outside of building 1/2" through 2 1/2".

a. PVC Type 1, Grade 1, schedule 40 pressure pipe with PVC Type 1, Grade 1 Schedule 80 ASTM D-2464 threaded fittings or D-2467 socked cement welded fittings.

b. Copper Type "K" with Harris Stay-Silv 15 silver bracing alloy plus 4 mil wrap.

.12 Domestic water piping underground outside of building 3" and larger: PVC pressure water pipe, Johns Manville "Blue-Brut" Class 200 (DR-14) AWWA C-900, ring-tite, with pressure rated PVC fittings.

.13 Domestic water piping under floor slab 3" and smaller: Type "K" hard draw copper tubing ASTM B-88. Brazed joints with silver solder.

.14 Domestic hot and cold water above ground: Type "L" hard draw copper tubing ASTM B-88 with wrought copper fittings. Joints made up with lead-free solder, can field 100% water safe.

.15 Domestic water piping in pipe tunnel: Type "K" hard drawn copper tubing ASTM B-88 with wrought copper fittings and victaulic joints.

.16 Condensate waste piping: Type "M" copper hard drawn copper tubing, ASTM B-88 with copper fittings made up with can field 100% water safe and flux, provide cleanout plugs. Insulate at concealed areas.

.17 Sterilizing of water piping: Add chlorine in solution in accordance with AWWA C651 or AWWA C652.

.18 Water Valves: Ball valves manufactured by Apollo or Watts
   a. Full port bronze with TFE seats, 600 psi SWP, S.S. ball, threaded 600 psi WOG.
   b. 2 1/2 inch and larger underground, flanged S.S. ball valve with S.S. trim and non asbestos gaskets.

.19 Cleanouts: For cast-iron soil pipe, iron body with extra heavy bronze plugs; and for vitrified clay pipe, vitrified clay plugs. Where cleanouts occur in finished interior walls, provide access panels, plates and frames for flush mounting. Exposed parts of floor cleanouts shall have adjustable top. All cleanouts and cleanout plugs shall be accessible.

.20 Pipe Hangers: Hold horizontal pipe runs firmly in place using approved steel and iron hangers, supports, and/or pipe rests unless otherwise indicated. Suspend hanger rods from concrete inserts or from approved brackets, clamps or clips. Hang pipes individually or in groups if supporting structure is adequate to support weight of piping and fluid. Except for buried piping, hang or support pipe runs so that they may expand or contract freely without strain to pipe or equipment. Provide lateral bracings where hangers exceed 12" long.

.21 Angle Stop and Supply: Heavy pattern chrome plated brass stop with full turn brass stem, loose key chrome plated copper solid riser. Equivalent to McGuire H Series.

15.02 PLUMBING FIXTURES AND EQUIPMENT

.01 Water Closet: Wall hung, elongated bowl, white vitreous china - equivalent to Kohler K-4325 "Kingston".

.02 Flush valve for water closets: 1.28 gallons per flush, hardwired automatic flush valve equivalent to Sloan Crown Optima Model #111-1.28 ES-S.

.03 At each toilet with a floor drain, provide one flush valve with vacuum breaker trap primer and piping to floor drain trap.

.04 Toilet seat: Solid plastic, white, open front seat less cover.

.05 Urinal: Wall hung with hard-wired automatic flush valve 0.125 gallon (1 pint per flush) - white vitreous china equivalent to Zurn Z5798.

.06 Lavatory
   a. Counter mount, ADA: Vitreous china, 20 by 17 inches, 3 holes, 4 inch centers. Equivalent to Kohler K-2196-4 "Pennington".
   b. Undercounter mount, ADA: Vitreous china, 19 by 17 inches. Equivalent to Kohler K-2210 "Caxton".
   c. Wall hung, ADA: Vitreous china, 20 by 18 inches, concealed arms, 3 holes, 4 inch centers. Equivalent to Kohler K-2005 "Kingston".
   d. Lavatory Faucet: Equivalent to Sloan Optima Plus EBF-85-4-BDT hard-wired, sensor operated, 0.5 gpm vandal resistant spray head, trim plate, below deck thermostatic mixing valve. Grid drain.

.07 Drinking fountain: Standing and wheelchair level dual purpose stainless steel, #4 satin finish. Equivalent to Haws H-1011MS, chiller optional.

