

Version 2026.2

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PART 1 - PREFACE

Background

The Long Beach Unified School District (LBUSD) is continuing to improve their facilities and build new facilities as a part of their construction and renovation building. A building program of this magnitude involves many different projects and design professionals. LBUSD has prepared this Facility Design Standards (FDS) to create uniformity with respect to quality and type of materials and systems to be incorporated into the various designs.

These Facility Design Standards were developed through a series of meetings with District staff and reviewed by several departments. Additionally, the team met with manufacturer's representatives and specialty contractors to determine the best and most current product selections.

The items included in these Facility Design Standards have been selected based upon life cycle cost, durability, ease of maintenance, sustainability and value. They were coordinated with the requirements of Collaborative for High Performance Schools, Best Practice Manual (CHPS) requirements.

Objective

The goal of the Facility Design Standards is to provide the Design Professionals working for the Long Beach Unified School District with direction that will produce a uniform and consistent product**. It is not the intent of these Standards to dictate the project work scope.** These Standards include procedural requirements and required products. It is the Design Professional's responsibility to develop scope within the budget established as the project progresses through the design phases per their Agreement.

These Facility Design Standards do not address all items required for all projects. The intent is to address the District concerns and those items that require standardization. Specialty products unique to an individual project not addressed in these Standards must be reviewed and approved by the Designated District Representative prior to completion of Construction Documents.

Overview of Facility Design Standards

The Facilities Design Standards are divided into four volumes.

Volume 1	Design Standards
Volume 2	Specifications
Volume 3	Document Standards
Volume 4	Planning Standards

Volume 1: Design Standards addresses the District's general standards for design. These are the items required to be incorporated into the project design documents. It also provides information on compliance and variance procedures.

Volume 2: Specifications provides specific information on products and materials via the outline specifications. The outline specifications are to be used as a guide and are **not** to be pasted into the Design Professional's documents and are only available in PDF format. Master Specifications are provided for select sections. These sections are available in Microsoft Word and are to be edited by the Design Professionals

Volume 3: Document Standards covers the requirements for the Contract Documents including deliverables and formatting. Both CAD and BIM delivery methods are described.

Volume 4: Planning Standards are reference documents inclusive of three components: District Wide Master Plan, Educational Specifications and Planning Design Standards. The Educational Specifications is general background information upon which these standards were based. The Educational Design Standards graphically illustrate the various spaces in LBUSD schools and reflect the requirements described in Volumes 1, 2 and 3.

Each volume is intended to complement the others and taken in total are the District's Facility Design Standards.

Compliance with Standards

The District welcomes suggestions to improve these standards; however, deviations from these standards need to be specifically approved, in writing, by the District's designated representative. Please refer to the Variance Request Form in the Appendix of this volume. Any Variance Requests should be submitted as early in the design phase as possible. It is the objective that continued input from the Design Professionals, District staff, and other stakeholders will result in continuous improvement of the design standards.

This document will be continuously evolving due to enlisting comments from users and changing codes and products. The most current versions are available at the District's website at https://www.lbschoolbonds.net/facilities-design-standards Please coordinate with the designated District Representative to ensure you are on the notification list for updated postings. The Design Professional and its consultants shall review all District issued updates of the Facilities Design Standards through completion and approval of the Design Development Phase. Upon completion of each review of the Facilities Design Standards updates, the Design Professional shall notify the designated District Representative in writing within seven-days indicating changes that affect the current design and the proposed costs for any additional services and/or time needed to revise the documents accordingly. The Design Professional is not responsible for reviewing changes made to the Facility Design Standards subsequent to the acceptance of the Design Development Phase. If the District desires a specific change to the standards after the accepted Design Development Phase, the District will request a proposal from the Design Professional to incorporate the change. The Design Professional shall only proceed with changes upon written authorization from the District.

General Construction Projects

The Design Professionals will be provided with a general project scope description and construction budget in their Agreement. It is the responsibility of the Design Professionals to refine the scope and comply with these Standards within the established budget.

Renovation Projects

The Design Professionals will be provided with a general project scope description and construction budget in their Agreement. It is the responsibility of the Design Professionals to refine the scope, comply with these Standards for those items included in the project scope, and stay within the established budget.

Rebates and Saving Programs

The Design Professionals will investigate rebate programs offered by Local, State, and Federal Governments, utility agencies and other organizations. The Design Professional is to provide information on potential savings or rebates, including but not limited to Southern California Edison, that can be recognized and then apply to the program if authorized by the District. Southern California Edison's contact:

SCE Account Manager
Southern California Edison
Office: 714-895-0649

Collaborative for High Performance Schools (CHPS)

The Long Beach Unified Board of Education adopted the Collaborative for High Performance Schools (CHPS) Board Resolution encouraging the effort to ensure that eligible projects meet or exceed minimum CHPS Criteria to the extent feasible. The CHPS requirements have been integrated throughout these Facility Design Standards. A symbol "🌎" has been inserted in areas that are affected by CHPS certification and need to be coordinated with the District's suggested CHPS scorecard. Design Professional to coordinate with the District Representative to determine if project will be a CHPS project.

END OF PREFACE

PART 2 – GENERAL AND NEW CONSTRUCTION DESIGN STANDARDS

I. Criteria and Agency Standards for Construction Projects

A. The projects included under this section apply to all buildings on LBUSD campuses. Where renovation projects are involved, the criteria must be applied when the scope of work includes the elements described. These standards are not meant to dictate scope, but rather clarify the requirements when included in the project specific scope statement.

B. The following Standards represent the District's goals. However, these items may need to be modified due to budget constraints and specific project requirements. The construction projects have a "design to budget" clause in the Owner - Architect agreement. It is the responsibility of the project architect to provide independent estimates and, if necessary, make recommendations to the designated District Representative for revisions to these Standards to allow the project to be constructed within budget.

C. The sustainable building design requirements address the following areas of concern: environmental considerations of orientation and location of buildings, incorporation of natural daylighting and ventilation in classroom spaces, indoor air quality, low VOC materials, sustainable building materials, energy efficient lighting and mechanical equipment, low water consumption and building commissioning.

D. The District practices recycling for economic and environmental reasons. The Design Professional must acquaint themselves with the District's recycling programs and provide facilities that accommodate the programs.

1. The District uses the City of Long Beach's recycling bins and the City's pick-up service.
2. The District recycles Styrofoam containers used in serving food.
3. The District requires recycling of construction waste as defined in CHPS and as required by local ordinances.

E. The Design Professional is required to assist the District in obtaining State approval and funding when State funds are used for a project.

1. California Department of Education (CDE)

a. The District will hire a consultant to prepare the CDE application.

b. The Design Professional must assist the District's Consultants by providing project data and the preparation of a site and floor plans for CDE review and approval. The Design Professional must consult CDE's website http://www.cde.ca.gov/index.asp for plan requirements.

i. The site plan will require property lines, distances from key features to the property lines, site area, parking, pedestrian paths of travel, playgrounds, and drop-off areas.

ii. The floor plans will require square foot areas and identification of each space.

c. The Design Professional shall revise the drawings at the request of the District's Consult ant and the Department of Education in the time frame requested. Multiple revisions may be required.

2. Office of Public School Construction (OPSC)

a. The District will hire a consultant to prepare the OPSC application.

b. The Design Professional will assist the District in preparation of Form SAB 50-2 School Capacity Calculation http://www.documents.dgs.ca.gov/opsc/Forms/SAB_50-02.pdf

c. The Design Professional shall provide a site plan and preliminary cost estimate on the OPSC standard spreadsheet. The estimate will delineate off-site improvements and measures required to make the site usable such as retaining walls and hazardous materials abatement.

d. The Design Professional shall revise the estimate at the request of the District's Consultant and the OPSC and will document, or accept, costs disputed by OPSC.

e. The Design Professional will prepare the necessary application for the High Performance Grant Incentive on eligible projects.

3. Department of Toxic Substance Control (DTSC)

a. Unless specifically required in the Contract, the Design Professional is not responsible for preparation or approval of a Phase I, Phase II hazardous materials assessment or the Remedial Action Work Plan (RAW).

b. The Design Professional shall be familiar with the requirements of the Remedial Action Work Plan and accommodate the abatement work. In some cases, projects may require phasing or import of fill to replace contaminated soils removed.

4. The California Environmental Quality Act (CEQA)

a. Unless specifically required in the Contract, the Design Professional is not responsible for preparation or approval of the environmental documents.

b. The Design Professional shall incorporate mitigation measure required by the environmental documents.

F. The Design Professional is required to obtain approvals from agencies having jurisdiction over the project.

1. The Design Professional must submit the application, fee and deliver the set to the approving agency. Please refer to the Owner-Architect Agreement for additional requirements. The District will provide a check for the plan check fees. The Design Professional must request the check six weeks prior to submittal and must provide

documentation on how the fee was calculated.

2. Approvals to be obtained from the following agencies:

   a. Division of the State Architect

   b. California Geological Survey

   c. Local Fire Department

   d. Local Health Department

      i. Projects located within the City of Long Beach fall under City Health Department jurisdiction. All other cities fall under County of Los Angeles jurisdiction.

      ii. City Building Department or Public Works for off-site improvements.

      iii. For the City's Guidelines and Drawing Templates please refer to Volume 3.

G. Cultural Significance

1. The Design Professional is to coordinate with the designated District representative and CEQA consultant regarding any buildings of cultural significance.

2. The Design Professional shall attempt to maintain the cultural quality of the campus and integrate new designs into that context with review and approval from the District.

3. District approval is required for removing cultural items or modifying cultural facades.

4. Cultural Significance: Please refer to Appendix for the WPA preservation requirements.

H. Hazardous Materials

1. No materials or products containing hazardous materials shall be specified or otherwise allowed for use on any project. Must follow local and state regulations when applicable.

I. Commissioning

1. All new construction projects, projects participating in CHPS certification, and modernizations over 10,000 square feet shall be commissioned by a third-party Commissioning Agent, CxA, for the following systems as indicated, per the California Energy Code and California Green Building Standards Code.

2. Systems to be commissioned are required based on project types:

	New Construction – CHPS Designed	Modernization > $1 million – CHPS Designed	Modernization < $1 million - CHPS not required
Building Envelope	Design Only	Design Only	Design Only

HVAC	Include	Include	Include
Building Hoods	Include	Include	Include
Lighting Controls	Include	Include	Optional
Domestic Hot Water	Include	Include	Optional
Irrigation	Include, per code	Optional	Optional
Renewable Energy	Include, if applicable	Optional	Optional

3. System Requirements:

   a. Design Phase:

      i. Building Envelope: to include window openings, skylight systems, building finishes such as plaster, and material transitions with complete detail review of sheet flashing, joint sealants, etc.

   b. Design and Construction Phases – Refer to Volume 2 Specifications for sections with commissioning requirements and coordinate with the designated District Representative and District Commissioning Agent, CxA, for the following systems:

      i. HVAC Systems: to include appropriate systems specification and compatibility of the total heating, ventilation, and air conditioning design.

      ii. Building Hoods: to include laboratory fume hoods, kitchen hoods, kiln hoods, and any other proposed exhaust hood for functionality, sequence of operations and systems compatibility with building HVAC systems.

      iii. Lighting Controls

         a) Interior lighting control devices and network lighting control systems for exterior lighting for functionality, compatibility, efficiency, and code compliance.

         b) Theatrical lighting and stage dimming systems, as necessary during construction only. Coordinate with the designated

District Representative and site staff to determine the need for commissioning based on the complexity of proposed systems.

iv. Domestic Hot Water Plumbing: to include heating systems and controls for functionality and efficiency.

v. Irrigation: to include the complete irrigation system design for compatibility with existing site utilities and compliance with State AB1881 directives.

vi. Renewable Energy: to include photovoltaic technology or other renewable energy systems including Battery Energy Storage Systems (BESS), as required by Title 24 or to meet additional District requirements, if included in the project scope.

I. Site Design Standards

A. Crime Prevention through Environmental Design (CPTED)

1. Projects must employ the principles of CPTED.

a. Natural surveillance – the design and placement of physical features in such a way as to maximize visibility. There shall be no hiding places or areas of impaired visibility. Avoid isolated gathering areas and blind spots in corridors.

b. Access Management – the physical guidance of people coming and going from a space. Access management defines and directs legitimate users to the safest way into and out of buildings, parking areas and pedestrian walkways. Access management may also direct students, staff and visitors past key locations for contact, communications and observation. The entire perimeter of the campus is to be fenced with limited, controlled access points, and the building compound should have secondary fencing and limited, controlled access points to enable restricted access for community use during non-school hours.

c. Territoriality – the delineation of private, semi-private and public space or the use of physical attributes that express ownership. A well-defined space that appears to be "owned" will tend to encourage acceptable behavior while discouraging illegitimate or disruptive users. Clean and well-lit spaces tend to encourage positive social interaction. Incorporate areas for supervision of gathering places.

d. For additional information refer to the National Crime Prevention Council's website at: http://www.ncpc.org.

B. General Site Layout

1. The site design shall be designed to maintain the following separations:

a. Pedestrian and vehicular traffic.

b. Staff parking and student parking.

c. Parent drop-off and bus drop-off areas.

d. Transitional Kindergarten/Kindergarten and Upper Grades.

e. For TK-8 schools, lower grades 1-5, and upper grades, 6-8.

f. Separation from drop-off lanes and parking lot.

2. Provide ample lighting in parking lots and along the path of access to the office and between buildings.

3. The campus layout must encourage community access and joint use. Libraries playfields and gymnasiums are often joint use areas. Coordinate with the District the joint use requirements in Master Planning phase. Where joint use is anticipated, the facility must be separated from the remaining portions of the campus when the facility

is in use by the public. Obtain a Memorandum of Understanding or other document to obtain the CHPS point.

4. Site buildings away from sources of noise and air pollution, such as streets and parking lots. Comply with California Department of Education for Title 5 requirements.

5. Design site to accommodate emergency vehicular access, including ambulance and fire trucks.

6. Provide truck access to trash enclosures and delivery points for supplies.

7. Provide space for recycling bins provided by the City of Long Beach. The bins will be rolled out to curbside for City pick-up. Provide sufficient quantity to accommodate all the school-population's recycling.

8. Provide safe dispersal areas as required by the code. Use playfields where possible.

9. Electrical service transformer and switchgear locations to be coordinated and approved by Southern Californian Edison (SCE) during design development and prior to the start of work. The Design Professional will meet with the utility to discuss scope of work and to address any potential issues prior to construction. The utility yard shall have a concrete pad and either a concrete masonry unit (CMU) enclosure or opaque metal fence depending on design, locking metal gates, and a chain link cover. Cover to be removable for SCE access over transformers and meters. Chain link enclosure fencing is also allowed, however not preferred.

C. Import Fill Material Requirements

1. Imported fill should be free from environmental contaminants and should consist solely of native soil and rock materials. No recycled materials should be imported onto a school site and must not be mixed into or in any way made a part of any other material. Thus, crushed miscellaneous base, crushed brick mixes for baseball diamonds; etcetera must never be specified. Organic materials, such as decomposed granite and those which contain a mixture containing organic materials (e.g., rice hulls), must be individually approved.

2. Imported materials must be suitable for engineered fill, even if used at landscaping, free from large rocks.

3. Imported materials shall not have high clay content and must meet the permeability requirements of the projects' hardscape.

D. Architectural Site Items

1. Provide a minimum 8-foot-high ornamental fence at main entry and other prominent locations to secure the building compound. Detail and coordinate fabrication to accommodate gate hardware. Include tight mesh screening to secure areas around panic hardware to prevent unauthorized access.

2. Provide a minimum 10-foot-high galvanized chain link fence around the perimeter of site. Chain link fencing is also allowed at utility enclosures. Interior site fencing may have a galvanized finish.

3. All parking lots and access driveways are to have vehicle gates. The preference is for swinging gates over sliding gates. If a sliding gate is necessary, it must be designed on

a level rail for ease of operation. Sliding gates to have a "V" track on the bottom with in-line wheels and guild wheels at the top of gate posts to stabilize gate. Do not specify motorized gates.

4. The maximum leaf of a sliding gate is 20-foot (15-foot opening). The height is to match adjacent fencing. For bi-sliding openings, the maximum width is 26-feet.
5. Pedestrian gates to be maximum 8-foot high, with transoms at taller fences. Vehicle gates to be the same height as adjacent fences.
6. Design fencing in a manner to ensure that it does not provide access to roofs.
7. Show site concrete on architectural and civil site plans. Include score lines and details on the architectural plan. Show paving sections on the civil plans.
8. Design six-inch by six-inch concrete mow strips (with #4 reinforcing bar) between turf areas and planters, buildings, or other obstructions. Coordinate concrete work with architectural site work drawings. Provide 12-inch wide concrete mow strip on either side of chain link fences where turf is planted adjacent to fences.
9. Where asphalt abuts the building, provide a 12-inch concrete edge bordering the building to eliminate asphalt touching the building.
10. Do not locate raised planters adjacent to buildings. Raised planters, retaining walls, concrete benches, stand-alone handrails and other low barriers to have integral skateboard deterrents, such as notched concrete or other means to avoid smooth edge.
11. When providing unit pavers, secure perimeter pavers in concrete setting bed.
12. Site stairs to be concrete without metal nosings. Provide tooled nosings with contrasting color stripes.
13. Coordinate access gates, fire lanes, access roads, remote pumper, and fire hydrant locations with the local fire jurisdiction.
14. Provide access for ride-on mowers to all turf areas, including curb cuts, ramps and gates.
15. Parking Lots and Access Roads:
    a. Asphalt bus and truck access roads and portions of parking lots shall have a 4-inch asphalt over 12-inch crushed aggregate base section, unless the geotechnical report provides specific recommendations.
    b. Other asphalt paving shall have a 3-inch asphalt over 8- inch crushed aggregate base section, unless the geotechnical report provides specific recommendations.
16. Do not use pulverized asphalt for base.
17. Do not use rubberized asphalt paving.
18. Sports Fields can be either natural turf or artificial turf. Running tracks shall be decomposed granite or synthetic surfacing. Consult the District Representative on a project-by-project basis for the type of sports field to be used.

a. Artificial Turf: Provide synthetic turf installation complete with an irrigation system for disinfecting and cooling and drainage system. Do not specify rubber pellets.

19. Exterior walkways: Where doors swing into exterior walkways, integrate the door swing path into the paving design.

20. School Gardens: Only include when specifically included in the project scope, design raised planters with irrigation, per the District's standard detail included in the Appendix.

21. Include a non-obtrusive paved location on site, ten-foot by twenty-four- foot (10' x 24'), to accommodate an eight-foot by twenty-foot (8' x 20') emergency preparedness cargo container.

22. Design Professional to consult with District if additional outdoor athletic equipment storage is necessary beyond the Education Specification requirements. If so, cargo containers may be used and must have the necessary paved area(s) to accommodate the bin(s).

23. Provide a location adjacent to a building, which can accommodate a 25- foot by 8-foot mobile trailer for Maintenance repairs. Building must have an electrical receptacle approximately 10-feet above finish floor for trailer to be plugged in. Coordinate with Electrical requirements in the succeeding section.

E. Playground and Playfield Equipment

1. Design Professional to propose layout and features to designated District Representative prior to starting Construction Document phase.

2. Hardcourt area shall include a painted number system: Emergency Numbers at Elementary Schools and PE Roll Call Numbers at Middle and High Schools. Coordinate exact numbering system and location with District Representative.

3. Design playground equipment in accordance with the National Program for Playground Safety (NPPS) standards and provide design options to the design team.

4. Equipment to be a composite structure.

5. Kindergarten playground equipment needs to accommodate 40 students. All other playground equipment needs to accommodate 60 students.

6. Kindergarten equipment shall include no upper body apparatuses.

7. Provide minimum 3 ½ inch thick rubber mats or per fall requirements.

8. Do not specify poured in place rubber playground surfacing.

9. Do not specify equipment with over 30 activities.

10. No moving parts.

11. No tunnels.

12. Ball Walls: provide 12-foot wide by 8-foot-high walls.

13. Tether Ball: Provide 10-foot high, schedule 40 galvanized pipe with 3/8- inch stock ring at the top.

14. Bike Racks: Provide chain link fencing around bike rack area for security and locate the enclosure in an approved visible area on site. Quantity of racks is site specific and should be determined by the project/site needs. Provide concrete yard to accommodate bike rack anchors.

15. Exterior Basketball Courts: Provide 16-foot high 5 9/16 inch diameter post with 6-foot extension. Posts are to be single (not double or back-to-back) with a straight and square backboard. For middle school and high school mount backboards at 10-foot to top of the goal ring and 9-foot for elementary school.

16. High School Baseball and Softball Fields:

    a. Dugouts may be chain link and do not need to be recessed.

    b. Provide fixed benches in the dugouts.

    c. Provide concrete pads for portable bleachers.

    d. Portable bleachers shall be CFCI.

    e. Provide a drinking fountain and bottle filling station.

    f. Provide a batting cage with galvanized chain link and non-climbable mesh.

    g. Provide quick coupler connections so that the infield and the batting cage area can be watered down periodically.

    h. Coordinate power requirements at the field and batting cage with electrical.

17. High School Backstops:

    a. Provide galvanized chain link fencing with 2-inch mesh and top, middle, and bottom rails.

    b. Minimum of 20-feet high and higher where required.

    c. Provide boards up to five feet high.

    d. Provide vertical fencing only, no horizontal fencing.

18. High School Exterior Scoreboards:

    a. Provide a wired control, even if the scoreboard is wireless.

F. Site Furnishings

1. Outdoor Tables and Waste/Recycling Receptacles - Include anchored outdoor tables and paired landfill and recycling receptacles in the construction contract. Anchored metal trash receptacle housings, as specified in Volume 2, shall be used in all outdoor areas except designated student eating areas. Student eating areas shall not use metal housings. Landfill receptacles shall be grey, and recycling receptacles shall be blue.

2. Eating Area Waste Stations (Including Compost): Student eating areas shall provide a three-stream waste system consisting of grey landfill, blue recycling, and green compost receptacles. Compost receptacles shall be installed only in student eating areas. All eating-area receptacles shall be free-standing containers as specified in Volume 2, without metal housings.

G. Site Accessibility

1. Review existing site access from public right-of-way(s) for compliance with current ADA requirements for path of travel including landings, signage, path-of-travel, railings, and other requirements.

2. Review parking lot access and accessible parking access to site. Verify stall count, van accessible locations, ramps, signage, lighting, and path of travel is compliant with current ADA requirements.

H. Site Concrete

1. Thickness and base requirements for site concrete to be determined from the geotechnical report recommendations.

2. Reinforce concrete with minimum #3 reinforcing bars at 18 inches on center, each way.

3. Control, construction, and expansion joints shall be identified and indicated on the drawings and detailed.

4. Provide dowels at all expansion joints and when new concrete adjoins existing concrete.

5. Non-structural concrete flatwork should be specified at 2,500 PSI, unless otherwise required by soils report. Non-structural flatwork shall be excluded from the DSA test and inspection form.

6. Do not use colored concrete.

7. Do not use textures other than medium broom finish or top-cast etching at horizontal concrete. Obtain permission from the District to implement design concepts that require patterns, textures, or colors in site concrete.

8. Slope all sidewalks and hardscape, surrounding planter areas, towards the landscape.

I. Civil (Site Service Utilities, Grading and Drainage)

1. Obtain geotechnical report with percolation test data from the designated District Representative.

2. Water monitoring: Provide a system that provides District-supervised, water

monitoring at the site.

3. A qualified civil engineer or SWPPP consultant is required to prepare and obtain approval of the SWPPP. Require contractors to provide and maintain erosion control and all-weather access during construction per the approved Storm Water Pollution Prevention Plan (SWPPP). Obtain from the designated District Representative the Department of Water Resources (DWR) "SMART" website access information.

4. In addition to requiring the contractor to notify Dig Alert and local utility service providers, require the contractor to hire an underground utility locating service and identify underground utilities prior to start of construction.

5. Coordinate and verify building utility services tie-ins with existing infrastructure capacity and with the local utility companies. Confirm available utility capacities and available gas and water pressures. Incorporate findings into the Field Report due at the end of the Schematic Design phase.

6. The grading on the site should be balanced to avoid import or export of soil. Provide a balance calculation including the spoils generated by footing excavation.

7. Separate landscape areas from paved areas with a moisture barrier that will prevent irrigation water from migrating under paved areas.

8. Retaining walls and raised planters to have a drain system tied into the storm drain system. Show points of connection for retaining wall foundation drains.

9. Provide drain inlets at downspout discharges for indirect connection. The downspout should discharge onto drain inlet grate with enough clearance to service the drainage structure. Coordinate inlet structure with footing design.

10. Storm drains underground piping to be straight pipe with structures for cleanout at the changes in direction. Avoid the use of "Y" fittings when possible.

11. Drainage Structures:

    a. Catch basins to be concrete, with 12-inch square minimum grate size.

    b. Provide bottoms on catch basins.

    c. Set basins in six inches of gravel base.

    d. Inlets in sump conditions or recessed areas shall be designed for relief overflows to prevent inundation of buildings

    e. Parkway culverts to be minimum 4-inches high.

    f. Locate drainage structures away from or outside of play fields.

g. When needed, provide bioretention swales (bioswales) to mange, treat, and infiltrate stormwater runoff in accordance with approved site plans.

12. Slopes and Drainage:

a. Minimum slopes for asphalt concrete shall be 1 percent.

b. Minimum slopes for concrete pavement shall be 0.5 percent.

c. Concentrated flows in asphaltic concrete areas shall be contained in a 3-foot wide concrete drainage gutter with 8-inches of base below. Use horizontal reinforcing bar in gutters and dowel joints.

d. Maintain 2 percent slopes for grass fields.

e. Grass slopes shall be maintained at 4 to 1 or flatter to allow for mowing. Steeper slopes shall be planted with landscape shrubs or ground cover.

f. Refer to code requirements for specific slope restrictions based on locations and site context. Do not design to code maximum where possible to accommodate some construction tolerances.

13. Site Water Mitigation:

a. See landscape requirements for irrigation water mitigation.

b. Installation and location of drainage retention devices shall be determined on site characteristics based on geotechnical and hydrology reports.

c. Use retention basins only when no other alternative is available.

d. Submit water mitigation methods to the District prior to implementation.

e. Comply with DWR and CHPS requirements for water run-off.

14. Review water services requirements including fire service connections with local water purveyor prior to design. Confirm typical details used by the agency.

15. Coordinate placement of double detector check assemblies for water and fire services with local water purveyor and designated District Representative who will coordinate with the District's Operation and Maintenance Department. Detector assemblies shall be accessible from adjacent street and secured with approved locking devices.

16. Survey:

a. Topographical and Underground Utility Surveys should be provided by the Design Professional as part of the project deliverables. The Design Professional shall provide sufficient information to allow for a site plan and civil drawings that provide the requirements below.

i. Design shall be based on established and verified bench mark for site.

Use of assumed elevations or temporary bench mark will not be allowed.

ii. Provide site contours at 0.5-foot elevations on a 25-foot grid.

iii. Provide and show site boundary including bearings and distances for property lines on the plans.

iv. Provide horizontal controls for key structures.

v. Provide AutoCAD drawings that can be used by the surveyor to lay out the site. Make the drawings available to the survey or during construction.

b. Require a licensed surveyor to perform the construction work and certify building pads on completion.

17. Piping:

a. Underground water piping 3-inch and under shall be copper. Larger pipe to be PVC.

b. Fire service lines shall be PVC piping.

c. Sewer piping shall be SDR 35.

d. Coordinate with plumbing engineer to ensure compliant slope and proper drainage is achieved.

e. Storm drain pipe to be PVC. Only use concrete when required by local agency for tie-in. Do not use corrugated pipe.

f. Wrap metal pipe, regardless of soil conditions.

18. Trenches:

a. Native soil is the District's preferred backfill to avoid materials export. Compact to 90 percent or higher when required by soils report.

b. Provide metallic warning tape 12-inches below grade above utilities.

19. Standard Details:

a. Use City Standard Details for work in the public way.

b. Use LBUSD standard details that are included as a part of these standards in the Appendix.

c. Provide project specific details on the plans and specifications based on Greenbook standard details where applicable. Do not just reference Greenbook details or requirements.

20. Testing: Require flood testing, including landscaped areas in presence of inspector to confirm drainage.

J. Landscaping

1. General Landscaping Requirements

a. Design Professionals to obtain from the designated District Representative the agricultural suitability soil test and percolation test for determinations on landscape requirements.

b. Landscaping is to be as maintenance free as possible.

c. Refer to the Appendix for Tree, Shrub, and Ground Cover Plant Palette and standard installation detail.

d. Avoid import/export with the goal of balancing material on-site whenever possible. Coordinate requirements with grading plans. Note that all import materials are required to be tested for compliance with DTSC requires. Refer to Import Fill Materials Requirements.

e. Use organic soil amendments to help restore the health of disturbed soils. Evaluate condition of existing topsoil and specify amendments as appropriate. Utilize on-site soil whenever possible.

f. Develop master landscape design character and theme for school sites. Site design shall be zoned in student accessible green space and non-accessible green space, e.g. front of school, parking lots, quads, play fields, building adjacencies, buffer zones, and pedestrian traffic areas. Differences in design criteria will occur based on grade level.

g. Employ Crime Prevention Through Environmental Design (CPTED) strategies. Refer to General Site requirements for additional information.

i. No hiding spots with clear sightlines and visibility. Maintain visibility through landscaping from street for police patrol.

ii. Ensure that key areas (parking, bicycle storage, drop-off points, play equipment, entries) are easily observable from inside the building

iii. Coordinate tree placement with video surveillance cameras. Allow visual surveillance of all entries from inside the school

h. Adhere to State AB1881 directives, group plantings appropriately based upon water use.

i. Preserve existing vegetation, especially groups of plants or significant specimens wherever possible.

j. Coordinate with civil and architectural storm water design impact on landscaping and irrigation systems that slow water velocity, maximize its use for irrigation, and filter pollutants. Minimize maintenance requirements for bioswales. Utilize best management practices for fine grading and drainage.

k. Coordinate with designated District Representative for construction schedule to accommodate the following requirements:

   i. All turf areas are to be hydro-seeded and planted at least 90-days prior to occupancy to be established enough for use at time of occupancy. See Volume 2 Specifications for additional information.

   ii. All other plantings are to be planted 90-days prior to occupancy.

l. Select planting to enable compliance with CHPS requirements for water usage and mitigation.

m. Planter areas are to have weed fabric installed and four inches of shredded bark mulch. Apply mulch in planting areas to prevent weed growth, protect soil, reduce water loss, and prevent irrigation from washing into other areas.

n. Planter areas shall have proper drainage. All raised planters are to have sub-grade drainage in addition to surface drainage. Coordinate with civil requirements and drainage plans.

o. Specify ground cover and shrubs in lieu of turf in areas too small to accommodate ride-on mowers. Avoid turf areas less than 72- inches clear.

p. Emphasize plant diversity to develop and maintain a healthy natural system.

q. Create planting groups by specifying varieties of plants that are similar in native habitat and drought tolerant with reduced watering requirements.

r. Prepare planting designs that layer plant types; use a mixture of sizes at initial plantings; and plan for plant succession.

s. Clearly define planting zones by intended use – for example, lawns for play; tree groves for shade and habitat; shrub masses for buffering and screening, etcetera.

t. Design plantings to allow space for full-size mature growth of each species with space for maintenance access. Specify and locate plants within planting areas so that trees and shrubs will not 'over- grow' their location requiring excessive pruning.

u. Introduce plants to increase habitats – for example, attracting butterflies and hummingbirds.

v. Design with line of sight in mind at driveway corners.

w. Do not plant under stairs.

x. Design Professional to include Plant list on the drawings that include all quantities and sizes for bid purposes.

y. Educational Applications

   i. Landscape spaces should extend the teaching opportunities

beyond the classroom walls. There are many themed garden alternatives, providing a myriad of educational opportunities applicable to early childhood programs through advanced high school curricula, which can be implemented within landscape areas. These include:

a) Seasonal Change Gardens
b) Edible and Harvest Gardens
c) Watershed or Hydrologic System Gardens
d) Southern California Zone Gardens
e) Native Gardens
f) Drought-tolerant Gardens
g) Habitat Creation Gardens
h) Soil Remediation Gardens
i) Sensory Gardens
j) Wellness Gardens
k) Historic and Cultural Gardens
l) Sculptural and Artistic Gardens

2. Plant Selection:

   a. Refer to District standard plantings as included in the Appendix.

   b. Design Professional to propose the project specific plantings to designated District Representative for approval prior to proceeding with design.

3. Tree Locations and Design:

   a. Locate trees in a manner that avoids the mature canopy from overhanging the buildings and have adequate separation between trees to avoid canopies from connecting.

   b. Coordinate location of trees with underground utilities. Do not locate trees where underground utilities exist or are planned.

   c. Locate trees a minimum of fifteen-feet from buildings, canopies, fences and underground utilities. Consider access for tree trimming equipment, such as a boom truck, for large trees.

   d. Design a minimum of a fifteen-foot separation between trees and paving surfaces to prevent mature roots from damaging walkways, hard courts, and parking lots. Alternatively, specify root barriers to prevent spread of roots under paving. Refer to landscape details included in the appendix.

   e. Show on plans the mature canopy size and note the mature height of trees.

   f. Utilize deciduous shade trees to provide some summer shading of parking lots. Use root barriers to prevent root spread under paving. Refer to

landscape details included in the appendix.

g. Utilize deciduous shade trees to provide summer shading around ball fields and hard courts.

h. Locate trees to reduce solar heat gain and minimize glare. Planting deciduous trees on the southeast, southwest, and west side of the building will reduce solar gain in summer during the morning and afternoon. Plant low branching deciduous trees on the west side to keep low afternoon sun off west and north walls in summer.

i. Locate tree rows or tall hedge rows to provide visual and sound blocks if needed

j. Where trees are located in planter areas or at existing trees, specify groundcover or cobbles under drip line.

k. Trees shall be deep rooted. Do not use shallow rooting trees.

l. Coordinate planting schedule with watering schedule so that the different initial water periods do not compromise the health of the plantings.

m. Trees to be a minimum of 24-inch box size.

n. Consider window locations to optimize and enhance outdoor views when placing trees.

o. Coordinate tree placement with exterior lighting fixtures.

4. Turf Areas:

a. Concrete headers should be utilized, when possible, at turf areas. Redwood headers are acceptable when a concrete header is not feasible. See Appendix E for standard landscape details.

b. Restrict turf areas to large, active use spaces. Use groundcover and/or no-mow grasses in narrower, passive spaces.

c. Limit turf areas to those large enough to accommodate ride-on mowers.

d. Design adequate clearances around trees in turf areas to accommodate ride-on mowers.

e. Coordinate with architectural standards for the necessary access with curb cuts / ramps for ride-on mower access to turf areas. Minimum six (6) foot access on turf areas.

K. Irrigation

1. Refer to the appendices for Tree, Shrub, and Ground Cover Planting details for District standard deep bubbler detail for trees.

2. Use recycled water where available.

a. Coordinate requirements of County of Los Angeles Health Department for projects outside of the City of Long Beach and with the City Health Department for use of recycled water.

b. Use purple pipe and box covers at recycled systems.

c. Provide appropriate warning signage for recycled water.

d. No hose bibs or equipment couplers are allowed on reclaimed water services.

3. Design Professional to coordinate location of irrigation main riser and backflow preventer within the utility yard in manner that will accommodate a booster pump if required.

4. Design Professional to coordinate electrical service to booster pump if necessary and irrigation metering requirements.

5. Verify available water pressure and include irrigation booster pump or pressure reducer in contract, if necessary to maintain adequate water pressure. Incorporate findings into the Field Report and design as necessary.

6. Adhere to State AB1881 directives

   a. Include landscape water budget calculations showing compliance with CHPS.

   b. Eliminate overspray and runoff

   c. Operate irrigation system based upon climatic conditions

7. The use of drip irrigation is highly discouraged; design the site in compliance with AB1881 without confining the project to options that require drip irrigation. For designs where drip irrigation is unavoidable, submit a Variance Request for District review.

8. Install low-volume, water-efficient irrigation or systems connected to humidity sensors

9. Install irrigation systems to avoid runoff, low-head drainage, overspray, or other similar conditions where irrigation water flows onto adjacent property, non- irrigated areas, or impervious surfaces.

10. Irrigation system installation should provide easy access to sprinkler heads for inspection and maintenance.

11. Use irrigation zones to group plants with similar water needs close to a water source, which limits the scope and impact of an in-ground irrigation system.

12. Landscape Architect will confirm existing conditions on site with designated District Representative and obtain their approval of schematic layout and controls prior to

proceeding with system design.

13. Design a loop system with isolation gate valves to separate each individual ball field and landscape zone when possible.

14. Irrigate trees with deep bubbler irrigation system.

15. Irrigate shrubs and groundcover with spray system in areas allowed by AB1881.

16. Irrigate turf with pop-up heads in areas allowed by AB1881.

17. Specify LXME2-PRO series controller based or smart controller with web access wireless data plan and remote control. Allow for 4 of the stations per clock to be for future use. Specify separate time clocks for shrubs and turf areas. If a project requires more stations than the LXME2-PRO provides, review project needs with District Grounds Representative to discuss an acceptable controller.

18. Locate valves away from turf areas and outside of ball field boundaries.

19. Work on the irrigation system, including hydrostatic, coverage, and operational tests and the backfilling and compaction of trenches shall be performed prior to planting operations.

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II. Building Design Standards

A. General Requirements

1. Please refer to Volume 4 - Planning Standards for additional programming requirements.

2. The schools are to serve as an emergency evacuation shelters.

3. Designs shall utilize simple rectilinear shapes.

4. Day Lighting

   a. Perform daylight and view model to determine placement to incorporate indirect, diffused, and natural day-lighting. Provide sun protection of windows to avoid direct sunlight during the summer months. Address glare concerns during winter months. Use skylights, tubular skylights, clerestory windows, and light wells to introduce natural light in occupied rooms.

      i. Do not allow direct sunlight into the spaces.

      ii. Obtain recommendations from the mechanical engineer on the U values and solar heat gain coefficient required for the glazing. See Windows and Glazing section for additional details.

      iii. Only use skylights in rooms that are "landlocked" in the building, are occupied, and cannot receive shared light from perimeter windows.

      iv. Do not use internal lights in tubular skylights.

      v. Glass is not allowed as a skylight material.

      vi. Provide safety devices around skylights so that staff working on the roof cannot step or fall through the skylight.

      vii. Skylight curbs must be no less than 8 inches high (finish height). Coordinate curb height to properly cricket for positive drainage and meet both the skylight and roofing manufacturer requirements.

      viii. Use manufacturer pre-glazed units. Do not specify custom or special-order products.

      ix. Provide translucent glazing in restrooms, locker rooms, and other areas where visibility is a concern.

      x. Refrain from using daylight sensors and controls in classrooms and teaching spaces

5. Provide overhangs at exterior doors large enough to protect users during rain. Recess windows or provide overhangs to prevent direct rain from hitting the windows.

6. Provide natural, cross-ventilation, where practical, in addition to mechanical ventilation. Provide operable high and low windows and oriented to the prevailing breezes.

7. Construct building primary structures with concrete, concrete masonry units, brick, plaster, steel studs, wood framing, and structural steel members.

8. The primary consideration for building materials is to provide a low maintenance facility. Exterior wood is not allowed. Metal siding, at interiors or exterior, is not allowed.

9. The structural grid system should be laid out in modules divisible by four- foot increments.

10. Exterior soffits to be a solid surface with insect screens at vent. Do not use perforated metal.

11. Room Layouts: Design rooms around the furniture and equipment layout.

B. Requirements by Room Type

1. Classrooms:

2. Elementary and Middle School classrooms shall have wall mounted marker boards centered on wall with integrated AV systems. Refer to Volume 4 Planning Design Standards for Classroom Sample Layout drawings.

3. High School classrooms shall have wall-mounted marker boards, centered in the classroom, and a minimum of two tall cabinets. Refer to Volume 4 for the Classroom Layout drawing

4. Locate space and electrical provisions for the teacher's desk at the front of the classroom, perpendicular to the wall, and facing the students. For additional information, refer to Electrical Requirements for Construction Projects and Volume 4 for Teacher's Desk and Classroom Layout drawings.

5. Provide computer, printer, and document camera for teacher's desk.

6. Locate foam soap dispenser and paper towel dispenser at all sinks. Refer to Volume 2 Specifications for further dispenser requirements.

7. Provide pre-wrapped tackable wall covering panels over gypsum board.

8. At Elementary School classrooms, provide standard size panels for the majority of the wall where possible.

9. At Middle and High School classrooms, provide panels in standard sizes to the top of the door header.
10. Provide suspended 2-foot by 4-foot acoustic ceilings at classrooms.
11. Provide carpet with resilient flooring around the sink and walk-off mat at exterior entry door with rubber base.
12. Provide backpack/storage hooks for students' belongings at code accessible reach height, based on student age, directly outside or just inside classroom. Provide and install hooks such as Polycarbonate Plastic Hooks by HangSafe Racks or Approved Equal. Hooks to be Contractor Furnished Contractor Installed (CFCI). Coordinate placement of hooks to allow 180 degrees door clearance.
13. High School Auditoriums:
14. Meet with the District and the site committee, prior to starting design, to review the needs of the facility. Determine the features, type of rigging, seating capacity, joint use options, and rental options.
    a. Retain a theater consultant for rigging, front, back and side stage curtains, theatrical lighting, audiovisual, and sound system.
    b. Retain an acoustic engineer.
    c. Propose seating, aisle lighting and associated seating accessories prior to starting Design Development phase. Coordinate dimensions with manufacturers.
    d. Provide 22-inch-wide seats if space is available.
    e. Provide fold-away writing tables if required, at lecture halls, auditoriums, or performing arts centers.
    f. Coordinate power and data service packages if required at lecture halls, auditoriums, or performing arts centers.
    g. Provide seat and row number plates on fixed seating.
    h. Design backstage workshop and storage areas with large roll-up doors to exterior and to the stage.
    i. Design enclosed control booth with lighting and sound controls. Also design alternate control location backstage.
    j. Provide carpet in the aisles and sealed polished concrete in seating areas.
    k. Provide plywood wood flooring with rubber base at stages.
15. Band and Choral Rooms:
    a. Design band and choral rooms to accommodate portable risers.

b. Provide portable risers of size and height to accommodate the programmed number of students.

c. Provide high ceilings.

d. In new construction, locate adjacent to the theater.

e. Retain an acoustical engineer. Review sound transmission and sound reverberation

f. Provide sound-isolation practice rooms.

g. Design storage for chairs, music stands, instruments, sheet music, and uniforms. Instrument storage is to be located in specialized lockers.

h. Provide sliding marker boards with storage at the front of the classroom.

i. Provide instrument repair area and instrument cleaning area with sink. Locate foam soap dispenser and paper towel dispenser at all sinks. Refer to Volume 2 Specifications, for further dispenser requirements.

j. Provide an instructor's office.

k. Provide carpet roll-goods with rubber base.

l. Coordinate the Technology requirements in the succeeding section.

m. Add music staves to marker boards. Marker board size to determine number of staves.

16. Gymnasiums:

a. Provide motor operated, telescoping bleachers that do not interfere with the regulation basketball court or four wrestling mats and required court clearances in fully opened position.

b. Coordinate with manufacturer representative for appropriate rise and row spacing.

c. Coordinate headroom clearance at top row of seating with basketball backstops of cross courts.

d. Wood sports flooring shall be continuous wall-to-wall, extending beneath the retractable bleachers. Provide flush installation at all transitions. Reinforce the wood flooring system as recommended by the wood floor manufacturer to accommodate bleacher wheel loads and movement during operation. Coordinate bleacher weight and movement requirements with the wood flooring manufacturer prior to installation.

e. Incorporate the use of natural day-lighting, but do not allow direct sunlight to hit the gym floor or to be visible to athletes using the facility.

f. Provide sport wood flooring system with manufactured vented metal base and painting of team logo in the main center court and school name on each baseline.

g. Note that on projects that have not determined the team logo, do not include in the scope of work. Provide open space for future graphics to be applied under separate contracts.

h. Provide multi-sport colored striping to accommodate main basketball/volleyball court, perpendicular practice basketball/ volleyball courts, and badminton courts.

i. Provide retractable motorized basketball backstops for main court and practice courts.

j. Provide exposed acoustical metal deck.

a. Provide operable clerestory windows for cross ventilation.

k. All courts must conform to CIF requirements and court clearance requirements. Coordinate the retractable practice court backstops for required vertical clearance.

l. Provide porcelain tile flooring with coved tile base at snack bars.

m. Provide sport wood flooring system with manufactured vented metal base at dance rooms.

n. Provide rubber base at weight rooms. Resilient rubber tile flooring at weight rooms.

17. Locker Rooms:

a. Laundry Room:

i. Provide one shared laundry room with adjacent access or secured access from both locker rooms.

ii. Provide a CFCI washer and dryer with a floor drain, dryer vent, lint trap, and a high-volume exhaust fan. Accommodate electric utilities for the dryer. For additional information, refer to Volume 2 Specifications.

iii. Include a sink and counter workspace. Locate foam soap dispenser and paper towel dispenser at all sinks. For additional information, refer to Volume 2 Specifications.

b. Provide an ice machine in each locker room in comprehensive High School gyms.

c. All lockers shall be anchored to concrete bases.

d. Provide a hard lid ceiling.

e. Provide sealed concrete floor finish with sealed concrete curb at locker rooms and team rooms.

18. Media Center (Library):

a. The primary function of a school library is that of an Information Literacy classroom whose cross-curricular content is taught by a teacher librarian. Libraries are changing with technology and can serve different functions on a campus including: research, group meetings, computer instruction, reading place for students' free time, social meeting area, as well as a repository for books. The Design Professional is to meet with the District Representative and Library Services to determine the design and functions of the libraries at each campus prior to proceeding with the design.

b. The Media Center is to include space for whole class and small group teaching, bookshelves, periodical racks with related reading areas, casual seating area, tables and chairs, computers for research and Online Public Access Catalog (OPAC) access, and library security system. Provide Classroom AV system for the Media Center; refer to Technology and Low Voltage Standards.

c. Design the library shelving to accommodate 28 books per student with an average thickness of one-inch per book. The Design Professional is to confirm the amount of book storage prior to the start of design and submit the linear footage provided in the conceptual design phase.

d. Design the shelving to include Catalog Look Up Station(s) at the end of the bookshelf near the center of the room. Confirm number of stations required with District Representative.

e. Design the library that allows line-of-sight supervision from the circulation desk.

f. Provide acoustical treatment to maintain an environment conducive to study. 🌎 Separate group meeting areas with sound barriers.

g. Provide an entry to the library that is readily identifiable and prominent.

h. Provide daylighting in the reading spaces. 🌎

i. Provide audible security alarm devices at exit doors other than the main entry.

j. Provide a teacher librarian's office, checkout counter with provisions for the book scanner, book repair area and storage. The book scanner system will be provided as furniture and equipment.

k. Provide a sink in the book repair area. Locate foam soap dispenser and paper towel dispenser at all sinks. Refer to Volume 2 Specifications for further

dispenser requirements.

l. Provide a circulation program at the primary exit.

m. Provide a book detection system at all High School Media Centers primary exits. At Elementary and Middle School Media Centers, provide adequate power near the circulation desk for potential future installations of book detection systems. Refer to Technology and Low Voltage Standards for additional information regarding the book detection system

n. Make provisions on the campus, but not in the library, for textbook delivery, storage and distribution. Textbook distribution and collection occur at the beginning and end of each school year.

o. Center stacks to be 4-foot high and perimeter wall stacks to be 6-foot high.

p. Provide carpet roll-goods with rubber base.

q. Provide pre-wrapped tackable wall covering panels over gypsum board.

i. At Elementary School classrooms, provide standard size panels for the majority of the walls where possible.

ii. At Middle and High School classrooms, provide panels in standard sizes to the top of the door header.