.08 Hydration staton: Recessed bottle fill station with integral filter – equivalent to Elkay LZWSMDK.

.09 Shower:
   a. Gang Shower: Concealed metering shower valve with integral stops. Institutional shower head with adjustable head. Vandal resistant mounting fasteners. Equivalent to Symmons 3-320.
   b. ADA Shower: Same as gang shower except with level diverter valve, two fixed shower heads, one mounted at ADA compliant height.
   c. Thermostatic Mixing Valve and Cabinet: Stainless steel cabinet with hinged door and lock. Thermostatic controller with swivel action check stops, removable cartridge with strainer, volume control shut-off valve, thermometer. Equivalent to Symmons

Tempcontrol.

.10 Service sink:

a. Floor mounted, cast-iron acid-resisting enameled 28 by 28 inches with coated wire rim guard and 3 inch strainer. Equivalent to Kohler K-6710 "Whitby".

b. Faucet: Chrome-plated wall mounted fitting with hose end, vacuum breaker, wall brace, bucket hook, integral stops. Equivalent to Kohler K-8908.

.11 Sink:

a. Single compartment, 18 gauge stainless steel, 19 by 21 by 6-1/2 inches deep, three holes, 8 inch spread, self-rimming, undercoated, rear drain. Equivalent to Just SL-ADA-1921-A-GR.

b. Faucet: Single lever handle, 8 inch spread, swing spout, chrome plated solid brass body. Equivalent to Delta 140.

c. Garbage Disposer: Continuous feed, 3/4 hp motor, stainless steel grinding elements. Equivalent to In-Sink-Erator Pro 333.

.12 Water heater, gas: Equivalent to Raypak Hi Delta low NOx water heater with integral pump and storage tank. Tankless water heaters are also acceptable.

.13 Water heater, electric: Instantaneous, tank-less point-of-use, internal high limit device, UL listed. Equivalent to Hot Aqua 70/277 SI. Shall be installed only where fixture requiring hot water is greater than 100 ft. from the hot water loop.

.14 Hot water circulating pump: All bronze construction, close-coupled, centrifugal type, complete with mechanical seals, wearing rings. Provide with 7-day time clock and interlock with pump. Shall be installed only where fixture requiring hot water is greater than 50 ft. from water heater. Outdoor installations shall have sheet metal rainguard.

.15 Emergency Shower and Eyewash: 1-1/4 in. galvanized pipe, shower head ABS plastic with instant action ball valve and rigid pull-rod, ABS plastic bowl, eye/face wash fountain complete with emergency sign, ADA. Equivalent to Haws 8200 WC.

.16 Floor Drain, Foot traffic: Cast-iron double drainage drain with clamping flange, bottom outlet and 5 in. square polished nickel bronze adjustable strainer. 3 in. size drains shall have 6 in. square strainer. Equivalent to Smith 2005-B. Provide floor drains at all restroom locations.

.17 Floor Drain, Medium duty: Cast-iron, flashing collar, 8 in. round cast-iron bar grate, reinforced square strainer. Equivalent to Smith 2005-B with Smith Suffix K.

.18 Roof Drain:

a. Cast-iron drain, adjustable extension sleeve, flashing collar, gravel stop cast-iron dome strainer, sump receiver and underdeck clamp. Equivalent to Smith 1010.

b. Small roof areas: Cast-iron drain, adjustable with extension sleeve, flashing collar, gravel stop, cast-iron dome strainer, sump receiver and underdeck clamp. Equivalent to Smith 1330Y.

.19 Overflow Drain:

a. Cast-iron drain, extension sleeve, flashing collar, 2 in. high water dam, cast-iron dome strainer, sump receiver and underdeck clamp. Equivalent to Smith 1070-Y.

b. Small roof areas: Same as small roof area roof drain, except with 2 in. high standpipe water dam.

.20 Floor Sink:

a. 12 in. square, 6 in. deep acid-resistant coated interior cast-iron drain and grate, cast-iron bottom dome strainer and underdeck clamp. Provide partial grate for discharge pipes. Equivalent to Smith 3140-Y.

b. Acid-resisting enameled cast-iron drain and grate, cast-iron dome strainer and underdeck clamp. Provide part grate for discharge pipes. Equivalent to Smith 3100Y.