19. Science Laboratories:

a. Science laboratories are to be designed by a laboratory consultant or person with specialized knowledge of laboratories.

b. Coordinate specific project scope requirements with the designated District Representative. Laboratory design should be tailored to the science to be taught.

c. For the LBUSD approved chemicals and quantities list, contact District Curriculum Science Office:
hwww.lbschools.net/departments/curriculum/curriculum-areas/science

d. Submit the document to DSA at plan check.

e. Laboratory equipment and casework are to be provided by a company specializing in laboratories. Do not use the Architectural Woodwork Institute to specify scientific casework.

f. All plumbing fixtures are to be per plumbing standards. Do not specify the faucets, valves, and gas outlets provided by the lab casework.

g. Countertops and integral sinks are to be epoxy resin. All countertops are to be detailed with a 4-inch overhang at all peninsulas.

h. Provide specialty cabinets as required by the site committee, including integrated technology, fume hoods, flame-proof cabinets and chemical storage. Windowed doors may be used at upper cabinets only.

i. Provide one fume hood in each Chemistry classroom and Chemistry preparation room. All other science classrooms and preparation rooms do not need a fume hood.

j. Conceal all ductwork on fume hoods.

k. Include preparation rooms for each laboratory, preparation rooms may be shared by two or more laboratories.

l. Provide CFCI refrigerator and freezer in shared preparation rooms. For additional information, refer to Volume 2 Specifications.

m. Show peninsula style casework, with accessible seating, and a teacher's demonstration desk at each laboratory. Provide all utilities used in the laboratory at the demonstration desk.

n. Provide accessible stations for teachers and students.

o. Locate foam soap dispenser and paper towel dispenser at all sinks. Refer to Volume 2 Specifications for further dispenser requirements.

p. Provide linoleum roll-goods flooring with integral coved base.

q. Provide pre-wrapped tackable wall covering panels over gypsum board. Specify panels in standard sizes and provide to the top of the door header.

r. Coordinate requirements with plumbing, mechanical, and electrical engineers for:

i. neutralization tank

ii. emergency eye wash stations

iii. floor drains for emergency showers with drainage basin and grate

iv. emergency shut-off valve

v. fume hood ductwork and plumbing

vi. make-up air requirements.

20. Kitchens:

a. Middle and high schools use different layouts and equipment than elementary schools. The items below are not used at elementary schools.

b. Kitchens to have windows for directly serving students with point-of-sale data. Refer to Technology and Low Voltage Standards for Point-of-Sale system.

c. Window sill and counter height at service windows to be level at a consistent accessible height.

   i. Line up areas outside the windows to be separated with galvanized railings.

   ii. Coordinate with District Representative for review by Nutritional Services locations for exterior mobile carts which will access exterior WAPs for connection to point of sales system.

d. Employ a kitchen consultant to determine:

   i. Number of serving windows based on number of meals served per hour required for the student population.

   ii. Size of the dry food storage space, freezer, and refrigerator.

   iii. Equipment plumbing and electrical service requirements and clearances.

e. Kitchens to have a walk-in freezer accessible through the refrigerator with an adjoining door. Floors are to be quarry tile, freezer floors to be insulated. The walk-in units are to have separate condensing units. Multi-circuited condensers are not acceptable.

f. Finishes to comply with health department requirements and:

   i. Ceilings to be 2 feet by 4 feet suspended acoustical ceiling systems with washable white vinyl facing.

   ii. Base to be quarry tile to match floor tile.

   iii. Walls behind sinks, stoves and ovens to be stainless steel sheet to eight feet above finish floor.

   iv. Backsplashes at sinks to be 18 inches high, stainless steel.

   v. Wall are to be fiberglass reinforced plastic (FRP), smooth, white.

   vi. VI. Built-in counters to be stainless steel.

g. Provide one locker for each staff member working in the kitchen at peak hours.

h. Provide a separate locker area for students working in the kitchen.

i. Provide a single all-gender restroom, unless men's and women's are required by code.

j. Kitchen to have provisions for delivery, trash disposal and recycling.

k. Provide a kitchen manager's office with views that supervise deliveries, exit doors, and kitchen preparation area.

l. The exterior door must swing-out 180 degrees with hold open device.

m. Design an exterior can wash area adjacent to the kitchen and loading dock. Provide a durable wall finish such as tiles or stainless steel. Locate a hose bib and floor drain for washing.

n. Air curtains are required at all kitchen, food service, and dining area exterior doors.

o. Provide space for products from the kitchen that are recycled. Includes provisions for storage and pick-up of recycled material.

p. Make provisions for kitchen generated trash storage and pick-up.

q. Serving counters shall be stainless steel with point of sale and power. Size and configuration shall conform to the District's Standard Details.

r. Provide accommodations for use of washable service trays, including tray washing station and storage area.

s. Review proposed kitchen hood design and specifications with designated District Representative for review by Nutritional Services prior to finalizing Construction Documents.

t. Kitchens to have electric water heaters.

21. Cafeteria:

a. Provide a drinking fountain with bottle filling station in or adjacent to the Cafeteria.

b. Provide resilient flooring. Do not provide walk-off material at Cafeteria. District to provide OFOI removable mat at Cafeteria.

c. Provide window shades at kitchen and kitchen serving windows. Blinds must be cleanable to meet health department requirements.

22. Restrooms:

a. Provide mold and mildew resistant gypsum board ceilings at 9-foot high.

b. Provide porcelain tile floors. Use mortar setting bed on first level and provide a depressed slab on upper level floors to accommodate mortar setting. Floor tiles to be 2-inch by 2-inch, integral colored, non-slip with sanded, 1/8 inch dark colored cementitious grout joints.

c. Provide thin-set glazed ceramic tile at walls to approximately 7-foot high. Preference is for cutting of tile to not be necessary. Use cementitious backer board or fiber-glass faced gypsum board as tile backers over water resistant gypsum board. Wall tiles to be glazed, 4-1/4 inch by 4-1/4 inch, white field tile with accent colored tile patterns, with sanded, 1/8 inch light colored

cementitious grout joints. Show patterns and accent trim on the Construction Documents.

d. Provide code required accessible clearances, plus 2 inches for each horizontal clearance requirement, except at water closets and other code mandated hard-dimensioned items.

e. Sloped floors away from doors and toward floor drains. Provide multiple floor drains as required to achieve a 1 percent slope to the drain. Provide a marble door threshold on interior restroom doors.

f. Do not utilize urinal partition screens.

g. Restroom Accessories:

i. All accessories are Contractor Furnished Contractor Installed (CFCI), unless noted otherwise.

ii. Mirrors in student restrooms are to be stainless steel mirrors without shelves. Staff Restrooms are to have float glass with stainless steel frame mirrors without shelves.

iii. Design restrooms to prevent visibility into the restroom with consideration given to the line-of-sight visibility of mirrors.

iv. Hand dryers at student restrooms, except dedicated Kindergarten.

a) Air only; warm air hand-dryers are not allowed. If hand-dryer location shares a wall with a Classroom submit a Variance Request. Typically, there will be one hand-dryer for every two sinks.

v. Paper towel dispensers:

a) In the staff restrooms, public restrooms, Kindergarten restrooms, and other non-restroom sink locations, specify paper towel dispensers. Recessed and combination waste receptacle accessories are not preferred and should only be used when space is limited.

b) Do not specify automatic paper towel dispensers.

vi. Trash Receptacles, use accessories at single compartment and staff restrooms. District to provide trash receptacles in student, multi-compartment restrooms.

vii. Protective Seat Covers only at staff restrooms, auditoriums, gyms, joint use, and other toilet rooms that the public will be using.

viii. Feminine Sanitary Napkin Disposal Receptacle: one per stall, at all restrooms (girls, all-gender). Install one per stall at one boys' restroom

per campus at grades 6-12. Do not install at dedicated preschool, TK and Kindergarten restrooms.

ix. Feminine Hygiene Product Dispenser, OFCI, grade levels 6-12, include one (1) dispenser per restroom at student restrooms: girls, all-gender restrooms, and one (1) boys' restroom per campus.

x. Soap Dispensers, to be OFCI, foam soap, and wall-mounted. In multi-stall restrooms, place a minimum of one soap dispenser for every two sinks. Indicate dispenser locations on the drawings and provide backing at dispenser locations, when required. For additional information, refer to Volume 2 Specifications.

xi. Non-accessible stalls:

a) Specify surface mounted multi-roll toilet paper dispensers.

b) Individual accessories preferred over one combined accessory (for example, toilet paper dispenser and feminine sanitary napkin disposal are separate accessories).

c) Specify surface mounted partition accessories in lieu of double-side accessories that require cutting the partition and/or accessories.

xii. Accessible stalls:

a) Specify accessible standard sized multi-roll toilet paper dispenser.

b) Combined/recessed units are acceptable, as well as individual items, if space permits.

h. Provide wall backing required for installation (show wall backing detail on drawings).

i. Extend ceramic tile behind and above mirrors.

j. Specify and detail overhead braced floor mounted vandal resistant stall dividers.

k. Coordinate requirements with mechanical, plumbing, and electrical for:

i. Exhaust tie-ins

ii. Keyed light switches

iii. GFI receptacles.

23. Custodial Rooms:

a. Provide floor-mounted mop sink, hot water, and mop rack. Design to accommodate Owner Furnished Owner Installed cleaning product dispensing

system above mop sink with cold water hose bib at six- foot above finish floor.

b. Provide a CFCI washing machine and dryer in one custodial room per school. Coordinate floor drain, dryer vent, and lint trap for washer and dryer. For additional information, refer to Volume 2 Specifications.

c. Door must swing-out 180 degrees with hold open device.

d. Provide floor drain.

e. Provide fiber-reinforced plastic (FRP) wall panels around mop sink. Extend 12 inches beyond the mop sink and extent to 8 feet above finished floor.

f. Provide CFCI metal storage shelving and a locking metal storage cabinet in each Custodial Room. Include anchorage details. For additional information, refer to Volume 2 Specifications.

g. Provide mold and mildew-resistant gypsum board on walls.

h. Provide exhaust fan with wall louver. Avoid use of door louvers when possible. Screens or mesh will be required at all louver locations.

i. If water heater is in the room, provide sufficient space for access to storage and sinks. Include painted floor striping for areas adjacent to equipment that are required by code to be kept clear.

j. Provide ¾ inch plywood sheathing to accommodate anchorage of racks, and hooks on all walls. When possible, expose and paint the plywood that extends to eight feet above the finished floor. When not possible due to fire rating requirements, provide ¾ inch plywood sheathing from floor to ceiling behind the gypsum board on all walls.

k. Provide a phone and data outlet with protective cover adjacent to power.

l. Provide sealed concrete floor with sealed concrete curb.

24. Storage Rooms:

a. Include in construction contract all required heavy duty metal shelving units and provide anchorage details. For additional information, refer to Volume 2 Specifications.

b. Where locking metal storage cabinets are required, provide as CFCI. For additional information, refer to Volume 2 Specifications.

c. Chain link fence may be utilized as partitions in storage and utility rooms.

d. Provide sealed concrete floors with rubber base.

25. Mechanical and Electrical:

a. Access to utility rooms shall not be through classrooms.

b. Provide an electrical room to include electrical panels, inverters, and other power related devices. The room must be ventilated. Only step-down transformers may be located inside buildings, at Electrical, MDF, and IDF rooms.

c. Mechanical Rooms. Provide mechanical rooms for furnaces or other air handling equipment. Do not combine mechanical rooms with other functions.

d. Include painted floor striping for areas adjacent to equipment that are required by code to be kept clear.

e. Provide sealed concrete floors with rubber base.

26. Main Distribution Frames (MDF) or Head End Equipment, and Intermediate Distribution Frames (IDF) Rooms:

a. MDF Rooms

i. Locate MDF on first floor only and size room a minimum of 10 feet by 15 feet clear inside dimension and rectangular in shape. Follow BISCI TDMM Best Practices.

ii. MDF shall be accessible with interior doors only that swing outwards and not to the interior of the room. Provide a 42-inch- wide door with no louvers or glass and locate in the middle of the wall.

iii. Provide an MDF room with enough space to include all low voltage systems' head end equipment. Maintain a minimum of 36-inch clearance in the front and rear of each rack. Include 3 fully enclosed server racks (one for MDF, one for SASI, one for Intercom system,).

iv. Coordinate Technology, Electrical, and Mechanical requirements with the succeeding sections.

b. MDF and IDF Rooms:

i. Provide fire-rated plywood backing wrapping walls 8 feet high by ¾ inch thick, with “A” side facing out, painted off-white.

ii. Provide sealed concrete floor.

iii. Provide a dedicated split system AC or air-source heat pump with gravity fed condensate lines. Room will require dedicated air conditioning 24/7/365. Ventilation only is not acceptable. Dedicated AC will apply to dedicated rooms. Rooms with shared function must be evaluated.

iv. Do not run plumbing lines, roof drains, AC systems, condensate lines, or other utilities not serving the MDF or IDF in or above this room.

v. Confirm room envelope (ceiling, walls, doors) to avoid conditioning

interstitial or adjacent space.

c. Intermediate Distribution F`rames (IDF) Rooms:

i. Size the IDF rooms a minimum of 10 x 10 feet clear inside dimension with a square plan. Follow BISCS TDMM Best Practices.

ii. Locate IDF to be accessible with interior doors only that swing outward and not to the interior of the room.

iii. Provide an IDF enough space to include, intermediate low voltage systems, 36 inches of clearance around the rack, and include a minimum of two racks.

iv. Do not design with wall mounted IDF racks. Utilize fully enclosed server racks.

v. Provide one IDF per floor and stack IDF rooms.

27. Maintenance Room

a. Provide one Maintenance Room per school.

b. Size the room a minimum of 10 feet by 12 feet.

c. Do not provide windows to this room.

28. High School Pool:

a. Pool must meet CIF requirements to be a competition pool.

b. Coordinate pool supply room and ventilation requirements for chemicals and items to be stored.

c. Specify FRP doors at chemical storage rooms.

29. Administration / Lobby:

a. Design of Administration area needs to force visitors through the lobby and be a control point in lieu of allowing visitors to enter the school before entering the lobby area.

b. Receptionist must have visibility of the cots within the Nurse's office.

c. Provide a built-in reception desk and transaction counter with high-low counter. Include open space below the countertop to accommodate Owner-furnished (F&E) two-drawer vertical file cabinets.

d. Distance between the reception desk counter height and transaction counter needs to be able to accommodate a binder (13-inches minimum between the two surfaces).

e. Coordinate program requirements and a rough furniture plan for adequate

power receptacles and data outlets at open administrative office areas.

f. Provide a built-in display case and an area for messages to be pinned for parents/visitors to read.

g. Provide countertop space near sink and casework at the Nurse's office. Casework to include drawers and storage cabinets below the countertop and tall storage cabinets.

h. Locate foam soap dispenser and paper towel dispenser at all sinks. Refer to Volume 2 Specifications for further dispenser requirements.

i. Provide space and electrical provisions to accommodate Owner-furnished (F&E) metal desk in the Nurse's office.

j. Provide a CFCI refrigerator in the Nurse's office. For additional information, refer to Volume 2 Specifications.

k. Provide visibility from the Principal's office of the school's courtyard or play field.

l. Provide visibility from the mailroom to the reception/lobby area.

m. Fire alarm annunciator must be in a planned and coordinated location. The site plan fire alarm zoning map will be provided as CFCI.

n. Provide a key cabinet within a secure room in the Administration office, such as the secure file room.

o. Provide a CFCI wall-mounted, lockable metal storage box to store 11 x 17 inch plans of the school near the key cabinet.

p. Provide space within the secure file room and the reception area to accommodate a safe with clearance in front of and above the unit. Allow space for an OFOI safe that may be roughly 24 inches wide by 24 inches deep by 24 inches high and will be anchored to the slab.

q. Mailboxes to be 12-inches wide by 12-inches deep by 4- inches high. Provide 1 mailbox per 12 students based on the maximum capacity of the campus. For example: If the school's maximum capacity is 3,000 students, provide 250 faculty/staff mailboxes.

r. Provide carpet with rubber base at offices and administration areas.

s. Provide linoleum roll-goods flooring with integral coved base at Nurses' Office.

t. Offices and conference rooms to have suspended 2-foot by 4-foot acoustical ceilings.

u. Provide pre-wrapped tackable wall covering panels over gypsum board for wall finishes at offices. Specify panels in standard sizes and provide from +34 inch sill height to the top of the door header.

30. Art Classrooms:

a. Kiln ventilation system is to be designed and specified as recommended by the kiln manufacturer.

b. Provide sealed concrete floor with sealed concrete curb.

c. Coordinate equipment requirements per specialized programs, such as spinning wheel stations, lockable clay bins, adequate casework and open shelving for storage, trough sinks, minimum door clearance, etc.

31. Corridors:

a. Provide sealed concrete with integrated waterproof membrane under topping slab with top-cast finish at second story exterior walkways and balconies.

b. Provide linoleum roll-goods flooring with integral coved base at interior corridors.

32. Kindergarten:

a. Provide a minimum of one toilet per kindergarten classroom; two classrooms may share a boys and girls restroom to meet this requirement, if space is limited.

b. Provide carpet with resilient flooring around the sink and walk-off mat at exterior entry door with rubber base.

c. Use base cabinets in lieu of cubbies.

33. Multipurpose Room:

a. Provide linoleum roll-goods flooring with integral coved base.

34. Teacher and Staff Dining Rooms / Break Rooms:

a. Teacher and staff dining should be adjacent to the kitchen.

b. Provide accessible sink, single bowl, with lever handle mixing faucet, and spray. Provide a 3/4 horse-power garbage disposal. For additional information, refer to Volume 2 Specifications.

c. Provide an open countertop space near sink area with enough space to accommodate Owner-furnished (F&E) microwave oven and coffee maker for staff dining and break rooms.

d. Locate foam soap dispenser and paper towel dispenser at all sinks. Refer to Volume 2 Specifications for further dispenser requirements.

e. Provide casework that includes drawers and storage cabinets below countertops.

f. Provide space and electrical provisions to accommodate two Owner-furnished (F&E) vending machines, one coffee maker, one microwave, one refrigerator, and one garbage disposal. For additional information, refer to Electrical Requirements for Construction Projects.

35. Staff Workrooms:

a. Provide open countertop space with casework. Casework to include storage cabinets above and below.

b. Provide space and electrical provisions to accommodate Owner-furnished (F&E) printer/copier/scanner equipment. For additional information, refer to Electrical Requirements for Construction Projects.

36. Textbook Storage Rooms:

a. Provide CFCI adjustable metal shelving, high and low countertop space with casework. Casework to include drawers and storage cabinets below countertops and storage cabinets above countertop. For additional information, refer to Volume 2 Specifications.

b. Provide space and electrical provisions to accommodate Owner-furnished (F&E) computer and scanner equipment. For additional information, refer to Electrical Requirements for Construction Projects.

37. Special Education Classrooms (Moderate / Severe):

a. Confirm Special Education Classroom flooring requirements.

b. Provide a CFCI washing machine and electric dryer at Elementary School Special Education Classrooms.

c. Provide a CFCI refrigerator and freezer unit, washing machine, electric dryer, dishwasher, combination residential, electric stove top, range, and oven, and range hood at Middle School and High School Special Education Classrooms.

d. Coordinate floor drain, dryer vent, and lint trap for washer and dryer. For additional information, refer to Volume 2 Specifications.

e. For additional equipment information, refer to Volume 2 Specifications.

38. Common Core Laboratories:

39. Common Core Laboratories are to include the same teaching components and room finishes of a standard classroom.

40. Refer to the Specific Room Requirements of Computer Labs in Electrical Requirements for coordination of computer station provisions.

a. Provide a minimum of one dedicated Common Core Lab per school. Refer to the Education Specification requirements to determine laboratory quantities required at individual schools, based on eligible student population.

b. Each Common Core Lab should accommodate:

c. At Elementary Schools: 36 computer stations

d. At K-8, Middle, and High Schools: 40 computer stations

e. At least one Common Core Lab per Elementary School shall be located on the first floor.

f. Common Core Labs may not be considered teaching stations. If existing spaces are converted or shared, mobile carts and equipment accommodations must be coordinated with a District Representative.

C. Color Selection

1. The Design Professional is to propose color selections in the Design Development phase. All color selections are to be finalized before the construction documents are completed.
2. Refer to the Document Standards for color board requirements and additional information regarding material and color selection.
3. Limit exterior paint scheme to two colors: one main body color and one accent color. For design proposals exceeding two colors, submit a Variance Request for District review.
4. Specify low VOC paint for both interior and exterior paint applications.
5. District's Standard Paint Colors:

Color Name	Manufacturer	Color Number	Application
Navajo White	Dunn Edwards	DEC772	Interior Walls Exterior Walls and Trim
Swiss Coffee	Dunn Edwards	DEW341	Interior Walls Exterior Walls and Trim
Sahara	Dunn Edwards	DEC747	Exterior Walls and Trim
Black	Dunn Edwards	DEA187	Ornamental Fencing
Praise Giving	Vista Paint	VP 0540	Flag Poles* Exterior Accents
White	Dunn Edwards	DEW 380	Ceilings
LBUSD Red	Dunn Edwards	VP22-109426	Exterior Accents
LBUSD Maroon	Dunn Edwards	VP22-100740	Exterior Accents
Purple Trinket	Dunn Edwards	DE 5979	Exterior Accents
Woodlawn Green	Dunn Edwards	DEC779	Exterior Accents
Vibrant Honey	Dunn Edwards	DE 5314	Exterior Accents
Luna Pier	Dunn Edwards	DE 5888	Exterior Accents

LBUSD Blue	Dunn Edwards	VP22-110410	Exterior Accents

D. Exterior Finishes

1. Finishes must be durable and low maintenance
2. Flag poles should only be painted if already painted. Do not apply paint to the finishes unless it is already painted.
3. Plaster is to be integrally colored and receive a paint finish.
4. Finishes are to be paintable or if exposed masonry, treat with anti-graffiti coating. Planes above eight-feet do not require graffiti coating, however, do not partially coat a plane, even if some portions exceed eight-feet.
5. Non-painted masonry is to be sealed in addition to the anti-graffiti coating.
6. Limit Anti-Graffiti coating surfaces not intended to be painted or painted over such as murals, masonry walls, and buildings or walls that are unsecured, such as those accessible from the street.
7. Exterior Insulated Finish System (EIFS) assemblies are not permitted.
8. Exterior wood siding, wood doors, or wood trim are not acceptable.

E. Roofs

1. Sloped metal roofs are to be used wherever practical. Use of flat roofs shall be minimized unless it is necessary to accommodate rooftop equipment or photovoltaic panels.
2. Design flat roofs to have parapets of 42-inch guard height, minimum ¼ inch slope.
3. Where the use of tie-offs is unavoidable, tie-offs shall comply with maintenance workers safety requirements per CAL OSHA.
4. On sloped roofs (3 inches in 12 or greater) to receive a new roof, use standing seam metal roofing that meets the "Cool Roofing" and "Energy Star" roofing criteria.
5. On low-sloped roofs (½ inches in 12 to 3 inches in 12), to receive a new roof, use modified bituminous roofing that meets the "Cool Roofing" and "Energy Star" roofing criteria. Do not allow the use of pitch pockets.
6. Rooftop HVAC equipment, except small exhaust fans, shall be fully screened from view including economizers, power exhausts and other accessories. Screens shall be integrated into the architectural design, matching the building in material and scale.
7. Design to prohibit that ability to access the roof by climbing security gates, chain link fences, low walls, planters, trees or other access method.
8. Roof access is to be internal in a secure location. No external roof ladders, except to go from one roof level to a higher level. Internal hatch space shall have 36-inch open

clearance (finish opening).

9. Locate accessories 10-feet from roof edges without parapets and 12 inches from cant strips at parapets.
10. Provide tie-offs and safety equipment for the servicing of sloped metal roofing.
11. Design to discourage bird perching and nesting.
12. Design roofs to prevent overlap below or above other roofs.
13. Roof Drains, Gutters, Downspouts, and Rainwater Leaders:
    a. The District's preference is for sloped metal roofs with external gutters and downspouts. Eaves to have gutters and downspouts, including lunch shelters and covered walkways.
    b. Provide external 18 gauge, fully welded, rain gutters. Gutters to have a minimum of 6-inch continuous flange to lap under roofing membrane and be secured with heavy duty gutter anchor straps at a minimum of six-feet on center.
    c. Size gutter profile per SMACNA design guidelines but minimum of 4-inch by 4-inch with ¾ inch turned edge at lip. Detail with outer edge ½ inch lower than roof edge to accommodate overflowing
    d. Do not use internal gutters.
    e. Downspouts are to be constructed of schedule 16-gauge (min) 304 stainless steel (mill finish) pipes below ten-feet (10').
    f. Specify indirect connection to storm drain system via drain inlet at downspout discharge.
    g. Where there are low-slope roofs, the District's preference is internal roof drains with flex connections to the rainwater and overflow leaders. Do not use scuppers or exposed rainwater leaders.

F. Interior Wall Finishes

1. Specify and detail durable, low maintenance interior finishes.
2. All gypsum board to be Type 'X' 5/8-inch.
3. Interior corridors, locker rooms and other areas of high abuse are to have reinforced gypsum wall board
4. Vandal resistant corner guards to be installed in kitchen areas only.
5. Specify impact resistant panels in sport facilities that do not have concrete or masonry walls.
6. Do not specify plaster faced gypsum board.

G. Ceilings

1. Do not specify twelve-inch square acoustical ceiling tiles unless necessary to match existing ceiling.
2. Do not use fire rated acoustical suspended ceilings.
3. Exposed MEP is only allowed in Gyms, Utility rooms, Storage rooms, IDF rooms, MDF rooms, and Custodial rooms. Exposed piping, ducts and conduits are to be painted in Gyms only.
4. No exposed insulation.
5. Install non-sag gypsum board at ceilings and soffits.

H. Concrete Building Slabs

1. Design Professional to recommended assemblies, admixtures and/or sealers to control slab moisture and pH levels as required by the flooring manufacturer's requirements.
2. Coordinate requirements for under slab vapor barrier with wood floor manufacturer.

I. Flooring

1. In carpeted areas, provide walk-off mat on the interior side of all exterior doors. Mats shall be six-foot deep and extend a minimum of 18 inches beyond door frame. Increase size if sink area is located near exterior door.
2. Where non-carpeted interior areas meet an exterior door at occupied spaces, provide a walk-off mat on the interior side of all exterior doors with an accessible, tapered aluminum, anchored frame. Mats shall be six-foot deep and extend a minimum of 18 inches beyond door frame, meeting the corridor walls, edge to edge. Do not specify recessed systems in interior spaces.
3. Linoleum floors to have 4-inch integral coved base unless adjacent to carpeted areas, then specify 4-inch rubber base for continuity. If existing conditions do not allow for integral coving submit Variance Request.
4. Design patterns may be proposed using one main body color and one accent color at corridors and other appropriate areas to create a sense of identification and design impact. Carpet selection is limited to one color and pattern per school.
5. Do not specify VCT or sheet vinyl flooring.
6. Where sealed concrete curb and sealed concrete floor meet, Design Professional to provide detail illustrating how the joint is finished.
7. Please refer to Volume 2 Specifications for the list of District approved carpet manufacturers and collections.

J. Windows and Glazing

1. Exterior windows to include clear, Low-E (hard coating), insulated glass (1" nominal thickness – see Vol. 2 Section 08 80 00 Glazing for additional information) , with thermal break and to be constructed of clear anodized extruded aluminum. Obtain recommendations from the mechanical engineer on the U values and solar heat gain coefficient required for the glazing. The maximum U values, maximum solar heat gain

coefficient, and minimum visible transmittance must meet the most current Building Energy Efficiency Standards Prescriptive Requirements of additions or alterations or comply with Title 24 calculations using performance-based method. Low-E coating should be placed on at least one of the glass surfaces facing the air space.

2. Specify heavy duty hardware with stainless steel hinges and handles on windows. Plastic hardware is not acceptable.

3. Allow for mechanical ventilation per Title 24 Ventilation Requirements. Operable windows should be utilized for cross ventilation due to mechanical failure or outage. Do not include window screens except where required by Health Department (Cafeteria, Dining Room, and adjacent rooms).

4. Operable windows shall be single hung in lower windows and hopper windows for high locations. Design windows so they do not protrude into path of travel when open. Design pole operated hopper windows to open to the interior to allow access for opening and closing.

5. At food service windows, specify double hung windows with operable stainless-steel screens in compliance with the Health Department requirements for maximum size opening, include speaking hole at serving window(s).

6. Design sun shading of windows. Screen from direct sunlight with overhangs or external sun shades.

7. Use fire rated glazing only when other options are not available. Use wire glass or fire doors before using fire rated glazing. Consider eliminating windows that require fire-rated glazing. Avoid need for fire sprinklers water curtains to protect openings.

8. Glazing to be standardized in size for ease of replacement.

   a. Panes cannot be larger than can be handled by one person, maximum five-feet by five-feet.

   b. Specify no more than five pane sizes.

   c. Provide a standard sill height to meet code requirements.

      i. The use of storefront windows must be limited to lobby areas in addition to a limited height to avoid DSA deferred approval. Storefront windows may be used in classrooms with District approval. Curtain walls are to be avoided.

      ii. No glazing below 16-inches.

      iii. The use of insulated polycarbonate glazing systems and similar wall panel systems is prohibited.

      iv. Provide motorized openers at high, inaccessible, windows.

K. Window Coverings

1. Manual operated heavy duty window treatments shall be provided at offices,

conference rooms, nurse's room, classrooms, and other areas where appropriate.

2. Do not specify motorized shades.

3. Do not provide window treatments in gyms.

4. Specify black-out window treatments in the Computer, Chemistry and Physics labs, and other location where applicable.

5. Limit color selection to one.

L. Ramps, Guards, and Handrails

1. Whenever possible reduce the need for ramps through use of sloped walks. Do not design ramps to maximum allowed slope by code to accommodate construction tolerances.

2. Exterior railing to be hot-dipped galvanized steel. Do not paint.

M. Room Numbering, Naming, and Signage

1. Refer to Volume 3 Appendix 'M' for room numbering and room naming convention requirements.

2. Room numbering to be used for access control/electronic door locks, electrical panel labeling, phone assignments, data outlet assignments, building automation system, energy management system, security alarm device addresses and fire alarm device addresses.

3. Room numbers and building signage shall be mechanically fastened with vandal-resistant fasteners or double-stick tape for glass applications, when required. Refer to Volume 1 Appendix E for standard details on room and building signage.

4. Coordinate signage locations with other items that may be in conflict, such as windows adjacent to doors where room identification sign is required to be placed.

5. Room identification signage is required at all rooms, including non- occupied rooms such as utility and storage rooms. Exceptions may include corridors and hallways.

6. Bronze dedication plaques will be provided as OFOI by the District on new schools or renovations of entire campuses. Coordinate a location near the Administration building with the District and provide backing in the wall to support the plaque as part of the construction contract.

7. Refer to local jurisdictions for building signage required at entrances.

8. For site signage referencing towing services or towed vehicles, provide the District's School Safety telephone contact: (562) 997-8101.

N. Doors

1. Exterior doors shall be hollow metal doors.

2. Interior doors shall be solid lumber core wood doors unless in area of high abuse (such as gyms, locker rooms and remote doors subject to vandalism), then doors shall be metal doors. Interior doors shall be paint grade except at office locations that are to be

stain grade.

3. Do not use wood doors at exterior locations.
4. Do not specify wood doors if a fire rating is required over 45 minutes.
5. Use hollow metal doorframes, do not use wood frames.
6. Minimum sized door is 3-foot by 7-foot.
7. No door to be over eight feet high or four feet wide.
8. Doors sizes greater than 3-foot by 7-foot to be increased by 2-inch increments.
9. Door thickness to be 1 ¾ inches, no exceptions.
10. Vision Lite:
    a. Doors shall have a vision light in all locations except utility rooms, custodial office, restrooms, MDF/IDF rooms, gymnasiums, and storage rooms.
    b. The vision lights are to be long (approximately 30 inches) and narrow (approximately 6 inches) to allow better visibility while maintaining security. Coordinate actual size with door hardware requirements.
    c. Use small size and fire rated glass at rated doors, tempered glass at all others.
    d. Doors to music practice rooms shall have half glass, insulate as appropriate for acoustic insulation.
11. Do not provide door frames with transoms or sidelights.
12. Hardware:
    a. Design Professional to submit completed finished hardware specification to the designated District Representative, for review and acceptance with the District locksmith prior to including in bid documents.
    b. Refer to Volume 2 for Master Specification with product and installation requirements.
    c. Keying:
        i. Keying to be tied into the District grand mastered keyway system. The District Locksmith will determine keying requirements.
        ii. District locksmith will key cylinders to be installed after installation of hardware is complete and just prior to Owner occupancy.
        iii. Contractor to have the supplier send zero bitted cores with specified keyway and key blanks directly to District locksmith. Materials must be received directly from the manufacturer 120 days prior to occupancy.
    d. Lever/Locksets:

i. Lock/lever sets to be in accordance with DSA Bulletin 11-05 (AB 211) that allow doors to classrooms and any room with an occupancy of five or more persons to be locked from the inside with a key. Doors that are always locked from the outside and student toilet room doors are exempt.

ii. Unless otherwise specified, exterior and interior locks shall be mortised type.

iii. Student toilet room doors shall have latch bolt thrown or retracted by key outside or lever inside. Students must not be able to lock themselves in room. Rotating inside lever will retract deadbolt. Also include push plates with cutout around the fixed exterior side lever.

iv. Staff restrooms without toilet partitions shall be specified to have thumb-turn locking. Lock can be opened from outside with small screwdriver or emergency override key. Lockset shall show "Vacant" or "Occupied."

v. Storage rooms shall be specified to have an outside lever to always be disengaged. Entrance by key only. Door is always locked with inside lever always unlocked. Only to be used on rooms that is used solely for storage:

e. Exit Devices:

i. Exit devices shall be furnished with rim touch bar device.

ii. Specify keyed removable mullions at paired doors.

iii. Specify with hex dogging where allowed by code.

f. Door Closers: Exterior and fire rated doors to have door closures.

g. Hinges:

i. Exterior doors are to be full length, mortised, continuous hinges.

ii. Interior doors to have five-knuckle ball bearing butt hinges.

h. Stops: Provide floor mounted door stops at doors with a minimum of two fasteners. Avoid the use of wall stops.

i. Door Louvers:

ii. Do not specify exterior door louvers.

iii. Interior door louvers to be heavy duty, vandal resistant, fixed blade louvers.

i. Accessories:

i. Specify door sweep at exterior doors.

ii. Specify kick plates at the base of doors high abuse locations such as gym, locker rooms, restrooms, storage rooms, etc.

iii. Exterior locksets to be equipped with vandal resistant lock guard.

O. Architectural Woodwork / Casework

1. Acceptable finishes are wood veneer, plastic laminate, and paint.
2. Use common woods such as birch, fir, and maple. Do not use exotic or scarce woods.
3. Use woods that are certified by the Forest Stewardship Council (FSC) http://www.fscus.org/ where practical and available. Check cost and availability before specifying.
4. Use bamboo or other rapidly renewable resource where practical and available. Check cost and availability before specifying.
5. Use plastic laminate countertops. Provide backsplashes where countertops are susceptible to water damage such as art rooms and sink cabinets.

P. Acoustical Treatment

1. Comply with CHPS acoustical prerequisite requirements. Refer to Appendix for CHPS standard scorecard.
2. Architectural acoustical treatment is required at all spaces. Acoustical ceilings are the minimum requirement. Carpet and sound absorbing wall panels may be used in lieu of acoustical ceilings.
3. Specify acoustical metal decking when exposed in locations with acoustical requirements.
4. Provide sound insulation in all walls at occupied locations. Fill wall cavities completely.
5. Extend wall framing with sound insulation to room or underside of floor above at conference rooms and other areas where sound transition is a concern, but sound walls are not necessary.
6. Provide staggered stud sound walls in areas where sound transmission is a concern such as occupied areas adjacent to auditoriums, band rooms, band practice rooms, and restrooms.
7. Mitigate noise from mechanical equipment. Coordinate with mechanical equipment provisions for sound deadening.

Q. Concrete Masonry Unit (CMU) Walls

1. Provide furred out walls, when necessary, to accommodate switches, conduits, outlets, etc.
2. At all non-rated walls provide a “block out” opening to run new, existing, and future

conduit through.

3. Detail connections of steel beams between CMU walls with field welded connection on at least one side to accommodate construction tolerances and work sequence.

4. CMU is to be sealed in all cases on the side exposed to weather, or both sides where freestanding and exposed to weather.

5. Limit color selection to two colors: one main body color and one accent color. For design proposals exceeding two colors, submit a Variance Request for District review.

6. Fluted CMU is prohibited.

R. Fire Extinguishers

1. All required fire extinguishers are to be included in the construction contract and installed in semi-recessed fire extinguisher cabinets. Locate in appropriate wall types; wall-mounted cabinets are to be avoided due to accessibility clearance requirements.

2. Provide painted steel cabinets with glazing in the door.

S. Vertical Circulation

1. Building Stairs:

j. Stair risers must be solid.

k. Detail a two-piece aluminum stair nosing; refer to Volume 2, Metal Fabrications, for specific stair nosing.

l. Provide a recessed space near the top of each stair for an OFCI evacuation chair and storage cabinet, Evac+Chair Model 300H and Evac+Chair Secure Steel Cabinet. Provide backing in the wall for wall- mounting the 24-inch-wide, 44-inch-high, 12-inch-deep, 70-pound, steel cabinet (includes 20-pound chair). The bottom of the cabinet shall be within 27 inches above the finish floor, max. Secure Steel Cabinet to be ordered standard non-locking. If conditions do not allow for mounting of the chair and cabinet, submit Variance Request with alternate mounting options.

m. For stairs serving more than two floors or from occupied spaces requiring students to ascend stairs for exiting, coordinate emergency evacuation plan with the designated District Representative.

2. Elevators:

n. Design Professional shall coordinate any required devices in the elevator shaft such as: smoke detectors, heat detectors, and fire sprinklers with the elevator manufacturer, California Building Code, and the State Elevator Inspector.

o. Elevator cabs shall be sized to accommodate standard gurneys.

p. Provide flooring for cab, include on finish schedule on the Drawings.

q. Elevator equipment room and shaft to be rated per code requirements. Size rooms of sufficient size to accommodate the specified manufacturers.

r. Provide access control card reader in addition to key operator to call elevator. Provide in-wall conduit from elevator equipment room for access control wiring. The key operator to call the elevator would be a secondary option so that the elevator would call with the access card or key in case of access control failure.

s. Do not run conduit, water lines, roof drains, or other utility not serving the elevator in these rooms.

3. Accessibility Lifts:

a. Avoid the use of lifts whenever possible. Lifts are not allowed in new construction.

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III. Mechanical Requirements for Construction Projects

A. General Requirements

1. The HVAC system shall comply with the current California Code of Regulations, T-24, the standards of ASHRAE and NFPA as well as the requirements of local authorities having jurisdiction including but not limited to the city and/or county health department for kitchens, air quality management district for emissions and permitting related to boilers, City and County Pollution Control District and Fire Departments for Hazardous materials storage and distribution. Comply with the other provisions of the Long Beach USD Facility Design Standards.
2. All interior spaces shall be air conditioned unless specifically excluded herein or in writing by Long Beach USD.
3. Comply with the minimum requirements of Title 24 energy efficiency standards, however the District encourages the designs to improve on the minimum performance to the extend life cycle cost effective. Consult with the local utility company to take full advantage of incentives for higher efficiency and equipment electrification.
4. All projects are to comply with CHPS requirements. Refer to the Volume 1, Part 6, Appendix D for the sample CHPS score card, and Collaborative for High Performance Schools "Best Practices Manual" (available at http://www.chps.net) for additional criteria.
5. Refer to Volume 2 for the outline specifications for products, materials, and installation standards.
6. Assure maintenance and accessibility provisions for servicing and replacement.
    a. Where practical, all equipment shall be housed within interior equipment spaces within buildings.
    b. Roof mounted equipment may only be employed in designs with the approval of the District. Fixed ladders and roof hatches shall be incorporated in projects where regular access to the roof is required for servicing equipment. Comply with Cal OSHA requirements. Refer to Volume 1, Part VII of District Standards for ladders, hatches and walking surfaces.
    c. Provide adequate working space around equipment for servicing. Coordinate with architectural drawings for required clearance striping.
    d. If components requiring regular service are located above ceiling, they shall be accessible from the floor via portable ladder through access doors or removable ceiling tiles of adequate size to accommodate servicing requirements.
7. Locate rooftop equipment, of any sort, such that guardrails are not required at roof edges.
8. Locate rooftop equipment to maintain proper clearance for code required solar panel area, intake and exhaust separation, etc.
9. Locate mechanical equipment in a manner to minimize noise transmission into occupied spaces. Use vibration isolation, concrete pads and insulated and flexible ducts.

10. Filter sizes shall be standard sizes and shall be limited to the minimum number of different sizes as much as practical. All outside air handling systems shall be equipped with filters that have a minimum efficiency reporting value (MERV) of 16.

11. Equipment associated with the HVAC system shall be screened from view and preferably indoors whenever possible, which aids in vandalism control as well as noise containment and weather protection against deterioration and leaks. All screening shall be designed to minimize restrictions on airflow at the condensing unit to ensure proper heating rejection.

12. For new buildings on existing campuses, the Design Professional is to meet with designated District Representative to help develop phasing schedule and coordinate system design for construction phasing requirements. The goal is to minimize impact to school operations and allow for functioning systems during construction. The Design Professional is to review mechanical as-built drawings, conduct independent site investigations and evaluate existing conditions. Incorporate findings into the Field Report due at the end of the Schematic Design phase and update as necessary in subsequent submittals.

13. The Design Professional will conduct an electrical load analysis to determine whether the existing infrastructure can handle additional mechanical equipment or new buildings.

B. HVAC System Commissioning

1. Coordinate project specific commissioning requirements with the designated District Representative and the District's commission consultant as required for CHPS requirements.

2. Refer to Volume 2 for requirement to specify the coordinated commissioning requirements before the District accepts the project as complete. This includes air balancing and submission of balance reports, mechanical system startup, final calibration and set points for control systems and components, and training of the District's Maintenance and Operations staff for operating and maintaining the systems prior to occupancy.

C. HVAC System Design Criteria

1. Prior to starting design, the Design Professional shall meet with the District's Facilities Planning and Maintenance and Operations Departments and review existing site specific HVAC and plumbing conditions, problems or issues if applicable as well as issues of general concern within the district to avoid repeating problems being experienced on other sites or past projects.

2. The Design Professional is to review scope statement and propose additional scope that may be determined necessary with designated District representative and the Maintenance and Operations Department prior to starting design.

3. Following the initial investigations and consultations with the District, the proposed approach for HVAC shall be presented to the District in a narrative form with catalogue cuts and any drawings or diagrams to amplify or explain approach. This should be done as early as practical, preferably in the concept stage. Design shall not proceed until the approach and concept design is reviewed and accepted by the District.

4. Calculations and Load Criteria

a. Heating and cooling load calculations shall be performed using a computerized load calculation program that is ASHRAE-based and intended for calculating heating and cooling loads for HVAC design. In addition, a computerized energy simulation shall be performed to use in conjunction with life cycle cost analysis and as required by Title 24. A certified program shall be used for compliance, such as Energy Pro. Copies of calculations shall be submitted on request from the District. Equipment shall be sized and selected to handle the heating and cooling loads calculated, and per the requirements of Title 24 and meets requirements identified on the CHPS scorecard. Verify discount rates with District.

b. Outdoor design conditions shall be generally as required by Title 24 and ASHRAE, which are as follows: Winter: 33 degrees F; Summer: 91 degrees F dry bulb/69 degrees F mean coincident wet bulb, and 73 degrees F design wet bulb. Designer shall adjust outdoor design temperatures for site specific conditions as there is a wide variation in climate throughout District, e.g. coastal vs. inland.

c. Indoor design conditions (if not noted below) shall be as required by Title 24 and ASHRAE.

   i. For most occupied, fully conditioned spaces, design HVAC systems to be able to maintain the following conditions: Heating: 70 degrees F; Cooling: 72 degrees F. Thermostat set points however shall be programmed as follows: Heating: 68 degrees F; Cooling: 72 degrees F during occupancy (M-F 7:00 am to 3:30 pm) and Heating : 40 degrees F; Cooling: 99 degrees F during unoccupied periods); does not apply in specialty areas such as music rooms or other spaces where the program requires something different.

   ii. For electrical rooms, maximum temperatures shall be 85 or as otherwise required by the engineer for the equipment installed in the room. Provide with thermostatically controlled exhaust fan, unless the above conditions cannot be maintained, or lower temperatures are required by District or designer for equipment contained in the room.

   iii. Heating only spaces such as locker rooms and gyms, corridors etc., shall be heated to 68 degrees. High occupancy areas should be designed to have multiple sensors to allow an average temperature to achieve a comfortable environment.

   iv. 'Traditional' Shop spaces shall be heated to 68 degrees or provided with infrared heating for occupant comfort.

   v. Kitchens shall be designed for 68 degrees heating and 74 degrees cooling.

vi. IT/MDF/IDF spaces shall be conditioned to temperatures required for equipment contained in the space. These spaces shall be equipped with standalone dedicated HVAC.

vii. Elevator equipment rooms shall be conditioned as required and shall meet all the requirements of the State Elevator Inspectors.

d. Internal loads such as lighting, equipment and number of occupants shall be based on industry practice but shall be validated by District to allow for any unique uses within the District.

5. Systems shall be properly zoned according to exposure and occupancy/usage. No more than one classroom per zone or more than 4 like offices on the same exposure on the same zone.

D. Ventilation Criteria

1. Minimum outside air rates delivered to the occupied spaces shall be in accordance with Title 24 or ASHRAE Standard 62, whichever is more stringent.

2. "Demand Control Ventilation" (CO2 control) of minimum outside air delivery rate shall be used on high occupancy spaces, including multipurpose rooms, cafeterias, gymnasiums, and theaters. Provide override for humidity control.

3. CO2 sensors must be within the design guidelines of ASHRAE Standard or Title 24, whichever is more stringent. Design control systems to provide the Title 24 required daily pre-occupancy purge cycle one-hour prior to normal scheduled occupancy.

4. Pre/Post purge of classrooms 2 hours before and after classroom occupancy. For any new ventilation systems, there must be a capability to decouple from the mechanical system. Part of sequence of operations

5. Specify a 72-hour pre-occupancy building purge at system start-up. Run heating cycle on full continuously for 72 hours with exhaust fans on.

E. Exhaust Criteria

1. Student restrooms shall be exhausted with required minimum air changes per hour and be held at a negative pressure. Design to consider occupancy and volume of the space, adhering to applicable building standards. Fan to be interlocked with EMS system or lights with a 15-minute time delay if no EMS is available.

2. Single occupancy restrooms, such as staff restrooms, shall be exhausted. Exhaust fan should be a single speed, non-ECM motor. Exhaust fan to be interlocked with lighting with a 5-minute time delay.

3. Custodial closets shall be exhausted at a rate of 6 air changes per hour, be held at a negative pressure and be manually switched. Gas water heaters shall not be installed within custodial closets.