.21 Roof Receptor: 12 in. diameter cast-iron drain, 2 in. high solid water dam, cast-iron bottom dome strainer, sump receiver and underdeck clamp. Equivalent to Smith 3980-Y.

.22 Roof Receptor: 8 in. diameter cast-iron drain, 2 in. high solid water dam, cast-iron bottom dome strainer, sump receiver and underdeck clamp. Equivalent to Smith 3960-Y.

.23 Provide standpipe drain with trap primer for fire sprinkler riser test drain.

15.03 HYDRONIC PIPING, VALVES AND SPECIALTIES

.01 Chilled Water Piping, Above Ground

a. Steel pipe 2-1/2" and larger, ASTM A120 Schedule 40 black steel, seamless pipe with 150 Psi butt welded fittings and welded neck flanges.

b. Copper tubing 2" and smaller, Type L hard drawn copper tubing ASTM B88 with wrought copper fittings made with 95-5 solder flux, or silver braze.

.02 Chilled Water Piping, Below Ground

a. Direct buried factory prefabricated piping system for chilled water. All pipe shall be supplied by the same manufacturer.

b. Manufacturers:

1. Perma-Pipe/Ric-Will
2. Thermal Pipe Systems
3. Rovanco

c. Carrier Pipe Steel, ASTM A120 Schedule 40 black steel, seamless pipe with 150 PSI butt welded fittings and welding neck flanges.

d. Spray-applied polyurethane foam insulation.

e. Polyester resin/fiberglass reinforcement composite jacket.

.03 Condenser Water Piping, Above Ground

a. Steel Pipe (all sizes), ASTM A120 Schedule 80, black steel, seamless pipe with 150 psi butt welded fittings and welding neck flanges.

.04 Heating Hot Water Piping, Above Ground

a. Steel Pipe 2-1/2" and Larger, ASTM A120 Schedule 40 black steel, seamless pipe with 150 psi butt welding fittings and welding neck flanges.

b. Copper Tubing 2" and Smaller, Type "L" hard drawn copper tubing ASTM B88 with wrought copper fittings made up with 95-5 solder and flux, or silver braze.

c. Piping shall be tested for 150 PSIG for minimum 4-hour duration.

.05 Heating Water Piping, Below Ground

a. Direct buried factory prefabricated piping system for hot water. All pipe shall be supplied by the same manufacturer.

b. Manufacturers:

1. Perma-Pipe/Ric-Will
2. Thermal Pipe Systems
3. Rovanco

c. Carrier Pipe Steel, ASTM A120 Schedule 40 black steel, seamless pipe with 150 PSI butt welded fittings and welding neck flanges.

d. Spray-applied polyurethane foam insulation.

e. Polyester resin/fiberglass reinforcement composite jacket.

.06 Equipment Drains and Overflows

a. Copper Tubing 2" and Smaller, Type "L" hard drawn copper tubing ASTM B88 with wrought copper fittings made up with 95-5 solder and flux.

.07 Valves – Review specification for labels and numbering and charts – access panels.

a. Check Valves: Installed in Discharge Piping from pumps shall be wafer type non-slam check valves.

b. Strainers: Locate upstream from each control valve, pump, coil, water make-up and steam trap, cast iron body with stainless steel basket, flanged connections with gasketed

cap.

c. Water Shut-Off Valves: All shut off-valves shall be full ported ball valves with stainless steel ball and threaded ends. Butterfly valves, where indicated on the drawings, shall be lug type with extended neck, lever handle for size 3", and handwheel gear drive for 4" and larger size valves.

d. Plug Cocks: Up to 2" size with bronze body bronze tapered plug, Teflon packing, threaded ends. For 2-1/2" and larger with cast iron body and plug, pressure lubricated, Teflon packing, flanged ends.

e. Steam Shut-Off Valves: All stainless steel, full ported ball valves suitable for minimum 100 steam operating pressure.

.08 Expansion Tanks

a. Manufacturers

1. Ace
2. Bell & Gossett
3. Wessels
4. Mepco

b. Construction: Closed, welded steel, stamped in accordance with ASME Code for 125 psi rating, galvanized inside and outside, supplied with support saddles and with tappings for installation of accessories.

c. Gauge glass set shall be refrigerant type with compression stops.

.09 Air Separators

a. Manufacturers

1. Bell & Gossett
2. TACO
3. Spirotherm

b. Combination air separators/strainers, welded steel air eliminator and dirt separator, stamped in accordance with ASME Code for 125 psi rating, with galvanized steel integral strainer with 3/16" perforations, tangential inlet and outlet connections, internal stainless steel air collector tube, and airtrol tank fitting for installation on expansion tank.

15.04 HVAC PUMPS

.01 End Suction Pumps

a. Manufacturers

1. Armstrong
2. Bell & Gossett
3. PACO
4. Peerless

b. Centrifugal pumps shall be flex coupled, with bronze impeller, stainless steel shaft, solid volute with direct support to base, mechanical seal, and premium efficiency, non-overloading motor to operate a maximum speed of 1750 rpm.

c. Furnish safety guards over flexible couplings.

d. Pump and motor alignment shall be checked by the manufacturer's representative after installation.

e. Outdoor application pumps shall have TEFC motor.

15.05 CHEMICAL WATER TREATMENT

.01 System Cleaner: Condenser water, chilled water and hot water piping systems. Clean systems with highly alkaline chelating agents to remove all oil and mill scale. Drain and flush systems and feed with clear water.

.02 Chemical Feeders

a. Hot and Chilled Water Systems: Pot-type feeder for 125 psi working pressure, complete with flow indicator, drain, service shut-off valves and needle valve - minimum capacity of 5-gallons.

b. Condenser Water System Treatment Equipment shall include:

1. Solution metering pumps (One for inhibitor and two for biolides)
2. 50 gallon double wall polyethylene solution tanks (Minimum 3)
3. Liquid level switch
4. Packaged conductivity monitor and controller, digital control.
5. Water meter
6. Solenoid valves
7. Timers
8. Service valves
9. CPVC Schedule 80 piping.
10. Weatherproof double wall enclosure to house controller and pumps.

.03 Water Treatment

a. Chemicals for hot and chilled water closed systems and for condenser water system will be furnished by the College Facility Department and shall be added into each system by the contractor under District personnel supervision.

b. The District personnel shall be notified 96 hours prior to water treatment, and the contractor shall fill all chemicals and shall provide 4 month water treatment supervision and testing.

c. Include installation of water treatment system components in piping system.

15.06 FINNED WATER TUBE HYDRONIC HEATING BOILER

.01 Manufacturers:

a. Parker Boilers
b. Ajax
c. Cleaver Brooks
d. Lockinvar

.02 High efficiency, steel water tube, natural gas fired with low nox burner. The unit shall meet the latest Air Quality Management District (AQMD) regulations.

.03 Furnished complete with integrated outdoor temperature reset controller, barometric damper and fully modulating burner. Provide control trims to allow interface with campus energy management system.

.04 Manufacturers representative startup required. Submit startup report to campus.

15.07 AIR HANDLING UNITS AND CENTRIFUGAL FANS – Controlled by District EMS, no exceptions. Major manufacturer approved by District in advance.

.01 Air Handling Units

a. Manufacturers

1. Energy Labs Inc.
2. Governair
3. Huntair

4. Haakon
5. McQuay

b. Type
1. Variable air volume, 0" to 5" static pressure Class II supply fans and return fans.
2. Units shall include the following:
a. Double skin, 16 gauge galvanized steel, insulated casing with welded frame construction with 14 gauge galvanized steel walk-on floors.
b. Stainless steel condensate drain pan.
c. Copper tube and aluminum fin cooling coils and heating coils.
d. Double skin construction, hinged and latched access door to each unit section.
e. Air filter section for 40% efficient air filters.
f. Mixed air plenum with extra low leakage dampers.
g. Premium efficiency fan motors, inverter duty.
h. Internal isolations with seismic restraint.
3. Variable frequency drive for fans.
a. Manufacturers:
1. Reliance "VTAC-9"
2. Cutler-Hammer
3. Yaskawa
4. ABB
b. VFD shall be mounted in a ventilated compartment as a part of the air handling units. For the VFD installed external of air handling unit, provide approved outdoor NEMA enclosure with integrated ventilation system.

c. Centrifugal Fans
1. Manufacturers:
a. Greenheck
b. Cook
c. Twin City Fan
2. Type:
a. All welded, centrifugal, air foil fans.
b. Class I for 0" to 2" static pressure.
c. Class II for 2 1/2" to 5" static pressure.