4. Exhaust for specialty areas such as shops and other career technical educational (CTE) spaces shall be suitable for functions in the space. Rooms with noxious fumes that cannot be controlled with source capture systems shall be fully exhausted.

F. Acoustic Criteria

1. Noise and vibration control are required for mechanical systems and are critical for the instructional environment. HVAC system must comply with the latest edition of ASHRAE Applications, Chapter 48, Noise and Vibration Control and additional measures required to meet CHPS criteria. It is recommended the designers consult with an acoustical specialist to validate that the mechanical systems are compliance with required noise criteria.

Area	RC (NC)
General Office	30-40
Corridors	40-45
Public Spaces/Shops	40-45
Mechanical Areas	50
Dining/Common	40
Classrooms	30
Administration	30
Libraries/Performing Arts	25
Multipurpose/Gyms	45

2. Internally line, with acoustic duct liner, supply and return ducts for a minimum of ten-feet from HVAC units and exhaust fans, except for moist airstreams such as evaporative cooling, shower exhaust, grease ducts, and the like, that are not suitable for internal lining. On larger air handling systems, acoustical lining may be insufficient and sound traps, heavier gage sheet metal and other strategies may be necessary including vibration isolation of prime movers and distribution.
3. Transfer ducts or grilles between adjacent classrooms, offices and noise sensitive spaces, shall have offsets and lining to control noise.
4. If rooftop units are incorporated, the units shall be generally mounted on spring curbs unless 4 ton capacity or less on moderately stiff roofs. Comply with ASHRAE Acoustical and Vibration guidelines, which recommend spring deflection to be a minimum of 10 times maximum roof deflection at the support points of the HVAC units. Consideration shall be given to lining the inside of the curbs with layers of gypsum board. One-piece curbs are preferred. Curb top shall be a minimum of 8-inches (finish height) above the roof surface.
5. Select diffusers to accommodate minimum/maximum flows without dumping or exceeding space noise criteria previously defined. Place grilles to provide adequate mixing in space and velocity in areas of the occupied zone (three- feet to seven-feet above finished floor) between 50 and 75 fpm.
6. When equipment is mounted outdoors or is inside behind louvered surfaces and adjacent to a property line, the potential exists to exceed the local noise ordinance. Caution must be taken to verify local requirements and design systems to be under the thresholds. Sound ratings shall be completed to verify equipment is under required

thresholds.

G. Indoor Air Quality

1. Minimum outside air rates shall be in accordance with the current applicable version of Title 24, ASHRAE Standard 62.1 or ASHRAE standard 62.2, whichever is more stringent.
2. Mechanical system including heating and air-conditioning systems that circulate indoor air to occupied spaces shall have filters with designated efficiency equal to or greater than MERV 13 when tested in accordance with ASHRAE Standard 52.2.
3. Mechanical systems that supply filtered outside air to occupied spaces shall have filters with designated efficiency equal to MERV 16 and still comply with the minimum outside air rates.
4. Locate outside air intakes away from pollutant sources.
5. Design local exhaust at indoor pollutant sources.
6. Specify low VOC duct materials and duct sealants, as defined in CALGreen.
7. Design control systems to provide the Title 24 required daily pre- occupancy purge cycle one-hour prior to normal scheduled occupancy.
8. Pre/Post purge of classrooms 2 hours before and after classroom occupancy. For any new ventilation systems, there must be a capability to decouple from the mechanical system as part of sequence of operations.

H. HVAC System Selection Criteria

1. HVAC systems shall be selected on the best combination of first cost, cost to operate and maintain, useful life, reliability, flexibility, ease of maintenance and comfort. When a choice exists between multiple system types that meet the criteria, a life cycle cost analysis shall be utilized based on a 20 year life cycle.
    a. Comfort considerations shall include noise.
    b. Cost to operate and maintain shall include considerations for vandalism, energy cost, replacement parts, environmental and permitting requirements.
    c. Consideration shall also be given to the yearly load profile, so equipment can effectively and efficiently operate at all expected minimum and maximum loads.
2. Design Professional to design system to accommodate based on district preferred equipment manufacturers. See Volume 2 Specification for further information.
    a. AHRI Certificate is required for all HVAC equipment where applicable.
3. System types to be considered:
    a. Centralized: Centralized systems consist primarily of central plants with chilled and hot water distribution to remote air handlers or fan-coil units. These systems should be considered on large campus applications, 125,000 square feet and larger. When considering these systems, both air and water cooled chillers should be evaluated as well as high efficiency and condensing style

boilers.

i. Air handlers shall be four-pipe and located in interior mechanical rooms whenever possible. Zoning and associated sizing of air handlers shall minimize reheat for energy efficiency but also respect cost and the other parameters noted above. Air handlers shall be variable flow with electronic speed controllers and compatible motors. Zone control shall be via VAV terminals and hot water reheat when applied with air handlers serving multiple spaces.

ii. In the case of fan-coil units, they shall be applied as required to provide adequate zone control. Fan-coils shall be four-pipe and shall have localized outdoor air provisions or central, dedicated outdoor air. Location shall favor easy access and minimal disruption to the function of the school during routine maintenance. Consideration should be given to variable air flow as well through the use of either ECM motors and controllers or conventional high efficiency motors and variable frequency drives if life cycle cost effective.

iii. Special consideration shall be given to the life cycle cost effectiveness of chillers. Water cooled systems, although generally more efficient may not always be the best life cycle cost, given the high maintenance of the systems. Air cooled chillers with variable speed drives and high efficiency compressors and multi-speed condenser fans can be a viable strategy, especially considering the low load capabilities with multiple compressor units.

iv. When boilers are being proposed, consideration shall be given to high efficiency style and or condensing boilers, however careful attention to water temperatures, minimum flow rates, NOx emission levels and turn-down rates is needed to pick the best boiler for the specific application. Outdoor boilers are not allowed unless approved in writing by the District.

b. Decentralized: Decentralized systems consist of HVAC units which serve a single zone and are relatively ‘stand-alone’ except for the connection of utilities such as gas or electricity. These would include packaged rooftop air conditioners and split system air conditioners. Decentralized (non-heat pump) systems shall be used for 24 hour loads such as IT/MDF/IDF spaces.

i. Packaged, outdoor rooftop systems are generally discouraged however if they are the best life cycle cost alternative and acceptable by the District for that particular application, the desired configuration would be a heat pump with economizer and variable speed power exhaust.

ii. Split systems can include, the following combinations: interior fan/coil units with heat pump condensing unit and built-up economizers. AHRI

Certified Reference Number is required for all split system air conditioners and heat pumps indicating that the indoor and outdoor components are a certified match.

c. Hybrid Systems: These are generally either water source or ground source heat-pumps, furnace closets tied to central chilled water or DX split condensing unit tied to centralized hot water distribution. Multiple evaporator DX/Heat pumps systems would also fall under this category.

   i. Furnace closets tied to chilled water distribution and or split DX tied to hot water distribution shall generally only be used when one or the other distribution infrastructure already exists and can be reused.

   ii. If packaged, constant volume gas-electric or heat pump units are serving larger or more diverse spaces, they shall utilize bypass style VAV terminals and/or thermally powered diffusers, however it is highly encouraged to utilize packaged equipment with variable speed compressors and fully modulating furnaces in addition to variable air flow if available.

d. Variable Refrigerant Flow (VRF) System:

   i. VRF system shall be considered on the projects where the facility conditions are such that replacement with equivalent or approved systems found within Guide Specifications would require significant structural changes, or other major re-work, resulting in substantial occupant displacement, or an increased budget impact.

   ii. The Architecture and Engineering design team shall provide a feasibility analysis and Life Cycle Cost breakdown of the VRF system as compared to other viable options. Obtain LBUSD's written approval prior to the start of the design.

   iii. The project engineer shall assume full responsibility of the VRF system design and assure the accordance with the specification standards.

   iv. VRF system shall be equipped with a heat recovery system that allows the building to cool and heat simultaneously. The VRF system must be designed with isolation valves to allow servicing without shutting down the entire system. For additional information, refer to Volume 2 Specifications.

   v. The VRF manufacture must be compatible with the Building Automation System (BAS) and allow the BAS to read all VRF points and alarms. Alarm codes on the BAS must display the manufacture error codes. Supply air temperature for the fan coils must be displayed in the BAS. For a list of all points and trend values to be included, see

Master Specification 23 0900 Instrumentation and Control for HVAC-Building Automation System.

vi. Comply with the latest code in ASHRAE Standards 15 and 34 for the maximum refrigerant per loop.

e. Dedicated Outside Air System (DOAS)

i. DOAS system shall be considered on projects where the HVAC system utilizes a dedicated outdoor air system to condition, temper and filter outdoor air separate from a local or central space-conditioning system.

ii. The DOAS supply air shall be delivered directly to the occupied space or downstream of the terminal heating or cooling coils.

iii. For a DOAS unit providing outdoor air to another space- conditioning system, the full design supply fan airflow rate shall be the total airflow of only the DOAS unit.

iv. DOAS units with airflow rate > 1,000 cfm must meet demand ventilation control requirements.

v. DOAS unit fan systems shall have the ability to modulate fan speed, primarily for balancing and reducing operation fan power.

vi. The DOAS must have the capability of ramping up fan speed to meet demand-controlled ventilation requirements based on CO2 values.

vii. Air-side economizers shall be provided for each system as required by code.

viii. Fans shall be direct drive whenever possible if VFD controlled and utilized on exhaust fans below 1000 cfm. When belt drive (non-VFD controlled) fans are required or preferred, adjustable sheaves shall be provided and criteria in project specifications requiring a sheave change to be assumed for balancing purposes.

I. HVAC System Application

1. 'Passive' HVAC shall be utilized whenever life cycle cost effective and can meet all the thermal comfort, acoustical and air quality criteria. This includes natural ventilation for cooling and to meet minimum outdoor air requirements.

2. General Classrooms: One zone per classroom. Minimum of two supply grilles and minimum one return per classroom. Overhead exposed distribution is not acceptable. Designers shall consider incorporating thermal displacement style distribution with a minimum of two drops for a typical 900 square foot classroom. Particular attention shall be taken in placing inlets and outlets for optimum distribution.

3. Science Classroom: Same as general classrooms except supply air shall be 100% exhausted in biology or chemistry rooms. Return air shall be used where possible in

non-odorous science classrooms. If room incorporates chemical hoods or utilizes hazardous materials, careful consideration shall be given to air flow patterns within room to avoid re-entrainment of hazardous fumes and or eddies near fume hoods. Hoods shall be incorporated with appropriate, end-of-run exhaust fans with suitable discharges.

4. Arts and Crafts Classroom: Similar to science classrooms except where kilns are used, they shall be provided with special kiln ventilation systems as recommended by the kiln manufacturer.

5. Kitchens shall be air conditioned and provided with appropriate ventilation and make up for cooking range hoods and dishwashing areas. Ideally, refrigeration condensers for coolers and freezers shall be located outside.

6. Gymnasiums and locker rooms shall be heated and ventilated only. Shower areas shall be exhausted.

7. Corridors and maintenance rooms shall be heated and ventilated only.

8. Restrooms and custodian closets shall be ventilated only.

9. Storage rooms shall be unventilated unless requested otherwise by the District.

10. Career technical education spaces (CTE) such as shops for auto and wood shall be heated and ventilated only, with a preference toward radiant heating, or space heating that is switched to shut off when the roll-up door is opened. Source capture exhaust systems, appropriate for the use, shall be provided as required (e.g. sawdust collection). Provide electrostatic room filtration unit(s) for these spaces to reduce dust accumulation. The CTE spaces associated with culinary, engineering, health/medical and forensics shall generally be treated similar to classrooms, with specialty exhaust as required for the specific application.

11. IT/MDF/IDF, electrical rooms with transformers and other spaces with 24 hour loads shall be conditioned with self-contained, independent systems.

12. Provide building pressure relief in spaces that are pressurized due to minimum outside air introduction or due to economizer outside air introduction. Adequate relief shall be provided so that ADA Door Closure Requirements are met in all rooms. Relief is to be provided by specifying HVAC units with accessory modulating power exhaust systems that are controlled by room static pressure or if acceptable to the District, gravity relief may be provided within individual zones.

J. Distribution Criteria

1. Air Distribution:

a. Coordinate locations of required access doors with architectural reflected ceiling plans and show accordingly.

b. Utilize remote damper controls in areas where access is difficult for manual adjustment. Please indicate and coordinate location(s) with architectural.

c. Duct systems shall be designed according to ASHRAE and SMACNA standards, and per applicable codes. Duct systems shall be designed for quiet

and efficient system operation.

d. All ductwork is to be sealed after fabrication and until in service per CHPS requirements.

e. Ductwork sall be insulated to meet or exceed applicable codes.

f. Return air shall be ducted.

g. Exterior ductwork is prohibited unless specifically approved by the District.

h. Round ductwork is preferred, space permitting. Ductwork is preferred to be concealed, but exposed ducts may be used if they don't interfere with sightlines, lighting, nor sprinklers.

i. Existing ductwork reused for new systems shall be cleaned and sealed to standards equivalent to new ductwork.

j. Flexible ductwork may be used for the last 6 feet of a distribution run to connect ceiling inlets and outlets in suspended ceilings.

k. Velocity of ductwork shall be limited to the recommendations of SMACNA and not to exceed California Mechanical Code to meet any acoustical criteria for the spaces served. Generally duct shall be sized via the equal friction method, for low-pressure, low-velocity applications. Refer to the most recent version of the ASHRAE Duct Systems Design Guide for duct velocity limitations using the equal friction method. Avoidance of excessive friction in the distribution system is an important consideration for long term energy savings and thus careful consideration of the number and type of fitting and the duct velocity to minimize friction loss is expected.

l. Low air velocity should be applied at acoustically sensitive rooms.

m. Screens / mesh will be required at all exterior vents or louver locations.

2. Hydronic:

a. Design hydronic system to be able to by-pass and provide isolation valves of major areas, at building entrances, or at mains on branch lines to buildings, at inlet and outlet of each piece of equipment, on branches within buildings serving more than one piece of equipment, for shutoff of mains on equipment drains and on each strainer. Extend drains to an indirect waste receptor unless otherwise directed. Ball type valves are required for drains and vents. Valves shall be accessible to maintenance and replacement.

b. Use the minimum number of elbow and fittings to minimize the distribution losses.

c. Pipe sizing shall use latest C values for open systems and C values for closed systems in accordance with Cameron Hydraulic Data Book or equivalent.

d. Size heating water and chilled water pipe sizing within the building for:

i. Friction loss 1.0 to 3.0-feet H2O per 100-feet.

ii. Minimum pipe size 3/4 inch, except for gage or control piping.

iii. Maximum velocity 8 fps for 2½-inch pipe size and larger.

iv. Maximum pressure drop 4-feet per 100-feet for any pipe size.

v. Minimum velocity 2 fps (except for terminal reheat runouts).

e. Chilled water coils shall be designed to perform with a 20°F temperature rise with a chilled water supply temperature of 42°F. Chilled water coils shall be sized for a maximum face velocity of 400 fpm, a minimum of 8 rows, 10 fins per inch maximum. Coils shall have aluminum fins and copper tubes and type 316 stainless steel casing and condensate pans except in coastal applications where copper or coated aluminum fins shall be incorporated. Two-way single seated control valves must be used for control at building chilled water coils; automatic flow limiting valves are required. Pressure gauges and thermometer on the inlet and outlet of the coil are required. High turn-down ratio valves are preferred.

f. Reheat coils shall be designed to perform with a minimum 40 degrees F temperature delta at a design supply temperature of 180 degrees F. The reheat coils shall be sized for a maximum face velocity of 600 fpm and a minimum of 1-row, 6-fins per inch maximum.

g. At end of long runs or major branches serving multiple coils, provide a controllable bypass valve or three way on last coil to enable enough flow to keep line at appropriate temperature.

K. Equipment Section/Sizing Criteria

1. Packaged and unitary HVAC units, indoor and outdoor, shall have an efficiency rating of at least 15 percent higher than that required by Title 24. When equipment is available with energy efficiency higher ratings, such equipment shall be specified, provided there are enough manufacturers who can meet the higher efficiency requirement to ensure a non-proprietary competitive bid.

2. High efficiency type motors shall be specified for HVAC equipment and exhaust fans.

3. Air Handling Systems:

a. Size to accommodate peak calculated block load for spaces served and add 5% additional capacity for safety and 5% for leakage.

b. Cooling Coils shall be sized for no more than 400 feet per minute face velocity and heating coils for 600 feet per minute.

c. Maximum size for a single air handling unit is 30,000 cfm unless otherwise approved by the District.

d. Plenum fans and airfoil or backward inclined wheels are preferred over forward curved. Select for maximum efficiency. Variable speed motor controllers shall be used when applied on variable air flow systems. Discharge dampers shall not be used.

4. Hydronic Systems:

a. When incorporating boilers or chillers, multiple units shall be incorporated, with the total capacity of all units shall be equal to or greater than 125% of the peak load. Sizing shall respect minimum loads as well as peak conditions.

b. Chillers:

i. Size on peak, block load of spaces served and include additional 10% for safety factor and minor growth.

ii. Select evaporators for maximum pressure loss of 10 feet H2O or less.

iii. Select air cooled chillers at typical maximum expected ambient at location where chiller is mounted. (e.g. add several degrees for roof locations or if in enclosure with limited air circulation).

iv. Select cooling towers for water cooled chillers at typical maximum expected wet bulb temperature for location where chiller is mounted (minimum 1 degree above 0.4% wet bulb). Cooling towers shall be selected for minimum 8 degree approach temperature.

c. Boilers:

i. Size for peak building load, including 25% additional for pick-up (warm up).

ii. Select for maximum water temperature difference suitable for distribution efficiency, matching existing coil selections as applicable and type of boiler selected.

iii. When selecting boilers, confirm regional air quality management district rules and regulations relative to NOx and other emission levels.

iv. If boilers require higher that standard pressure gas, confirm with utility company availability and acceptability to District.

d. Distribution:

i. Variable flow chilled water and hot water is required. Chilled water flow rates for all new systems shall be based on a minimum of 16 degree temperature difference, however 20 degrees or more should be considered. Where tying to existing coils that have lower temperature differences, match to existing unless the District directs the replacement of the existing coils. Hot water temperature difference shall be 40 degrees unless analysis shows an alternative that is more life cycle cost effective or more suitable for application.

ii. Pumps: Pumps shall be selected for the maximum efficiency point if constant volume and shall be non-overloading throughout the curve. When selecting parallel pumps, use applicable curves for parallel

pumping. Unless systems are small, preference is for three pumps of 50% each or two at 62.5% each. Single pump applications may only be done when approved by the District.

a) Close coupled pumps shall not be used unless approved by the District.

b) Match pump to application for space, flow and head restrictions. Flexibly coupled, base mounted, pumps are preferred to vertical in-line. When flows are in excess of 500 gpm, consideration shall be given to split case designs.

c) Pumps over 5 horsepower shall be equipped with variable speed motor controllers. For pumps less than 5 horsepower, consideration should be given to ECM motors if available.

L. HVAC Controls

1. The building automation/energy management system shall be compatible with the existing District wide energy management system. Refer to Volume 2 Master Specifications. The building controllers shall integrate with central utilities control systems. The system shall be able to integrate multiple building functions, including equipment supervision and control, alarm management, energy management, historical data management and archiving.

2. Control panels shall be stand-alone in memory, networking, and control operations. The design of the controls shall be in a modular format, permitting future expansion capabilities. The system shall monitor and control equipment according to the sequence of operation, as well as additional input and output points. The building control system shall operate to ensure operational safety, regulatory compliance and to satisfy process constraints as well as occupant comfort.

3. HVAC unit operating schedules shall be controlled by an Energy Management System (EMS). Determine if campus already has an EMS system and if so, coordinate adding the new building(s) to the existing system. If no EMS system exists, then provide a new campus-wide control system for remote communications to control the HVAC systems.

4. If embedded controls on equipment furnished under this contract are utilized as part of the control sequence, designers shall ensure compatibility between the District's EMS and site-specific control system and the equipment. The equipment controller must allow EMS to control all points and alarms specified in the Building Automation System, Refer to Volume 2, Master Specification 23 0900 Instrumentation and Control for HVAC-Building Automation System

5. The thermostats shall allow the user to adjust the room heating and cooling set points between 66 to 70 degrees for heating and between 72 to 76 degrees for cooling. The thermostat shall have the capability of a dual set point with an adjustable deadband.

6. For large occupancy spaces (e.g., auditorium) multiple sensors will be installed and utilized to obtain an average space temperature.

M. Sequence of Operations for Air Conditioning Systems

1. Design professional shall provide a wiring diagram in the drawings indicating the

required sequence of operations.

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V. Plumbing Requirements for Construction Projects

A. General Requirements

1. The Plumbing systems shall comply with the current California Code of Regulations, Title 24, Title 19 and Title 8 as well as the standards of ASPE and NFPA and the requirements of local authorities having jurisdiction including but not limited to the county health department for kitchens, City and County Pollution Control District and Fire Departments for Hazardous materials storage and distribution. Comply with the other provisions of the Long Beach USD Facility Design Standards.

2. Plumbing System Components shall comply with California Assembly Bill 1953 (effective January 1, 2010), which limits the allowable lead content in certain potable water system components.

3. Design systems to be durable, easy to service and energy efficient. Should the choice exist between multiple alternatives that all generally achieve the same goals of quality, duty and cost to operate and maintain, the decision shall be made on the basis of a 20-year life cycle cost analysis.

4. Refer to Volume 2 for the outline specifications for products, materials and installation standards.

5. All projects to comply with CHPS requirements. Refer to the Volume 1 Appendix for the sample CHPS score card, and Collaborative for High Performance Schools "Best Practices Manual" (available at http://www.chps.net) for additional criteria, and.

6. Assure accessibility provisions for servicing and replacement.

   a. Where practical, all equipment shall be housed within interior equipment spaces within buildings.

   b. Roof mounted equipment is discouraged unless no other alternatives are available and may only be done with the approval of the District. Fixed ladders and roof hatches shall be incorporated in projects where regular access to the roof is required for servicing equipment. Comply with Cal OSHA requirements.

   c. Provide adequate working space around equipment for servicing. Coordinate with architectural drawings for required clearance striping.

   d. If components requiring regular service are above ceiling, they shall be accessible from the floor via portable ladder through access doors or removable ceiling tiles of adequate size to accommodate servicing requirements.

B. Plumbing System Commissioning

1. Coordinate project specific commissioning requirements with the designated District representative and the District's commissioning consultant as required for CHPS requirements.

2. Refer to Volume 2 for requirement to specify the coordinated commissioning

requirements before the District will accept the project as complete. This includes air balancing and submission of balance reports, acoustical measurements and submission of acoustical reports for noise sensitive areas, final calibration and set points for control systems and components, and training of the District's Maintenance and Operations staff for operating and maintaining the systems prior to occupancy. Also require re-balancing, review of equipment performance and submission of findings on a report to the District prior to expiration of warranty. Require a review on site and re-training for maintenance department prior to the end of the warranty period.

3. See outline specifications for requirement to specify commissioning before the District will accept the project as complete. This includes training of the District's Maintenance and Operations staff for operating and maintaining the systems prior to occupancy.

C. Design Coordination with District

1. Prior to starting design, the Design Professional shall meet with the District's Facilities Planning and Maintenance and Operations Departments and review existing site specific plumbing conditions, problems or issues if applicable as well as issues of general concern within the district to avoid repeating problems being experienced on other sites or past projects.

2. The Design Professional is to review scope statement and propose additional scope that may be determined necessary with designated District representative and the Maintenance and Operations Department prior to starting design.

3. The Design Professional is to meet with designated District representative to help develop phasing schedule and coordinate system design for construction phasing requirements. The goal is to minimize impact to school operations and allow for functioning systems during construction.

4. For renovations, the Design Professional is to review plumbing as-built drawings, conduct independent site investigations and evaluate existing conditions. Incorporate findings into the Field Report due at the end of the Schematic Design phase and update as necessary in subsequent submittals.

5. Following the initial investigations and consultations with the District, the proposed approach for plumbing shall be presented to the District in a narrative form with catalogue cuts and any drawings or diagrams to amplify or explain approach. This should be done as early as practical, preferably in the concept stage. Design shall not proceed until the approach and concept design is reviewed and accepted by the District.

D. Site Utilities

1. Contact utility providers to determine the site-specific requirements, confirm availability of desired pressure and flow rates and make a recommendation to the District for the most cost-effective service connection.

2. Specify a seismic gas shutoff valve on the consumer side of the gas meter within the secure utility yard.

3. Gas meters shall be enclosed in the utility yard that meets the utility company's requirements. Locations shall be approved by both the District and the Utility Company.

4. Site gas distribution piping shall be medium pressure (5 PSIG) where available, and

regulated down to low pressure (12-inch W.C.) at each building. Specify code-required accessible gas shutoff valve outside each building served. Building shutoff valves and regulators shall be accessible for service but located to prevent vandalism.

5. Size site utilities to allow for potential future campus expansions. Coordinate with master plan requirements.

6. Coordinate fire hydrant locations with the local fire jurisdiction.

7. Confirm the existence of utilities within the project area. At heavily congested locations, critical routing and or points of connection, locating services may be desired in addition to pot-holing in strategic locations. Discuss recommendations of these additional measures with District if the potential exists for interferences that could cause major cost or disruption.

8. Design site water system to by-pass and provide isolation valves of major areas, at building entrances, or at mains on branch lines to buildings. Valves shall be accessible for maintenance and replacement.

9. Tracer wires shall be provided for all non-metallic underground piping systems.

E. Building Plumbing Systems

1. The project shall be provided with complete interior plumbing systems, connected to site services complying with the requirements of the California Plumbing Code. This may include but is not limited to, domestic cold water, domestic hot water, sanitary soil, waste and vent, acid waste and vent, grease waste and grease vent, storm drain, condensate, fuel gas systems and compressed air as needed for the scope of the project.

2. Distribution:

   a. Water:

      i. Provide water service to all fixtures and outlets that require supply. Design distribution to enable 25 psi to be maintained at furthest flush valve; provide booster systems as required.

      ii. Size piping based on the number of fixture units and demand load curves in the California Plumbing Code (CPC).

      iii. Provide water hammer arrestors for portions of system that may be subject to water hammer, such as for quick closing valves.

      iv. Maximum water velocity shall be 5 feet per second for pipes 2 inches and smaller and 7 feet per second for piping 2 ½ inches and larger

      v. In noise sensitive spaces, the use of Trisolators or similar isolation at support points may be required; consult acoustical engineer.

      vi. Minimum pipe size serving any flush valve shall be 1 ¼ inch. May be reduced in wall cavity to flush valve connection size,
      e.g. 1-inch, prior to penetrating wall.

      vii. Design cold water system with shut off valves to enable isolation of distinct areas of the building, such as at each floor and each restroom. Provide at each piece of equipment (e.g. water heater). Valves shall be accessible to maintenance and replacement.

3. Waste and Vent

   a. General:

      i. The use of low-flow fixtures affects the slope required for waste lines. Waste lines shall be designed with slopes to exceed code required minimums at low-flow fixtures whenever possible. The Design Professional is to determine the slope necessary for complete flushing of the waste lines.

      ii. Cleanouts shall be provided above all urinals, under sinks and lavatories, except at Classrooms sinks-cleanouts shall be provided above sinks, and elsewhere required by code. Exterior cleanouts shall be installed in yard boxes or in walkways, flush with surface. Interior cleanouts shall be arranged to avoid finished public or student areas and if unavoidable, shall be fit with suitable top and located to be as unobtrusive as possible, yet functional for its intended use.

      iii. Lift stations shall be provided with two pumps for maintenance and in case of failure.

      iv. In addition to the chemical waste and grease waste below, other waste streams may be subject to regulatory oversight and may require pre-treatment such as auto shop drains, film processing drains and other applications using and potentially discharging regulated chemicals or substances.

      v. Interceptors shall be located so they may be effectively inspected and cleaned. Interceptors shall be separately vented.

   b. Chemical Waste and Vent:

      i. Consult with local department of public works relative to waste disposal requirements for chemical waste. Provide neutralization system if required and or sampling box. Design Professionals are to confirm the requirements with the local jurisdiction.

      ii. Chemical waste and vent system shall be independent of other waste and vent systems.

   c. Grease Waste

      i. Consult with local department of public works relative to waste disposal requirements for grease waste. Provide trap of size as required to meet demand and local requirements of jurisdiction. Health department approval may be required.

4. Storm Drain

   a. Storm drain systems shall be piped to underground. Provide roof drains and overflow drains as required by code, compatible with roof system.

   b. Design for a minimum of 3-inches per hour rainfall.

   c. Insulate rainwater leaders and bodies of roof drains in areas subject to

condensation.

5. Fuel Gas:
   a. Avoid lengthy horizontal roof mounted piping. Paint exterior piping.
   b. Provide shut-off valve, building/area isolation valves, union and dirt leg on all gas connections to appliances.
   c. Provide accessible shut off valves for each gas outlet or groups of outlets with a room (master shut-off valve for science classrooms).
   d. All valves shall be protected from public or student tampering.
   e. Regulators if required in addition to appliance regulators furnished with gas fired equipment, shall be located in secure locations and vented to exterior when located inside buildings.
6. Compressed Air:
   a. If required for curriculum or for staff use, verify demand and pressure requirements with users.
   b. Compressors shall be duplex, tank mounted and located within secure mechanical spaces whenever possible. Provide dryer and filters. Contractor shall be responsible for all operating permits.
   c. Piping shall be sloped to facilitate drainage and shall be provided with end use connectors needed for required function.
   d. Automated drain valve required on compressor.
7. Water Heating:
   a. Provide tempered water in the following locations:
      i. Employee rooms with sinks or lavatories
      ii. Special education classroom sinks
      iii. Staff and public toilets
      iv. Showers including emergency showers
      v. Aquatic Center sinks
      vi. Kitchen handwash stations
      vii. Kindergarten sinks where food may be served in the classrooms
      viii. Science classroom sinks or as otherwise required for curriculum
      ix. Art classroom sinks
      x. Shop sinks

   b. Provide hot water in the following locations:

i. Custodial sinks

ii. Mop sinks

iii. Washrooms serving food service areas

iv. Kitchens

v. Nurses' office and restroom

c. Hot water heaters shall be located as close to the point of use as possible and set at temperatures to minimize bacterial growth. Provide tempering valves as required to limit discharge at student and public uses to 120 degrees maximum.

d. Domestic hot water temperatures shall be 120 degrees F storage at the tank and 110 degrees F delivery from the fixture. Hot water for kitchens shall be 140 degrees F, and for commercial kitchen dishwashers shall be 160-180 degrees F, or as required by the dishwasher manufacturer. Delivery temperature of hot water will be controlled by mixing valve.

e. High efficiency water heaters including solar thermal and heat pump water heaters should be evaluated as part of the overall sustainable strategy and CHPS goals. Instantaneous water heating shall only be used with approval from District.

f. Locker and shower room water heating system shall be of the separate water heater and storage tank type with hot water recirculation system and thermal expansion tank, and shall be dedicated for shower areas.

g. Water heaters in Kitchens shall have a minimum 75 gallon tank.

h. Water heater must be sized to fit through a three-foot doorway.

i. Water heaters shall be certified by the California Energy Commission and meet the requirements of Title 24, and if gas fired, the requirements of the South Coast Air Quality Management District Rules 1121 and 1146.2.

j. Provide a water temperature maintenance system or other strategy designed to eliminate wait times for hot water, which contributes to water conservation efforts. A recirculation system with pump and aquastat is required.

F. Fixtures

1. Refer to Volume 2 Specifications for specific fixture requirements

2. Fixtures must comply with State water conservation guidelines and efficiency standards in effect.

3. Comply with California and Federal accessibility standards and lead-free standards.

4. Provide IPS inlet angle stops (loose-key, lockshield) and one-piece, chrome plated copper supply tubing with metal nose end for water supplies to faucets. Braided or flexible supply lines are not allowed. Inlets to flush valves shall be threaded brass piping with either chrome plating on exposed sections or chrome plated metal sleeve and escutcheons to cover.

5. P-traps shall be L.A. pattern cast brass with galvanized nipple trap arm and chromium plated brass casing.
   a. ADA trap and supply covers shall be provided where required.
   b. Incorporate water hammer arrestors where quick closing valves are incorporated such as flush valves.
6. Water Closets:
   a. Water closets shall be high efficiency (HET) type with compatible, manual flush valve. Wall mounted, vitreous china with siphon jet action and elongated bowl with open front seat, in both ADA and non- ADA compliant configurations as applicable.
   b. Provide accessible floor mounted water closets in early education classrooms including kindergarten restrooms. Water closets shall be sized for students ages 3-4. Provide rough-in waste at 12 inches and flush valve at 15 inches to allow for standard accessible height water closet, if room function changes.
7. Urinals:
   a. Urinals shall be high efficiency (HEU) type with compatible manual flush valve. Wall mounted, vitreous china with wash down action, in both accessible and non-accessible configurations.
8. Lavatories:
   a. General student restroom lavatories shall be wall mount enameled cast iron with push button metering faucet and floor supported concealed arm brackets.
   b. Food Service restroom lavatories and hand wash sinks within food service spaces shall be provided where required to meet health department requirements.
   c. Multiple-user Staff restroom lavatories shall be self- rimming enameled cast iron with lever handle mixing faucet.
   d. Single-user Staff restroom lavatories shall be wall mount enameled cast iron with lever handle mixing faucet and floor supported concealed arm brackets.
9. Sinks:
   a. Sinks shall be enameled cast iron drop-in type unless noted otherwise.
   b. Student sinks shall have lever handle, gooseneck faucets.
   c. Staff counter sinks shall be accessible, low flow, single bowl, with lever handle mixing faucet and swing spout or gooseneck faucet.
   d. Kitchen, Break Room or pantry sinks shall be accessible, low flow, single bowl, with lever handle mixing faucet, and spray. Provide a 3/4 horse-power garbage disposal at Break Room and pantry sinks. Provide a scrap collector at Kitchen sinks; refer to Volume 2 Master Specification: 11 40 00 Food Service Equipment for more information.

e. Sinks used for special programs such as art and ceramics, agricultural and other uses that may involve large particulates, shall be equipped with solids interceptors. Hair traps shall be provided in sinks used for programs involving hair cutting or styling. Special purpose sinks may be stainless steel as they are available in more sizes and configurations.

f. Science room sinks shall be under-counter, low flow, corrosion resistant resin type.

i. Staff science room sinks shall be accessible single bowl, with serrated hose nozzle gooseneck faucet and integral vacuum breaker.

ii. Student science room sinks shall be accessible, single bowl cold water, with serrated hose nozzle gooseneck faucet and integral vacuum breaker.

g. Service Sinks shall be corner floor mount enameled cast iron or terrazzo type, with lever handle faucet with integral stops, low flow, and vacuum breaker, pail hook, hose and vinyl rim guard.

10. Emergency Fixtures:

a. Where required to meet the intent of the code (CCR, Title 8, Section 5162), and elsewhere as directed by the District, provide emergency combination drench showers and eyewash stations. Provide drainage as required to reduce water damage on accidental discharge and alarm actuated from flow switch to tie to EMS system or local alarm as directed by District. Prove tempering system as required to meet ANSI standards.

11. Miscellaneous Fixtures:

a. Gas turrets shall be provided adjacent to student and staff science sinks and shall have a check valve and vandal resistant anchor.

b. Science room gas outlets shall be controlled via a remote solenoid valve located above ceiling at gas point of entry to classroom. A control station shall be provided at the teacher's demonstration table to allow emergency shut off and lockout of the remote solenoid valve. The control station is to remain visible and not hidden in demonstration table cabinets. The valve shall be normally closed.

c. Refrigerator icemaker locations shall be provided with wall mount recessed box type cold water supplies.

d. Clothes washer locations shall be provided with wall mount recess box type supply and drain with integral water hammer arrestors.

e. Coordinate dryer vents for dryer locations. Dryer vents through the wall are preferred; under extreme circumstances roof penetrating vents may be considered with a Variance Request. Screens or mesh will be required at all vent locations.

f. Interior Hose Bibs shall be standard wall flange type with loose key operation.

i. Locations:

a) Multiple-user Restrooms: under lavatory, one per restroom. Chrome plated.

b) Locker Rooms: accessible for use throughout entire locker area.

g. Custodial Rooms: above service sink to accommodate cleaning product dispenser system.

h. Exterior hose bibs shall be recessed lockable box type with integral vacuum breaker. Hose bibs shall be located not more than 100 feet apart.

i. Exterior rooftop hose bibs shall be loose key free-standing type with rough chrome finish and integral vacuum breaker. Provide adjacent to mechanical cooling equipment, not to exceed 50-foot radius.

12. Floor Drains:

a. General purpose floor drains shall be square strainer type for tiled areas, round strainer type for poured surface areas, with trap seal primer connections.

b. Shower floor drains shall be square strainer type for tiled areas, round strainer type for poured surface areas.

c. Emergency drench shower or eyewash floor drains shall be square strainer type for tiled areas, round strainer type for poured surface areas, minimum 4-inch outlet size with trap seal primer connections.

d. Floor drains not receiving regular discharge from a plumbing fixture, or as otherwise required by code, shall be provided with an automatic trap priming system.

e. Provide floor drains in all new restrooms, custodial closets, mechanical rooms, shower rooms, laundry areas, and adjacent non- carpeted drying areas. Where more than more than 4 water closets or urinals are provided, two drains shall be used. Where floor drains are not present in existing restrooms, custodial closets, mechanical rooms, shower rooms, laundry areas, and adjacent non-carpeted drying areas, floor drains shall not be added unless required by applicable codes.

13. Floor Sinks:

a. Floor sinks used for condensate shall be 3/4 grate type or as appropriate to accommodate service line(s), with trap seal primer connection and 2-inch minimum outlet.

b. Floor sinks used for the Kitchen 3-compartment sink shall be 3/4 grate type, and with 3-inch outlet.

c. Floor drains not receiving regular discharge from a plumbing fixture, or as

otherwise required by code shall be provided with an automatic trap priming system.

14. Showers:
    a. Student showers shall be recessed mount, thermostatic mixing valve actuation, accessible.
    b. Staff showers shall be recessed mount, thermostatic mixing valve actuation, accessible.
15. Drinking Fountains and Bottle Filling Stations:
    a. Drinking fountains shall be dual height 14-gauge stainless steel non-refrigerated type
    b. Drinking fountains and bottle filling stations to be vandal resistant Coordinate drinking fountain and bottle filling stations based on school type, number of buildings, number of floors, and available space for dual height (renovation). Also consider needs for athletics and play yards.
    c. All drinking fountains and bottle filling stations to be fully mechanical with no electrical requirements.
    d. Drinking fountain and bottle filling station water to have filtration system. Filtration may be either ahead of fixture or within fixture that is easily accessible for maintenance
    e. Provide isolation shut-off valve(s) for maintenance and repairs.
    f. Provide water hammer arrestors at drinking fountains.
    g. Provide access panel for servicing.Access panel for isolation shut-off and for filtration if filters are not contained with fixture.
    h. Integrated bottle filling stations to be provided for Elementary, K-8, Middle, and High schools. Provide at minimum:
        i. one (1) near playground or athletic fields,
        ii. one (1) near or inside of cafeteria, and
        iii. one (1) per floor per permanent building.
        iv. i. Do not provide drinking fountains at Gymnasium floor areas.

G. HVAC System Plumbing Connections

1. Provide gas shut-off cock at each gas fed unit.
2. Provide condensate trap at each mechanical cooling unit, as required by manufacturer's recommended installation requirements. Condensate piping shall discharge to a roof receptor, floor sink, or service sinks with an air gap termination (no indirect waste trap connections).
3. Condensate shall be drained by gravity. If gravity drain cannot be met, submit Variance Request. Evaporation drip pans are prohibited.

4. Overflow condensate shall terminate through ceiling with a polished chrome escutcheon centered above a sink or other fixture such that an overflow condition will not cause damage to floors or other surfaces.
5. Provide backflow preventer at each makeup water connection.
6. Interior, RP backflow preventers shall be equipped with indirect drain piped to nearest floor drain or floor sink.

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V. Fire Protection Requirements for Construction Projects

A. Sprinkler Heads:

1. Concealed with covers at finished ceilings, provide white covers.
2. At exposed open ceilings provide upward or downward heads as best to accommodate requirements.

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VI. Electrical Requirements for Construction Projects

A. Campus Site Service

1. Design Professional to confirm if the existing electrical service is adequate to service the proposed new building(s). Incorporate findings into the Field Report due at the end of the Schematic Design phase and update as necessary in subsequent submittals. If upgraded service is required, the following items apply:

   a. Site primary service design and location must be coordinated with and approved by the local utility company. Design Professional is required to obtain written approval from the utility provider, incorporate requirements into the bid documents, and confirm availability of design voltage and phase.

   b. The Design Professional is to obtain approval of electrical service location from the designated District Representative prior to final system design. Service conductors shall be routed to avoid pathway and common areas.

   c. Locate switchgear and transformer away from classroom areas in a fully secure utility yard with concrete housekeeping pad. Coordinate the location with the existing service to minimize down-time at switch over. Obtain approval of proposed location prior to proceeding with construction documents.

   d. Specify a minimum of a 2,000 Amp service. Increase size of service if necessary to accommodate design loads plus future loads of master planned additions or for the addition of 12 portable classrooms if no additions are planned.

   e. All primary feeds to have a red concrete slurry cap. Coordinate specific requirement with Southern California Edison.

2. Design Professional to confirm if the existing phone, data, and cable service is adequate to service the proposed new building(s). Incorporate findings into the Field Report due at the end of the Schematic Design phase and update as necessary in subsequent submittals. If upgraded service is required, the following items apply:

   a. Site primary service design and location must be coordinated with and approved by District Technology Representative. Design Professional is required to coordinate with utility provider, walk the site with the utility provider and incorporate requirements of pathway from local feed to major point of entry at the MDF Room.

   b. The Design Professional is to obtain a quote from the local utility provider for the cost of work associated with new utility service. Coordinate with District Technology Representative.

   c. Coordinate specific requirements with local provider.

3. Vandal resistant, locking lids at all underground electrical boxes will be OFCI for District access. Coordinate with District Representative and District Maintenance department.

B. Electrical Distribution

1. Underground electrical conduits shall be concrete encased to 3 inches above conduit. Backfill with native soil and provide red metallic warning tape 12- inches below grade, per District preference on trenching, refer also to Civil – Site Design Standards.
2. Electrical duct-banks shall be installed with spacer racks to provide 3-inch separation of conduits.
3. Step-down transformers to be located at individual buildings for 480/277 volts or higher distribution systems. The Design Professional is to recommend energy efficient transformers. Transformers and feeder conductors shall be located away from classroom areas.
4. Include spare conduits with pull ropes in conduit duct banks. The number, size and termination points of the spare conduits need to be determined specifically for each campus layout. The Design Professional is to meet with the designated District Representative prior to finalizing the DSA submittal set to determine the specifics.
5. All spare conduit to be capped / plugged.
6. Surface mounted raceway is not permitted without permission of the District. Conceal cable sleeves and pathway in wall whenever possible.
7. Limit the use of flex conduit. If flex conduit must be used, limit the length to six feet in concealed spaces such as walls.
8. Specify necessary conduits to service future campus additions.
9. Locate panels in dedicated electrical closets. Specify surface-mounted panels with skirts.
10. Specify copper for transformers, switchboards and panel boards.
11. Design electrical circuits to service no more than five, non-computer, duplex receptacles on one circuit. Circuits servicing computers shall be limited to no more than three duplex receptacles.
12. Main Distribution Frames (MDFs) and Intermediate Distribution Frames (IDFs) require a dedicated circuit at each rack and wall mounted head end equipment enclosure. Where an Uninterruptible Power Supply (UPS) is required, provide an additional dedicated circuit for each UPS system sized per system Confirm equipment requirements to appropriately size power distribution including outlet type.
13. Specify dedicated power to fire alarm system, telecommunication system, copiers, digital video surveillance system, intrusion detection system, intercom clock system and other specialty equipment.

C. Power Receptacles

1. Floor mounted receptacles are not allowed except in carpeted, non-student areas listed in Specific Room Requirements such as under conference room tables, on stages, and gymnasiums.
2. Computer receptacles are to be identified and to have isolated ground. No shared neutrals are permitted for computer receptacles.
3. Shared neutrals are permitted for non-computer receptacles up to 60 percent of capacity.
4. In restrooms, provide 20 amp, GFI service receptacle by the door at 1 foot 6 inches

above finish floor with locking cover and water seal to service cleaning equipment.

5. In areas designated for vending machines, provide receptacle at six feet (6') above finished floor.
6. Coordinate location and receptacle requirements for production copiers.
7. Provide power receptacles adjacent to all data outlets.
8. Provide an electrical receptacle below all light switches near the main entry door.
9. Provide power receptacles above all casework countertops, minimum one duplex receptacle per counter. Provide power with GFCI receptacles at countertops with sinks.
10. Provide an electrical receptacle for Maintenance to plug in their mobile trailer. Refer to standard detail "DIV 26 – Maintenance Trailer Power". Coordinate requirements for location of trailer with Specific Site Requirements.
11. Provide power with GFCI receptacles at the field and batting cage.
12. At auditoriums, lecture halls, or performing arts centers with fixed seating, provide power and data service package incorporated into seat if required.

D. Emergency Generator

1. Emergency generators are required at all sites. Load banks at 75% minimum capacity. Receptacles on emergency circuits are to be red in color. In case of power failure, the generators shall maintain power to the following items:
   a. Emergency egress lighting.
   b. Minimal Administrative office lighting.
   c. Main Distribution Frame (MDF).
   d. Telephone head-end equipment.
   e. Fire alarm panel.
   f. Intercom Clock and Bell Systems
   g. Security systems
   h. Nurses' Room power receptacles (for life-saving medical equipment and refrigerator).
   i. Air conditioning systems required to maintain the equipment listed above.
2. The Contractor will obtain a permit to "Operate and Construct." The District will assist with the process.
3. Specify that a factory-authorized service representative trains Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators.

E. Batteries

1. The use of lead acid batteries should be minimized. In no case are lead acid batteries allowed in equipment storage rooms.
2. Uninterrupted Power Supplies (UPS) must be in accessible locations allowing the UPS systems to be easily replaced.

3. Where practical, backup electricity should be tied to generator systems. The District discourages batteries on their sites.

F. Surge Protection

1. Specify integrated TVSS in the main switchgear panel to protect system from external surges.

G. Grounding

1. Specify separate ground conductors for equipment grounding in feeder and branch circuits including lighting circuits. Specify separate neutral conductor from electronic equipment. Specify grounding conductors in conduit or raceways. Use of the raceway as ground is not permitted.

2. Metallic objects on the Project site that enclose electrical conductors, or that are likely to be energized by electrical currents, shall be effectively grounded.

3. Metal equipment parts, such as enclosures, raceways, and equipment grounding conductors, and earth grounding electrodes shall be solidly joined together into a continuous electrically conductive system.

4. Metallic systems shall be effectively bonded to the main grounding electrode system.

5. A separately derived AC source shall be grounded to the equipment grounding conductor, and to separate "made" electrode of building grounding electrode system.

6. Electrical continuity to ground metal raceways and enclosures, isolated from equipment ground by installation of non-metallic conduit or fittings, shall be provided by a green insulated grounding conductor of required size within each raceway connected to isolated metallic raceways, or enclosures at each end. Building structural steel shall be part of the grounding electrode system.