15.08 CHILLERS AND COOLING TOWERS

.01 Chillers – Water-Cooled and Air-Cooled
a. Verify with each campus for the standard equipment – acceptable manufacturers are Carrier, Trane, York, McQuay and SMARDT.
b. Factory start up is required.

.02 Cooling towers
a. Manufacturers:
1. Baltimore Air Coil
2. Marley
3. Evapco
b. Type: All stainless steel construction with vertical discharge, induced draft type, with sump, fan, surface sections, draft eliminations, sloped ladder with structural platform for servicing and premium efficiency TEFC motor.
c. Provide inverter duty fan motor on unit fitted with variable frequency drives.

d. Factory start up is required.

15.09 PACKAGED ROOFTOP AIR CONDITIONING UNITS

.01 Replacement air conditioning units
- a. Manufacturers:
  1. Trane
  2. Carrier
  3. Aaon
  4. York
  5. McQuay
- b. Type:
  1. To match existing performance, features, and unit configuration.
  2. Must adapt for connection to existing supply and return air ductwork.
  3. Provide roof curb with seismic restraint and vibration isolations.
  4. Provide economizer with variable speed relief fan.
  5. Provide controls to allow interface to campus energy management system.

.02 Packaged rooftop air conditioning units
- a. Manufacturers:
  1. Carrier
  2. Trane
  3. York
  4. McQuay
  5. Aaon
- b. Type:
  1. Gas heat and electric cool
  2. Heat pump
  3. Commercial duty, high efficiency.
  4. Provide roof curb with seismic restraint and vibration isolations.
  5. Provide economizer with variable speed relief fan.
  6. Provide controls to allow interface to campus energy management system.

15.10 EXHAUST FANS

.01 Manufacturers:
- a. Cook
- b. Greenheck
- c. Penn
- d. Twin-City Fan

.02 Roof exhausters: Centrifugal fan unit belt driven, with spun aluminum housing, resilient mounted motor, disconnect switch, roof curb and aluminum bird screen.

.03 Utility Fan: Centrifugal fan with single width single inlet, belt driven, steel construction with airfoil blade steel wheel. Premium efficiency motor.

15.11 DUCTWORK AND AIR DISTRIBUTION

.01 Ductwork and plenums
- a. Fabricate and support ductwork and plenums in accordance with SMACNA Duct Construction Standards, California Mechanical Code, and ASHRAE handbooks.
- b. Steel ducts: ASTM 525 galvanized steel sheet, lock forming quality, having zinc coating

in conformance with ASTM A90.

c. Insulated flexible ducts: Wrapped with flexible glass fiber insulation, enclosed by seamless aluminum pigmented plastic vapor barrier jacket.
   1. Low pressure ducts rated for 2" W.G. positive and 1 1/2" W.G. negative pressure.
   2. Medium pressure duct rated for 5" W.G. positive or negative pressure.

d. Fibrous glass ducts: Not acceptable.

e. Exposed exterior duct with insulation shall have lined insulation with exterior ceramic paint with optional double wall construction.

.02 Air terminal Units

a. Manufacturers:
   1. Titus
   2. Krueger
   3. Price

b. Type: Duct mounted variable air volume supply air control terminals for connection to single medium pressure duct, with variable air volume controls connected to building automation control system. Hot water heating coils shall be provided for zones that are located at the exterior perimeter of the building.

.03 Diffusers and registers

a. Manufacturers:
   1. Titus
   2. Krueger
   3. Price

.04 Ceiling diffusers: Rectangular or square modular core with adjustable direction pattern type diffuser. Surface mount for gypsum board ceiling and filler panel mount for T-Bar lay-in application. Fabricate of steel with baked enamel finish, provide opposed blade volume damper on diffuser at gypsum board or inaccessible ceiling.

.05 Exhaust and return registers

a. Surface mount: Louver face with 1/2" bar spacing and opposed blade volume damper, fabricate of aluminum or steel baked enamel finish.

b. T-Bar lay-in application: Perforated face, fabricate of steel with baked enamel finish.

c. Ceiling grilles: Same as registers except without opposed blade volume dampers.

15.12 VIBRATION ISOLATIONS AND SEISMIC CONTROLS

.01 Manufacturers:

a. M.W. Sausse

b. Mason Industries

.02 Provide vibration isolations and seismic restraints on all mechanical equipment with motor and/or air-moving devices.