7. Cold water, or other utility piping systems, shall not be utilized as grounding electrodes due to the installation of insulating couplings and non- metallic pipe in such installations. In addition to bonding to cold water pipe provide at least one of the following made grounding electrodes:

   a. A dedicated "made" electrode, fabricated of at least twenty-feet of galvanized 1/2 inch diameter rebar encased by at least 2 inches of concrete, and placed next to the bottom of a concrete foundation, or footing in direct contact with earth A welded extended portion shall surface at the location of the common grounding electrode bus bar and be extended by a 3/0 CAD welded bare copper cable, or be CAD welded directly to the bus. The CAD weld shall be at least 4 inches above finished floor in a dry location. The main grounding electrode and associated grounding conductors shall be in an enclosure and in conduit.

   b. Grounding electrodes as specified hereafter in this section.

   c. Concrete enclosed electrode, fabricated of at least twenty- feet of No. 3/0 AWG, minimum size, bare copper conductor, encased by at least 2 inches of concrete, located within or near bottom of a concrete foundation, or footing, which is in direct contact with earth. Footing rebar shall be connected to copper wire with approved connectors. An external electrode, as specified hereafter

or as required by the CEC, shall be installed and connected to foundation or footing rebar.

8. Non-current carrying metal parts of high-voltage equipment enclosures, signal and power conduits, switchboard and panel board enclosures, motor frames, equipment cabinets, and metal frames of buildings shall be permanently and effectively grounded. Provide a CEC sized grounding conductor in every raceway.

9. Metallic or semi-conducting shields and lead sheaths of cables operating at high voltage shall be permanently and effectively grounded at each splice and termination.

10. Neutral of service conductors shall be grounded as follows:

    a. Neutral shall be grounded at only one point within the Project site for that particular service. Preferable location of grounding point shall be at the service switchboard, or main switch.

    a. Equipment and conduit grounding conductors shall be bonded to that grounding point.

    b. If other buildings or structures on the Project site are served from a switchboard or panel board in another building, power supply is classified as a feeder and not as a service.

    c. Equipment grounding conductor is installed from switchboard to each individual building. At building, grounding conductor is bonded with power equipment enclosures, metal frames of building, etcetera, to "made" electrode for that building.

    d. Feeder neutrals shall be bonded at service entrance point only, neutrals of separately derived systems shall be bonded at the source only.

11. If there is a distribution transformer at a building the secondary neutral conductor shall be grounded to "made" electrode serving the building.

12. Within every building, the main switchboard or panel board shall be bonded to the cold-water line. Metallic piping systems such as gas, fire sprinkler, or other systems shall be bonded to the cold-water line.

H. Lighting

1. At a minimum, lighting shall meet Title 24 requirements for energy efficiency based on watts per square foot and comply with CHPS recommended guidelines (http://www.energy.ca.gov/title24/).

2. The maximum rated wattage or re-lamping rated wattage of a luminaire shall be listed on a permanent, preprinted, factory installed label, as specified by UL 1574, 1598, 2108 or 8750 as applicable: and

    a. The factor-installed maximum rated wattage or re- lamping rated wattage label shall not consist of peel-off or peel down layers or other methods that allow the rated wattage to be changed after the luminaire has been shipped from the manufacturer.

3. For new construction or major renovations, the indoor lighting must meet Title 24 requirements.
4. Provide District with copies of lighting calculations indicating anticipated lighting levels and watts per square foot based on Title 24. Coordinate colors of finishes with Architect for reflective values.
5. Specify LED light fixtures for all applications. The Design Professionals are to submit proposed fixtures that meet the following general requirements:
    a. Must bear the Underwriters Laboratories (UL) label or Intertek Testing Services NA, Inc. (ITSNA); formerly ETL label.
    b. Must be part of Design Lights Consortium's (DLC's) Qualified Product List (QPL) and meet most recent DLC Technical Requirements. An example can be found at https://www.designlights.org
    a. Must be readily available from major local (within 75 miles) wholesale houses.
    b. When possible and fixture design allows, the fixture must have replaceable diode banks and easily accessible drivers.
    c. Kelvin temperature to be 4000K unless otherwise specified by the district based on design criteria and application.
    d. Must be appropriately selected for intended application; custom or modified light fixtures are not acceptable.
    e. Refer to Volume 2 Specifications: 26 50 00 — Lighting for additional requirement.
6. Where possible, design suspended fixtures to allow an unobstructed swing of 45 degrees in any direction to avoid the need for seismic bracing.
7. Do not specify "tamper proof' fasteners for interior light fixtures.
8. Light fixtures shall be located in a manner that accommodates ease of maintenance.
9. Refer to Specific Room Requirements for interior lighting level requirements.
10. For interior linear lighting, the following type of fixtures shall be installed: T-Bar Grid Recessed:
    Option 1: LED Recessed Troffer
    Option 2: LED Flat Panel
11. Controls:
    a. All control devices should be in the California Energy Commission database as proof of Title 20 certification. Contractor is required to provide proof of such certification for any proposed control to be installed.
    b. Controls shall at minimum meet the newest version of Title 24 requirements for energy efficiency based on most recent criteria. Controls should be local to the zone or area and standalone unless otherwise authorized by the District. The controls should not be part of an integral BMS system. However, Title 24

controls' exceptions should be the basis of design. The following are the lighting controls' exceptions referenced recent version of Title 24 building energy efficiency standards:

c. Area Controls – Section 130.1(a)

i. Each area enclosed by ceiling-height partitions shall provide lighting controls that allow the lighting in that area to be manually turned on and off.

ii. EXCEPTION **to Section 130.1(a):** Up to 0.1 watts per square foot of lighting in any area within a building may be continuously illuminated to allow for means of egress illumination, if:

a) The area is designated for means of egress on the plans and specifications submitted to the enforcement agency under Section 10-103(a)2 of Part 1; and

b) The controls for the egress lighting are not accessible to unauthorized personnel.

iii. EXCEPTION **2 to Section 130.1(a)1:** Restrooms having two or more stalls, parking areas, stairwells, and corridors may use a manual control not accessible to unauthorized personnel

d. Multi-Level Lighting Controls – Section 130.1(b):

i. The general lighting of any enclosed area 100 square feet or larger, with a connected lighting load that exceeds **0.5 watts** per square foot shall provide multi-level lighting controls that allow the level of lighting to be adjusted up and down.

ii. **EXCEPTION to Section 130.1(b)1:** Classrooms with a connected general lighting load of 0.6 watts per square feet shall have at least one control step between 30-70 percent of full rated power.

iii. **EXCEPTION 1 to Section 130.1(b):** An area enclosed by ceiling-height partitions that has only one luminaire with no more than two lamps or has only one inseparable solid-state luminaires (SSL)

iv. EXCEPTION 2 to Section 130.1(b): Restrooms

e. Shut-OFF Controls – Section 130.1(C)

i. All installed indoor lighting shall be equipped with controls that automatically reduce lighting power when the space is unoccupied.

ii. In offices 250 square feet or smaller, multipurpose rooms of less than 1,000 square feet, classrooms of any size, conference rooms of any size, and restrooms of any size, lighting shall be controlled with occupant sensing controls to automatically shut OFF all of the lighting in 20 minutes or less after the control zone is unoccupied.

iii. **EXCEPTION 1 to Section 130.1(c)1:** Where the lighting is serving an area that is in continuous use, 24 hours per day/365 days per year.

iv. EXCEPTION **2 to Section 130.1(c)1**: Lighting complying with

Section 130.1(c)5 or 130.1(c)7.

v. **EXCEPTION 3 to Section 130.1(c)1:** Up to 0.1 watts per square foot of lighting in any area within a building may be continuously illuminated, provided that the area is designated for means of egress on the plans and specifications submitted to the enforcement agency under Section 10-103(a)2 of Part 1.

vi. EXCEPTION **4 to Section 130.1(c)1**: Electrical equipment rooms subject to Article 110.26(D) of the California Electrical Code.

vii. **EXCEPTION 5 to Section 130.1(c)1**: Illumination provided by lighting equipment that is designated for emergency lighting, connected to an emergency power source or battery supply, and is intended to function in emergency mode only when normal power is absent.

viii. Closets less than 70 square feet may use countdown timer switches with a maximum setting capability of ten minutes to comply with the automatic shut-Off requirements.

ix. Lighting in a Server Aisle in a Server Room, as defined in Section 100.1, may use countdown timer switches with a maximum setting capability of 30 minutes to comply with the automatic shut-OFF requirements.

f. Automatic Daylighting Controls – Section 130.1(d)

i. **EXCEPTION 1 to Section 130.1(d):** Areas under skylights where it is documented that existing adjacent structures or natural objects block direct sunlight for more than 1,500 daytime hours per year between 8 a.m. and 4 p.m.

ii. **EXCEPTION 3 to Section 130.1(d):** Rooms in which the combined total installed wattage of the general lighting power in the Skylit Daylit Zone and Primary Sidelit Daylit Zone and Secondary Sidelit zone is less than 120 Watts.

iii. **EXCEPTION 4 to Section 130.1(d):** For parking garages, the total combined general lighting power in the primary sidelit daylight zones is less than 60 watts.

iv. **EXCEPTION 5 to Section 130.1(d): Rooms** that have a total glazing area of less than 24 square feet, or parking garage areas with a combined total of less than 36 square feet of glazing or opening.

v. EXCEPTION **6 to Section 130.1(d):** For parking garages, luminaires located in the daylight adaptation zone.

g. Demand Response Controls – Section 130.1(e)

i. Buildings with lighting system having a total installed lighting power of 4,000 watts or greater are subject to the requirements of Section 130.1(b): Multilevel lighting controls, shall be capable of automatically reducing lighting power in response to ademand Response Signal; so that the total lighting power of non-excluded spaces can be lowered by a minimum of 15 % below the total installed

lighting power when a Demand Response Signal is received. Lighting shall be reduced in a manner consistent with uniform level of illumination requirements in TABLE 130.1-A.

ii. **EXCEPTION to Section 130.1(e):** Lighting not permitted by a health or life safety statute, ordinance, or regulation to be reduced shall not be counted toward the total lighting power.

Please reference most recent Title 24 controls' exceptions:
http://www.energy.ca.gov/title24/

h. Locate all light switches near the main entry doors.

i. Specify multi-level switching in spaces. In areas with day-lighting, specify separate, remote switch to control bank of lights adjacent to daylight source. In other areas switch lamps within fixtures individually to allow light level control. Review switch locations with designated District Representative prior to finalizing plans.

j. Specify keyed switches in gyms, multi-purpose rooms, cafeterias, hallways and auditoriums.

k. Provide keyed light switches with dual sensor motion detectors in student restrooms.

l. Exterior lighting to be coordinated with and controlled by photocell input to activate lights; and use of astronomical clock for shut down. This includes site lighting as well as light fixtures attached to building exteriors.

m. Specify lighting control panels with dimmers for theatrical and specialty event lighting in assembly areas.

n. Single line diagrams for controls and required certification should be provided to the district for the design approval.

12. Exterior Lighting:

a. At a minimum, lighting shall meet Title 24 requirements for energy efficiency and comply with CHPS recommended guidelines (http://www.energy.ca.gov/title24/).

b. Must be part of Design Lights Consortium's (DLC's) Qualified Product List (QPL) and meet most recent DLC Technical Requirements. An example can be found at www.designlights.org/default/assets/File/SSL/DLC_Technical-Requirements-V4-2.pdf

c. Exterior lighting shall be heavy-duty and vandal-resistant per District standard light fixture schedule.

d. Exterior lighting for new construction or major renovations is to be controlled with astronomical clock and photocells to comply with the most current version of Title 24. All exterior lighting controls should be standalone and not part of an integral BMS system unless otherwise approved by the District.

e. Minimize use of pole lights where possible.

f. Utilize soffit lights where possible and coordinate location with doors.

g. Provide general lighting of entire exterior of building compound, primary walkways and parking lots. Design exterior lighting system to achieve a minimum maintained 1.5-foot candle. Provide photometric study to show compliance.

h. Exterior lighting to be designed to minimize light pollution and avoid overspill to adjacent properties. Specify full cut-off fixture with the use of house side shields.

i. Determine the CHPS points to be obtained through lighting and meet the requirements.

j. Design is to be reviewed and approved prior to finalizing.

k. Apply motion sensing controls to exterior lighting if outdoor luminaire is mounted or below 24 ft and more than 40 watts, and acceptable for safety.

13. Emergency Lighting:

a. Egress lighting shall derive its power from the Emergency Generator. Bug-eye lights or individual battery packs will not be allowed on new construction projects. Specify wire guards in locker rooms, multi- purpose rooms, gyms and vandal-prone areas.

b. Exit Signage: Coordinate faceplate color to match adjacent wall color. Secure with tamper-resistant fasteners.

c. Exit signs shall be LED type with vandal-resistant system with polycarbonate shields or wire guards.

d. Emergency light indicators shall be visible and located outside of the lighting fixture.

14. Acceptance Testing:

a. All lighting projects shall be in accordance with the latest version of the Nonresidential Compliance Manual chapter 13 for lighting https://www.energy.ca.gov/programs-and-topics/programs/building- energy-efficiency-standards

I. General Technology and Low Voltage System Requirements

1. The Design Professionals shall design a fully functioning system(s) according to the provided specifications.

2. Technology equipment is to have dedicated power.

3. The Design Professionals are to provide drawing submittals to the District Representative at each phase submittal indicating the required scope and proposed pathways for District review and comment. Proposed device layouts shall be indicated on drawings at the beginning of the Construction Document Phase.

4. The Design Professionals are responsible for the coordination, finalization and incorporation of the design for the backbone/infrastructure pathway to accommodate the cabling and installation of devices/receptacles for telephone/voice, data, digital intercom/clock and bell, intrusion, video monitoring (CCTV), video distribution (CATV), classroom AV (including voice amplification), large assembly areas AV and any other systems required for the project.
5. The Design Professionals are required to attend coordination meetings with the designated District Representative and District's technology representative.
6. Engineer shall consult with a Registered Communications Distributions Designer (RCDD) for all technology and low voltage.
7. At the beginning of the design phase the District will determine if the cabling and components associated with the Structured Cabling System and Data Communications Active Infrastructure will be specified under a separate E-Rate contract for installation only.
8. Where vending machines are located provide duplex data outlets at 6-feet above finish floor. If located at exterior, provide weather proof duplex data outlets.
9. All data outlets to be a minimum of duplex data outlet, unless noted otherwise.

J. Intrusion Detection System

1. Do not specify any door contacts.
2. Coordinate keypad locations with District Representative.
3. Provide dual technology motion detectors.
4. Head end equipment shall be located in the MDF room.
5. For additional information, refer to Volume 2 Master Specification: 28 16 00 Intrusion Detection System for District Standard system.

K. Digital Video Surveillance System (CCTV)

1. Camera locations must be confirmed with District Representative. The goal is to capture exterior perimeters, entrances and exits, administrative reception areas, and the pool.
2. The system is not intended to cover the entire campus, only the areas of concern.
3. Provide a storage array system at the headend; analog is not acceptable.
4. Provide Bosch Video Management System (BVMS) head end equipment and locate in the MDF room.
5. Provide an auto shut down sequence.
6. Drawings must have a camera schedule that indicates the following: camera model number, part number, mounting type, required accessories, power requirements, licensing and software options.
7. For additional information, refer to Volume 2 Master Specification: 28 23 00 Digital Video Surveillance System.

L. Digital Intercom, Clock and Bell System

1. Show all Remote Addressable Units (RAU), clock and speaker locations.

2. RAUs shall be located in IDF room. RAUs shall have (1) 120V quad receptacle located inside of cabinet.
3. Provide at least one ACT switch ("lockdown button") and locate in the Administration office. The location should be accessible to Administrative staff and not in any individual's office or a public space.
4. Coordinate exact location with District Representative.
5. Provide two telephones for All Call capabilities. Locate one in an area accessible to Administrative staff, not in an area of public use or high traffic. Locate the other in the Principal's Office.
6. Provide override page interface with Extron AV equipment.
7. Head end equipment shall be located in the MDF room. Provide enough space for full size 7-foot rack. If there is not sufficient space in the MDF for head end equipment, provide alternate location with guidance from District Representative; provide a Variance Request.
8. The Head end equipment shall have one (1) 120V dedicated quad receptacle.
9. Provide at least one combination clock and speaker unit in all spaces except the following:
    a. Corridors
    b. Restrooms
    c. MDF/IDF Rooms
    d. Utility Rooms
    e. Storage Rooms
10. Provide speakers in corridors and hallways.
11. Speaker zoning:
    a. Each classroom shall be considered one zone.
    b. Each outside horn shall be considered one zone.
    c. Each grade level shall be considered one zone.
    d. Corridors may be on one zone.
12. Distribute exterior speakers for play fields, lunch shelters, and throughout the entire site for adequate sound amplification without exceeding local zoning and noise ordinances. Refer to local agencies for specific zoning, noise criteria, and measurement methods.
13. For additional information, refer to Volume 2 Master Specification: 27 50 00 Digital Intercom, Clock and Bell System

M. Structured Cabling System

1. Design the cabling system to include separate data outlets for the VoIP phone system.
2. Provide a minimum of one (1) two inch "spare" conduit in addition to required pathway for structured cabling systems.
3. Cable trays are not allowed except in open ceiling spaces.

4. Provide "J" hooks in above ceiling interior pathways.

5. For additional information, refer to Volume 2 Master Specification: 27 10 00 Structured Cabling System.

N. Voice Communications System

6. Voice Communication VoIP Phone system CAT6 cabling will be provided as part of the Structured Cabling System, Specification 27 10 00.

7. PoE switches for the VoIP Phone system will be provided by the Data Communications Active Infrastructure Specification 27 20 00.

8. Provide a port for paging interface with 27 50 00 Digital Intercom Clock and Bell.

9. Installation shall integrate into existing telephone system, coordinate Design with District Representative.

10. Provide a minimum of 25 pair copper to every IDF.

    a. Do not specify 110 punch down blocks, only specify 66 terminal blocks for 25 pair copper.

11. For additional information, refer to Volume 2 Master Specification: 27 30 00 Voice Communications.

O. Audiovisual System

1. In scenarios where an existing Audiovisual system is present, Contractor will clarify scope with District Representative prior to removing the old system. District Representative may decide to interface existing audio with audiovisual system if it is compatible and superior in quality.

2. In both Hard Lid and Soft Lid scenarios check the structural ceiling to ensure that it can support a load four (4) times the weight of the final setup.

3. Design team to evaluate if vibration is a concern for projector mounting in Hard Lid scenarios.

4. All Audiovisual Systems and, projection screens, shall be Contractor Furnished Contractor Installed (projectors to be Owner Furnished Contractor Installed).

5. Provide a page sensor, Page First Priority, to all spaces that integrate AV with ICS.

6. Provide a minimum of two (2) recessed speakers.

7. Provide quad power receptacle for projector.

8. For additional information, refer to Volume 2 Master Specification: 27 41

9. 16 Audiovisual Systems

P. Data Communications Active Infrastructure

1. Provide rack elevations, single line diagram, and switch port counts for the MDF and each IDF, for District review and approval. All quantities must be indicated in the rack elevations.

2. System must be able to be remotely managed by existing District CiscoWorks LAN Management Solution (LMS).

3. Provide UPS system at MDF. Provide PDU at each IDF.

4. Each UPS must be remotely monitored with SNMP WEB CARD.
5. Provide redundant power supplies at each IDF/MDF.
6. Provide licenses for wireless access points and tie into existing wireless controllers at District Office.
7. Provide data outlet for Wireless Access Points throughout the entire campus including, but not limited to, Library, MPR, Gym, Administration, exterior roll call area for PE, interior and exterior access for Point-of-Sale system, and all classrooms.
8. In rooms with thirteen-foot ceiling heights or more, wall mount the WAP at ten feet above finish floor.
9. For additional information, refer to Volume 2 Master Specification: 27 20 00 Data Communications Active Infrastructure.

Q. Assistive Listening System

1. Confirm with the District requirements for both new construction and renovations.
2. If a portable system is required, provide a system capable of use on field trips.
3. Coordinate Power requirements.
4. Coordinate antenna frequency with Autonomous Sound System and AV Systems.
5. For additional information, refer to Volume 2 Master Specification: 27 51 26 Assistive Listening System.

R. Book Theft Protection Equipment System

1. Provide a book detection system at all High School Media Centers. At Elementary and Middle School Media Centers, provide adequate power near the circulation desk for potential future installations of book detection systems.
2. The Media Center book drop is not part of the book detection system.
3. Provide buried cable system in lieu of surface mounted cable between detection isles.
4. Provide minimum 1-1/4 inch non-metallic conduit connection from first aisle to second aisle, then stub down and up to second aisle.
5. Indicate location of surface mounted control box on drawings. Surface mounted control box must have the following:
    a. Location that is serviceable and accessible.
    b. Box cover with louvers for ventilation
    c. An electrical convenience receptacle on wall adjacent to control box for connecting system power supply box.
6. Provide audio and visual alarm.
7. Maintain a proper distance between the Detection system and large metal objects. The minimum distances from a Detection System Panel to a wall using metal studs and metal windows, doors, walls, cabinets, shelves, pipes, counter edges, display cases wastebaskets, and furniture is 18-inches.
8. Locate the electronic enclosure within 10 feet of a power receptacle.

9. The allowable distance between the electronics enclosure and a detection panel is 4 feet minimum; 21 feet maximum.
10. Maintain a minimum of 7 feet from the Detection System to a CRT (computer) display.
11. Avoid positioning the Detection System within 5 feet of power panels, data cables, and large conduits.
12. Provide a 4-foot clear space between the system panels and any door.
13. Locate the system to allow good observation/supervision of the system by the circulation desk staff.
14. Books and other secured items must be stored at least 3 feet from the Detection System.
15. Power requirements for the entire system are computer-based devices that require high quality, sure and noise free electrical power for optimum performance.
16. Single phase power is required. The system is supplied with a 16 gauge, 3-wire, S-rating 10 ft. long NEMA 5-15 plug.
17. Provide in-counter book demagnetization system flush with casework.
18. For additional information, refer to Volume 2 Master Specification: 11 51 19 Book Theft Protection Equipment.

S. Specific Room Requirements

1. Multi-Purpose / Lecture Hall / Auditorium:

a. AV System:

i. Provide **an** AV System with projection and projection screen.

ii. Provide **quad** power receptacle next to AV rack location. The exact location must be field coordinated to ensure receptacle aligns with the knockout provided in the AV rack.

iii. Provide 3-gang box in the ceiling to accommodate an AV projector. Projector inputs to be routed in 1¼ inch conduit to AV rack.

iv. **Provide** a minimum of one guest location for audiovisual input and controls for laptop connection.

a) Provide a 2-gang box with 1 ¼ inch conduit to AV rack.

v. **Provide** 4-gang box for lockable AV controller. AV controller includes the projection screen controller.

a) AV controller with 4-gang box to be routed in 1¼ inch conduit to AV rack.

vi. **For** additional information, refer to Volume 2 Specifications: 11 52 13 Projection Screens and Master Specification: 27 41 16 Audiovisual Systems.

b. Campus wide intercom/clock system is a separate system from the AV System.

c. Provide a fully enclosed lockable IDF cabinet, adjacent to AV rack, and at or

near the stage area.

vii. **Provide** quad power receptacle adjacent to IDF, coordinate exact location with District Representative.

viii. Provide a **minimum** of two data outlets at ceiling per wireless access point.

d. Provide data outlets for each register Point of Sale (POS) system at ticket booths.

e. Provide a 4-gang floor box at the stage with microphone jacks, data outlets, and quad power receptacle.

f. If the MPR is utilized for food services, provide data outlets for each register Point of Sale (POS) system; one homerun data to kitchen office POS system and one homerun data to nearest IDF.

g. If there are ticket sale booths or snack bars, provide data outlets for each register POS system.

h. Lighting Levels:

i. Multi-**Purpose** Rooms: Average maintained 30-foot candles at the play/eating surface.

ii. Theater: Light **fixtures** and lighting design to be proposed by Design Professional to designated District Representative prior to finalizing design.