.03 Provide structural steel bases, inertia bases and support brackets as required.

.04 With each vibration isolation and seismic restraint, provide design calculation prepared by a licensed Structural Engineer and applicable details.

15.13 SOUND ATTENUATIONS

.01 Manufacturers:

a. Industrial Acoustics

b. Commercial Acoustics

c. Vibro-Acoustics

.02 Factory Fabrication, tested per ASTM E 477.

.03 Adhesives, sealants, packing materials, and accessory materials shall have fire rating not exceeding 25 for flame-spread index and 50 for smoke-developed index when tested according to ASTM E 84.

15.14 DUCTWORK ACCESSORIES

.01 Manufacturers:
- a. Ruskin
- b. Pottorff
- c. Greenheck

.02 Combination smoke and fire dampers shall be labeled according to UL 555S and approved by California State Fire Marshal.

.03 Volume dampers shall be factory fabricated with required hardware and accessories. Stiffen damper blades for stability; include locking device to hold dampers in a position without vibration. Provide dampers consistent with system pressure classification.

.04 Provide access panel for servicing the dampers.

15.15 COMPUTER ROOM AC UNIT

.01 Manufacturers:
- a. Liebert
- b. Data Aire

.02 Split system air-cooled with outdoor condenser or condensing unit.

.03 Provide reheat, humidity control and condensate pump.

.04 Provide auto-changeover controller on multiple units serving a single room.

15.16 BUILDING AUTOMATION CONTROL SYSTEM

.01 The building automation control equipment shall be Bac-Net open protocol system capable of interfacing with existing campus EMS system. No proprietary equipment shall be specified.

.02 The specifications shall include the extension of the existing and intra-connection with the new central building automation control system, and shall include all labor, material, equipment, software, and programming necessary to meet the functional performance of the new and existing building automation systems.

15.17 TESTING, ADJUSTING AND BALANCING

.01 Each air handling system, air distribution outlet, exhaust system, boiler, chiller, cooling tower, coils, pumps, and hydronic system shall be tested, adjusted, and balanced in conformity with the AABC Standards. A minimum of 6-copies of the test and balance reports shall be submitted.

15.18 COMMISSIONING

.01 The District retains the services of independent third party commissioning agent for all construction projects. It should be clearly indicated that these agents will be involved in the commissioning in the Project Manual if not a LEED project.

END OF DIVISION 15

DIVISION 16 – ELECTRICAL

16.01 TESTING

.01 Testing shall include but not be limited to:
- a. Operations test of each piece of equipment or device.
- b. High potential DC test for 5KV and above cables.
- c. Ground fault test of circuit breakers equipped with ground fault protection.
- d. Ground resistance test on each ground rod or ground electrode.
- e. Medium voltage liquid filled transformer electrical test including insulation resistance, turns ratio, dielectric absorption, insulating liquid, as over potential on windings, etc.
- f. Fire alarm system test per NFPA.
- g. Voice and data copper and fiber cable test per Structured Cabling System specifications.

16.02 RACEWAYS AND BOXES

.01 Use rigid steel conduit where exposed and subject to physical damage as for all exterior locations and interior locations less than 10 feet above floor.

.02 Use EMT inside of the building (where concealed in ceiling or wall including exterior wall cavities) – paint all conduits associated with Fire Alarm red.

.03 Use PVC schedule - 40 underground

.04 Minimize use of flex conduits. Use for drops to light fixture, through wall studs, connection to equipment subject to vibration and in locations where rigid conduit cannot be used only. Limit maximum length to 6 feet. Use steel flex.

.05 Minimum size conduit shall be ½" for power, ¾" for communications.

.06 Provide ground wire in all power conduits.

.07 Multi-channel surface raceways:
- a. Use Wiremold, Panduit or 3M to match existing infrastructure. Secure to structure permanently with screws.
- b. Do not specify plastic raceway.
- c. Use concealed conduits wherever possible. Use metal surface raceways in exposed work in finished areas only if use of concealed conduit is not possible. Minimum size of wiremold shall be type 700.

.08 Do not use fixture BX cable including BX whip from a ceiling j-box drop to a light fixture. Use flex conduit.

.09 Use galvanized unistrut supports.

.10 Use weatherproof roof jacks.

.11 Underfloor duct: Walker Duct.

.12 Cable Tray - use ladder type tray, PW or equal by B-Line.

.13 Boxes:
- a. 4" square deep minimum.
- b. Use specification grade steel boxes.
- c. Label panel, voltage and circuit numbers on covers for power and system name for low voltage, e.g. clock, TV, security, etc.
- d. Paint cover and box of fire alarm system red.
- e. Floor boxes: Walker, FSR. Do not use monuments, use flush floor boxes only.
- f. Concrete Pull Boxes: Complete concrete units. Set box on bed of gravel, box shall have bottom sump. Provide cable racks in box to support cable. Provide traffic grade concrete cover. Box cover shall be engraved power or communications.

.14 Use cast malleable metal box by Crouse-hinds or Appleton at building exterior.

16.03 WIRES

.01 Use Copper only and color code per industry standards.
   a. Use THWN/THHN
   b. Provide a ground wire in every power conduit.

16.04 WIRING DEVICES

.01 Use Leviton, Pass and Seymour
.02 Use vandal resistant exterior outlets.
.03 Use stainless steel plates.
.04 Use Industrial Specifications grade devices.
.05 For under 600 volt application, use current limiting fuses by Bussmann, Gould or little fuse. Provide 25% spares and not less than one set of each size.

16.05 DIMMING

.01 Use Lutron wall dimmers – daylight sensor input is required. Do not use separate dimmer packages except in theaters or as required by the District.
.02 Fluorescent dimming shall use 0-10 volt ballast with daylight sensor input.

16.06 LIGHTING CONTROL

.01 Exterior lighting and common area lighting (verify locations with the District) shall be controlled by low voltage relay panel with an integrated time clock and photocell as manufactured by Wattstopper. The interior lighting shall be controlled by occupancy sensor and daylight sensor with manual wall station control.

16.07 MEDIUM VOLTAGE SUBSTATION, PAD MOUNTED TRANSFORMER AND SWITCHES

.01 The backbone system is 12kV power infrastructure. The building shall be fed from an existing 4-way G & W switch to a slab box mounted, liquid filled transformer - size primary and secondary feeders accordingly. Verify exact requirements and operational status of this system with the District.

16.08 SWITCHBOARDS, PANELBOARDS AND DISCONNECT SWITCHES.

.01 Use copper plated bus only.
.02 Each panelboard cover (for access to interior wiring and circuit breaker connections) shall be hinged with a piano hinge for easy access. Note that this is in addition to standard hinged panel door.
.03 Provide equipment from major manufacturer such as Square-D, Culter-Hammer, etc.
.04 Use laminated white on black engraved nameplates. Nameplate data shall include voltage and source.
.05 208/120 volt panelboards shall have 200 % neutral bus and isolated ground bus.
.06 Use K-13 dry type transformers. Size each transformer using connected load plus 25% spare capacity.
.07 Use panelboard with integral surge suppression for computer labs or as required by District.
.08 Use bolt-on circuit breakers only

.09 Specify shunt-trip breakers for elevators – see Section 14 of these documents.

16.09 LIGHTING

.01 Exterior lighting shall be metal halide or compact fluorescent and shall be vandal resistant. Use high-pressure sodium fixtures for general application but metal halide and compact fluorescent may be used in special applications. Any modifications to the main Pedestrian Walkway at Palomar College shall be replaced in kind to match existing light fixtures.

.02 Specify three switches at all classrooms and labs as follows when dimmers are not provided.
- a. Switch One shall be to lights illuminating the marker board (teaching wall).
- b. Switch Two shall be to 50% of lamps in the classroom.
- c. Switch Three shall be to remaining 50% of the lamps.

.03 Use 4-foot fluorescent lamps, T-8, 3500 degree color temperature. Avoid 4'x4' and 2'x2' fixtures. Avoid fixture housing that uses longer than a 4-foot lens and lamps. T-5 lamps are acceptable.

.04 Use Sylvania, GE or Philip fluorescent lamps.

.05 Use Sylvania, GE or Philip HID lamps. Use clear metal halide lamp, universal mounting position.

.06 Metal halide lamps in open light fixture shall be the safety type suitable for open fixture.

.07 Also refer to Division 2 for more exterior lighting information.

16.10 EMERGENCY SYSTEM

.01 A central inverter shall be used for emergency lighting.

16.11 CLOCK SYSTEM

Refer to Section 10.13.

16.12 EXIT SIGNS

.01 Specify exit sign where required by Code.

.02 Exit sign shall be transparent type with green illuminated letters.

.03 Specify LED exit signs only.

.04 Exit sign shall be connected to emergency power system as required.

16.13 FIRE ALARM SYSTEM

The backbone Fire Alarm Fiber Infrastructure system is Siemens MXL Fire Alarm panels with MMB3 Motherboards supported by single mode fiber network by the way of Network Fiber modules Siemens D2300 series. The main panel/announciator is located in the "RS" Building. All new fiber alarm system shall be fully automatic/addressable.

16.14 ACCESS CONTROL AND ALARM SYSTEM

.01 District Standard currently does not have a standard equipment. Verify with the District. The components may include the following.
- a. Access Control Software Operating System
- b. Control Panels
- c. Power Supplies
- d. Keypads, Card Readers, and Interfaces - FOB

e. Reader Interface
f. Proximity Access Cards

g. Expansion Alarm Input Board: Use when there are additional points or equipment to be monitored by the access control system. Each control panel is equipped with an alarm input for each door port in the panel to monitor the specific doors. Each control panel can hold two additional Expansion Alarm Input Boards.
h. Expansion Relay Output Board: Use when there are additional points or equipment to be controlled by the access control system. Each control panel is equipped with a Relay Output for each door port in the panel to monitor the specific doors. Each control panel can hold two additional Expansion Relay Output Boards.
i. Security Line Module utilize resistor technology to interpret the status of a door or equipment. Resistance factors tell the alarm input the condition of the door or equipment (i.e. forced opening, door propped open too long, duress, line fault, etc.)
j. Door Status Contact Switches signal the Security Line Module when the state of the door changes (i.e. closed/open, open/closed). The type of Door Status Contact Switch used is dependent on the type of door being monitored. Considerations are door type and material, frame type and material, rated vs. non-rated doors, etc.
k. LAN/WAN Interface: interface for IP to control panel
m. Memory Expansion Boards
n. Code Expansion Board

Verify with the District for all doors that may require access control.

16.15 TELECOMMUNICATIONS INFRASTRUCTURE

.01 Verify the infrastructure backbone with the District prior to initial design. Obtain Record Documents and verify field conditions prior to design. See attached Palomar College ISP Design Guideline.
.02 UPS - See attached Palomar College preferred UPS schematics. The actual size and duration of the UPS shall be verified with the District.
.03 Structured Cabling Infrastructure shall be Leviton/Superior Essex Category 6A system.
.04 Fiber Infrastructure shall be air-blown fiber (ABF) Sumitomo single mode from dual pathways.
.05 Interlink all IDF rooms on each floor for redundant feed.
.06 Provide analog phone at each classroom/lab for emergency purposes. Verify and coordinate with the District regarding phone numbers and locations. Locate the phone at the front of the classroom near the teaching station.
.07 In all cases, review of this system with the District IT personnel is required. Verify all requirements with District IT staff.

16.16 SURVEILLANCE CAMERA SYSTEM

.01 Surveillance Camera Digital Video Recorder (DVR): 16 Channel DVR, 120 frames per second, 160Gb Hard drive installed with Windows interface. Check with District for Windows version required.
.02 Remote Viewing Software: Client software package (included w/DVR)
.03 Camera Power Supply
.04 Fixed Camera: 1/3" High Resolution, color camera
.05 Fixed Camera Lens: Varifocal Lens 3.5 - 8mm, f1.4
.06 Fixed Camera Mount: 20lb, light duty, adjustable wall or ceiling mount as required.

.07 Fixed Camera Enclosure (Environmental): Environmental enclosure w/wall or ceiling mount arm (for outdoor applications)

.08 Pan, Tilt, Zoom Camera
- a. Indoor: environmental enclosure, heater, camera, and lens
- b. Outdoor: environmental enclosure, heater, camera, and lens

.09 Pan, Tilt, Zoom Camera Mounts
- a. Parapet Mount: Provide separate power transformer
- b. Wall Mount: Grey with 24VAC power supply (must be connected to 115VAC circuit)
- c. Pole Mount Adapter: Use with IWM series
- d. Ceiling/Soffit Mount: Ceiling mount for IWM series
- e. Viewing Monitor: 17" TFT LCD Flat Screen Display

END OF DIVISION 16