2. Gymnasium:

i. Provide multi-sport scoreboard with remote controllers. Provide two shot clocks for basketball. Provide two score boards for high school. Provide one for middle school unless a single score board is not visible from all portions of the gym.

j. Provide autonomous multi-media sound system to accommodate athletic events with wireless microphones. This system is separate from the school wide intercom, clock, and bell system. No video, no projectors.

i. Provide quad power receptacle at ceiling for speaker array.

ii. Aim autonomous sound speakers to cover all bleachers when fully extended.

k. Provide minimum of two (one on either side of the main court) 10-inch by 12-inch by 4-inch floor boxes with microphone, data, scoreboard controls, speaker connections, and power.

l. Provide one clock and speaker combo near the main entrance in the gym and one in the lobby. Provide additional speakers as necessary. Provide protective guard for clock.

m. Provide data outlet for each register POS system at the snack bar.

n. Lighting Levels:

i. Sporting Events: Average maintained 80-foot candles at the horizontal playing surface.

ii. Social Events: Average maintained 25-foot candles at the horizontal surface.

iii. Lockers: Minimum maintained 10-foot candles at the horizontal surface(s).

3. Conference Rooms:

o. AV System:

i. Provide an AV System with projection and a manual projection screen.

ii. For additional information, refer to Volume 2 Specifications: 11 52 13 Projection Screens and Master Specification: 27 41 16 Audiovisual Systems and Volume 4 – Classroom Sample Layout drawings.

iii. Provide a three-gang back box with double gang reducing ring for the AV controller with volume control on face plate, (1¼ inch conduit) adjacent to the light switch.

p. Provide at least one duplex data outlet on a wall.

q. Provide a double gang floor box with quad power receptacle, duplex data outlet, dual HDMI, and 3.5 mm jack below center of conference table.

r. Lighting Level: Average maintained 50-foot candles at the horizontal work surface, with a minimum of 30-foot candles at any location.

4. Classroom:

a. AV System:

i. Provide an AV System with projection and a manual projection screen.

ii. For additional information, refer to Volume 2 Specifications: 11 52 13 Projection Screens and Master Specification: 27 41 16 Audiovisual Systems and Volume 4 – Classroom Sample Layout drawings.

iii. Provide data, electrical, ALS output, AV MLC, AV (HDMI) input in the front of the classroom with 1¼ inch conduit.

iv. Provide two audiovisual speakers flush mounted in ceiling.

b. At the Teacher's Desk provide:

i. Provide a three-gang box for dual HDMI, and 3.5 mm audio jack (1 ¼" conduit).

ii. Provide a single gang box data.

iii. Provide quad power receptacle adjacent to double gang box above.

iv. Provide double gang box for Media Link Controller (MLC) with volume control on face plate, (1¼ inch conduit) all located in same stud bay.

v. Provide one (1) computer and one (1) local printer

vi. Refer to Volume 4 - Teacher's Desk AV and Power Requirements Drawing.

c. In addition to the Teacher's desk power and data requirements, provide a minimum of one duplex data outlet on the same wall.

d. Locate combination clock and speaker unit opposite teaching wall at the back of the classroom.

e. Lighting Levels:

i. Minimum maintained 5-foot candles at the vertical surface(s), including marker boards.

ii. Average maintained 35 to 50-foot candles at the horizontal work surface, with a minimum of 25-foot candles at any point more than 3-feet from any wall.

5. Computer Lab:

a. Provide duplex data outlets and duplex power receptacles on the back wall for large printers.

b. Locate combination clock and speaker unit opposite teaching wall at the back of the classroom.

c. Provide quad power receptacle and six data outlets at every computer bank location (maximum six computers per computer bank).

d. Provide minimum of nine circuits per computer classroom – one at each computer bank, one at printer area, one at teacher's desk, one for housekeeping purposes.

e. AV System:

i. Provide data, electrical, (HDMI) input and ALS output in the front of the classroom and the back of the classroom with 1¼ inch conduit.

ii. Provide two audiovisual speakers flush mounted in ceiling.

f. At the Teacher's Desk provide:

i. Provide single gang box for phone, data.

ii. Provide a three-gang box for dual HDMI, and 3.5mm output audio jack (1¼ inch conduit).

iii. Provide quad power receptacle adjacent to double gang box above.

iv. Provide three-gang box with double gang reducing ring for Media Link Controller (MLC) with volume control on face plate, (1¼ inch conduit) all located in same stud bay.

v. Refer to Volume 4 - Teacher's Desk AV, Power & Data Requirements Drawing.

6. Media Center (Library):

a. Provide one clock and speaker combo. Provide additional recessed ceiling mounted speakers as necessary.

b. Provide data and power at the end of the stacks for catalog look up stations. Confirm number of locations with architectural.

c. Provide data and power for the Online Public Access Catalog research stations. Confirm number and location with architectural.

d. AV System:

i. Provide an AV System with projection and a manual projection screen.

ii. For additional information, refer to Volume 2 Specifications: 11 52 13 Projection Screens and Master Specification: 27 41 16 Audiovisual Systems and Volume 4 – Classroom Sample Layout drawings:

iii. Provide two audiovisual speakers flush mounted in ceiling.

iv. At the front of the teaching area provide:

a) Single gang box for phone, data.

b) Three-gang box for dual HDMI, and 3.5-mm output audio jack (1¼ inch conduit).

c) Quad power receptacle adjacent to double gang box above.

d) Three-gang box with double gang reducing ring for Media Link Controller (MLC) with volume control on face plate, (1¼ inch conduit) all located in same stud bay.

v. Lighting Level: Average maintained 50-foot candles at the horizontal work surface, with a minimum of 30-foot candles at any location.

7. Administration/Reception/Lobby:

a. Provide wireless access (data and power at ceiling).

b. Provide surface mounted clock/speaker in all offices.

c. Provide analog fax line, telephone line, and 911 phone line.

d. Coordinate electrical receptacles and power requirements for copiers and printers.

e. Coordinate with architectural program and furniture layout to provide adequate power receptacles and data outlets at open administrative office areas. Provide a minimum of one duplex receptacle and one data outlet at each workstation.

f. Lighting Level for Offices: Average maintained 50-foot candles at the horizontal work surface, with a minimum of 30-foot candles at any location.

8. Textbook Storage Rooms:

a. Provide duplex data outlet.

9. Minimum Point of Entry (MPOE):
   a. MPOE must be located in the MDF room.
   b. MPOE shall include:
      i. Copper and Fiber.
10. Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF) Rooms:
   a. The MDF and IDF rooms are dedicated only for Data, Fiber, CATV, Clock and Speaker, Telephone, Security and UPS backup.
   b. MDF Rooms:
      i. Place on the first floor and adjacent to the main electrical room.
      ii. Provide a minimum of four open data full-racks with 3-foot clearance at the front and back of the rack and enough space for at least one additional future rack.
      iii. Three data drops: two data at 18 inches above finish floor and one phone wall mounted at 48 inches above finish floor all located next to the door.
      iv. Provide a 20 Amp receptacle at 42 inches above finish floor for CATV, EMS, FACP, and Security.
   c. MDF and IDF Rooms:
      i. Wrap the room in ladder rack with access to the top of the racks at both north-south and east-west creating a cross ladder rack. Attach to top of data rack.
      ii. Provide dual technology motion sensors for lights and two Emergency Lights.
      iii. Provide a quad power receptacle at 18 inches above finish floor centrally located on each wall.
      iv. Run conduit along bottom of ladder racking to top of each rack and mount quad 20 Amp dedicated box. Provide one ladder rack mounted quad receptacle above each cabinet and future cabinet.
      v. Provide a dedicated split system AC with gravity fed condensate lines. Dedicated air conditioning required 24/7/365. Ventilation only is not acceptable.
      vi. Overhead service conduits are preferred. If underground conduits are utilized, conduits shall be in a single row and flush against the wall.
      vii. Provide a minimum of ten percent spare conduits.
      viii. Avoid sharing any walls of an MDF or IDF room with restrooms or where water is present.
      ix. Lighting Levels: Provide 40-50 foot-candles at 12 inches above finish floor at front and back of rack.
      x. Provide correct electrical receptacle for Uninterrupted Power Supply (UPS). For example, the Trip Lite SU3000 and higher models require

a 220-volt circuit.

d. IDF Rooms:

xi. Each building shall have at least one IDF and IDF's can be wall mounted cabinets, provided they are mounted on plywood backing.

xii. Stack IDF rooms if multi-level building and provide at least one IDF per floor.

xiii. Two data racks with 3-foot clearance at the front and back of rack and enough spacing for at least one additional future rack.

xiv. Provide a 20 Amp dedicated receptacle at 42 inches above finish floor for CATV.

11. Kitchens:

a. Provide an additional data outlet in the Kitchen Manager's Office to connect with the Point Of Sale system.

b. Lighting Levels:

i. Kitchen/Food Preparation: Average maintained 70-foot candles at the horizontal surface(s).

ii. Dining: Average maintained 30-foot candles at the horizontal surface(s).

12. Elevator:

a. Provide dedicated analog phone line to elevator cab.

13. Restrooms:

a. Lighting Level: Minimum maintained 20-foot candles at the horizontal surface(s).

14. Corridors:

a. Lighting Level: Minimum maintained 10-foot candles at the horizontal surface(s).

T. Fire Alarm System:

15. The District's preferred location for all speakers and strobes is on the ceiling. If ceiling is 12 feet or above then in lieu of in the ceiling, place on the wall, opposite of the door.

16. Do not size the fire alarm control panel for more than 15 percent over a school's total proposed fire alarm device capacity. Confirm project requirements including existing fire alarm system and master planning at each site.

17. Provide fire alarm control panels with a dedicated analog telephone line and an alternate transmission method per NFPA 72 code requirements. Confirm alternate transmission method with District, including existing sites.

18. Fire alarm amplifier equipment must be located in each building and in air conditioned or ventilated space as necessary to ensure operation.

19. Fire alarm systems shall include one manual pull station located in the campus administrative office.

20. A remote annunciator panel shall be located at the main entrance or main office. Confirm location of both FACP and remote annunciator with District, including existing sites.

21. All Data Gathering Panels and Notification Appliance Circuits shall have a smoke detector located above the panel.

22. Confirm integration requirements needed for Public Address, Assembly Room Audiovisual, Autonomous Audio, Assembly Room Lighting, and HVAC systems.

23. A fire alarm zoning map shall be CFCI.

End of Part

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I. General Renovation Project Items

The preceding PART 2 "General and New Construction" standards also apply to Renovation projects. The following requirements address specific items that only apply to renovation projects. These standards are not meant to dictate scope, but rather clarify the requirements when included in the project specific scope statement.

A. The following design standards are the goal for the District's renovation projects when the budget permits. It is the Design Professional's responsibility to confirm scope within the budget established as project progresses through the design phase per the A/E Agreement. The designated District Representative may alter these requirements to accommodate budget constraints.

B. These renovation standards also apply to relocation and renovation of manufactured buildings.

C. The District will provide the Design Professional with a scope statement that will provide the budget for scope items to be evaluated and incorporated into the contract documents.

D. Modifications requested by the site are to be identified and discussed with the District prior to taking action. Under no circumstance should site staff be left with the impression that work outside the contractual scope will be included in the project.

E. The District will make available to the Design Professional original plans, record drawings and maintenance projects records for their use. The District's documents will vary in format and are not guaranteed to be accurate. Some sites will not have record drawings available. The Design Professional is required to confirm record drawing information on the site and supply missing information based on field survey.

F. Areas that have been modified without DSA application number (e.g. added walls, air conditioning units with unapproved structural support, lofts, storage areas and freestanding storage sheds, and etcetera) are to be identified and discussed with the District for possible removal, modification, or other appropriate action.

G. Phasing and Interim Housing: The Design Professional shall prepare a phasing plan based on the District's ability to house students and the number of students to be displaced by the work. Design Professional is to develop the interim housing plan with the designated District Representative in the Master Plan phase.

H. Hazardous Materials: The District will employ a hazardous materials consultant to determine the impact of the scope on existing materials and test those materials. The Design Professional must supply sufficient documentation to the District's consultant to allow testing of the correct materials including any underground utilities that may be impacted by the new work. The hazardous material consultant will be preparing exhibits to the construction contract for the abatement procedures necessary to complete the renovation scope of work. They also will be monitoring the abatement work that will be performed under the Contractor's contract. The Design Professional is not responsible for determining if materials contain hazardous materials,

determining scope of abatement necessary or monitoring the abatement procedures, but need to reference the abatement exhibits.

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II. Site Work for Renovation Projects

Investigate and document existing site conditions. The record drawings shall not be used as a basis for design.

A. If specific scope of work necessitates excavation, ensure that the contractor is responsible to employ an underground locator service to identify underground utilities of select areas. The construction contract is to require the contractor to be wholly responsible for damage to existing underground utilities and resulting damage. Require the Contractor to contact Dig Alert or other public utility locaters in addition to the underground on-site utility locators.

B. Include rebar dowels for new concrete abutting existing concrete. Please refer to the District standard detail included in the Appendix.

C. Evaluate the condition of the existing chain link fencing and specify necessary repairs or replacement.

1. Replace rusted chain link fabric with new.
2. Where chain link posts are rusted, remove fabric, prepare posts and paint, and then reinstall fabric. Replace rusty accessories.
3. Where fence posts are leaning, remove post and footing and reinstall.
4. Where chain link fabric has been damaged or bent, replace fabric panel from post to post.

D. The scope may include items that will disturb existing landscaping and irrigations systems. The contract requirements should address the need to maintain irrigation water if irrigation lines are partially removed or broken. Also, note that turf and other planting must be protected and returned to its original condition, or replaced, at the end of the project.

E. Provide enclosure around the seismic shut-offs valves complete with a chain link lid and locked access or can be located in secure enclosure with other utilities when possible.

F. Electrical service transformer and switchgear locations to be approved by Southern California Edison (SCE) prior to the start of work. The utility yard shall have a concrete pad and either a concrete masonry unit (CMU) enclosure or opaque metal fence depending on design, locking metal gates, and a removable chain link cover per SCE requirements.

1. When new equipment is replacing existing, locate equipment in an area that will allow existing equipment to remain in operation until construction is complete.

G. Sports Fields can be either natural turf or artificial turf. Consult the District Representative on a project-by-project basis for the type of sports field to be used.

1. Artificial Turf Applications over Existing Asphalt: Synthetic turf rubber systems over existing asphalt do not require irrigation and drainage systems. Do not specify rubber pellets.

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III. Architectural Items for Renovation Projects

A. Disabled Access for Renovation Projects

1. Evaluate the existing site and building conditions and indicate scope of work needed to comply with current code requirements for accessibility compliance.

2. Include with the proposed scope of work an estimate of the cost to achieve accessibility. Compare the cost to the overall construction cost to assist the designated District Representative with State funding application.

3. If during the plan review process, DSA requires additional scope of work to be included to obtain approval, forward specific requests and code references to the designated District Representative.

4. If developing a Topographical Survey is not included in the project scope of work, request from the designated District Representative an independent land survey that establishes existing grades to determine optimum design solution for disabled path of travel. The Design Professional shall work with the District's Surveyor to verify the elevations needed to determine compliance.

5. The following accessible items should be included in projects, even if not required by the DSA:

   a. Doors and gates to the administration building and along the path of travel to the work site shall be accessible.

   b. Restrooms within the project area, or to be used by occupants of the project area are to be accessible.

6. Room and building signage. Review existing room and building signage against current standard. Signage needs may vary based on types of signs, types of buildings, etc. Review with District if signs are to match existing signs program or if they are to be replaced to meet current District Standard. Advise District if existing signage does not comply with current code.

7. The District's preference is for ramps, however where impractical specify wheelchair lifts.

8. Design the modifications to casework that has a sink to accommodate access for the disabled. Replace adjoining casework to match if budget permits.

9. Other potential site-specific requirements requested by DSA or identified by the Design Professional should be discussed with the District.

H. Evaluate the existing site and building conditions and indicate scope of work needed, including accessibility upgrades and other recommendations. Incorporate findings into the Field Report due at the end of the Schematic Design phase and update as necessary in subsequent submittals.

I. Low Voltage Utility Rooms: Provide low voltage utility rooms as described in the General Building Design Standards.

J. Existing Building Exteriors and Finishes

1. Exterior surfaces of buildings are to be free of peeling paint and in general good condition free of discoloration and graffiti.

2. Exposed masonry exteriors are to be cleaned, repaired, sealed and treated. Loose or unstable masonry shall be repaired or replaced.

3. Specify brick restoration, not cleaning and patching, where brick surfaces are in disrepair.

K. Existing Roofs

1. See General Design Standards for required roofing materials.

2. The ability to climb on the roof should be eliminated. Modified or restrict access to items that allow access to the roof.

3. Survey existing condition of substrate (from underside where possible). If selective demolition is necessary to investigate an area suspected of dry rot or termite damage, notify the District. Include in base contract all known structural repairs. Determine anticipated amount of unknown structural repairs and estimated costs. Include as a bid allowance with standard structural repair details.

4. Require in contract the removal of roofing material to structural substrate and the replacement or repair of the existing structural substrate. Include removal of flashing and counter flashing. Verify if multiple roofs exist below the current roof.

5. Require the Contractor to remove and replace roof mounted items such as piping, ducts and air handling equipment, if required to install new roof and flashings.

6. Where standing water is an issue or on flat roofs use tapered insulation. Maximum tapered insulation thickness at the high point is 12-inches.

7. Equipment to be installed eight inches minimum above the roof surface (finish surface) for proper flashing and to meet the manufacturer's warranty. Replace curbs and platforms if necessary.

8. Provide walkway pads around existing and new rooftop equipment and at roof access ladders or roof access hatches. When installed at existing and new rooftop equipment, install on service side of equipment.

9. When the project scope only requires roof patching, survey the area to be patched. Verify compatibility with existing roofing material and provide details that will not void the warranty.

10. Asbestos abatement for existing roofs will be designed by a separate consultant, hired by the District. Notify District if a hazardous material report is not received for the existing roofing materials.

L. Existing Gutters and Downspouts

1. Remove and replace existing rain gutters and downspouts. See General Design Standards for gutters.

2. Where no gutters exist, add gutters to the roof design where necessary.

3. Where existing downspouts drain across walkways, tie downspouts into the storm drain system with indirect connection via drain inlet.

M. Painting of Renovation Projects

1. If scope statement includes requirement to repaint buildings, include in scope complete painting of existing items previously painted and new items included under this contract. Specifically indicate painting of new and existing unpainted conduits, pull boxes, fascias, doors and frames, flashings, gutters, downspouts, and restoration of areas adjacent to work installed. Require painting of existing railings only when previously painted, and in need of repainting. All new railings are to be galvanized finish.
2. Interior painting to include walls, ceilings, clerestories, doors, frames, and trim.
3. Provide note that requires the contractor to paint the entire surface, from corner to corner, of a wall that is patched or repaired.
4. Include repainting of casework, if previously painted, including the interiors. Strip to bare wood and refinish stained or damaged casework.
5. Exterior surface preparation to include sandblasting of metal surfaces where required, high pressure washing of other surfaces and filling of cracks in cement plaster and veneer surfaces.
6. Coordinate surface preparation with lead paint surface preparation specification provided by separate consultant hired by the District. Design Professional to assume schools built before 1970 have been painted with lead containing paints.

N. Existing Casework

1. Design Professional to survey the existing casework to determine necessary repairs for drawers, doors, shelving, and appearance.
2. Replace adjacent casework to accommodate new accessible sink cabinet only when the condition warrants replacement. If adjacent casework is in good repair, then a stepped countertop is acceptable to the District.

O. Existing Ceilings

1. Design Professional to survey the existing ceilings and determine necessary removal and replacement. The District does not want patched repaired ceilings.
2. If mechanical, plumbing, or electrical work is being performed in attic space; coordinate the necessary repair and replacement of ceiling, ceiling tiles, and insulation required to gain access to the attic.
3. Review options to add ceiling insulation where existing ceiling system is removed, and new suspended ceiling is added.

P. Existing Doors and Frames

1. Evaluate the condition of doors, hardware and frames to determine if repair or replacement is necessary. Doors, hardware and frames are to be replaced to

accommodate disabled accessibility or if they need repair due to damage or are not secure. Prepare the results for their survey in a report and review on site with the designated District Representative.

2. Following are the standards for door replacement:

   a. If doors need to be replaced that are in primary location and exhibit architectural detailing significant to the appearance of the campus, then the door shall be replaced to match existing.

   b. Exterior doors shall be metal doors. Exterior wood doors are to be replaced in all cases. Specify the heavy-duty door type indicated in the outline specifications at doors subject to abuse such as Gyms, locker rooms and the like.

   c. New doors shall meet the requirements of the General Design Standards.

3. Replacement doors shall have a vision light if in an occupied space even if original door did not have one unless there is a side light present. Please refer to the General Design Standards.

4. Replace doorframes under any one of the following conditions:

   a. Existing doorframes are made of wood.

   b. Existing doorframes are to be rated but do not have a label. Existing doorframes are damaged beyond repair.

   c. The door within the frame is being reversed in either direction.

5. Replacement door frames in existing walls may be “knock-down” or punch and dimple.

Q. Door Hardware for Renovation Projects

1. General:

   a. Survey the existing doors and hardware to determine appropriate replacement details and specifications.

   b. Completed door survey and recommendations must be reviewed by the designated District Representative prior to completing finished hardware specification.

   c. Submit completed finished hardware specification to designated District

   d. Representative for review and acceptance prior to including in bid documents.

2. Keying and hardware to be the same as described in the General Design Standard. If hardware exists that is above and beyond the General Design Standard, maintain or replace the item as a like-for-like, within current code compliance requirements.

R. Existing Storefront and Window Systems

1. Survey the existing window systems and hardware to make recommendations on replacement, retrofit or repair.

2. Replace jalousie-type windows with new windows.

3. Field verify existing glazing types and include in scope the replacement of existing non-glass, wood, Plexiglas, and glazing infill panels with safety glass. New glazing shall match existing tint.

4. Replace wood glazing systems in their entirety with new aluminum frame with insulated glass (1" nominal thickness – see Vol. 2 Section 08 80 00 Glazing for additional information).

5. Obtain recommendations from the mechanical engineer on the U values and solar heat gain coefficient required for the glazing. The maximum U values, maximum solar heat gain coefficient, and minimum visible transmittance must meet the most current Building Energy Efficiency Standards Prescriptive Requirements of additions or alterations or comply with Title 24 calculations using performance- based method. Low-E coating should be placed on at least one of the glass surfaces facing the air space.

S. Existing Skylights

1. Evaluate the conditions of existing skylights and make recommendations to the District Representative.

T. Restroom Upgrades for Renovation Projects

1. Major renovation is the relocation and repair of the majority of fixtures in a restroom. Minor renovation is restoration of existing fixtures and accessories.

2. Provide schematic layout of reconfigured Restroom prior to proceeding with construction documents. Notify the District if the water closet or urinal count has been reduced. Confirm with California Department of Education and CBC fixture count requirements that the campus complies if the count is reduced.

3. Restrooms designated for major renovation shall receive new finishes, fixtures and restroom accessories. Require the Contractor to remove the ceiling, wall materials (to bare studs), and to remove entire slab to accommodate new plumbing.

4. Remove and replace existing partitions and accessories at all renovation projects. See the General Design Standards for Partitions and Accessories.

5. When required by the scope, the replacement of one plumbing fixture in a restroom shall constitute the replacement of all fixtures in that room to match.

6. Restroom Finishes:

   a. On minor renovation projects where the existing flooring is terrazzo, specify terrazzo restoration.

   b. Retain existing finishes only if the restroom is already accessible and minor upgrades are necessary. If new fixtures and accessories are in new locations, remove finishes.

   c. If the existing flooring is concrete specify new epoxy finish.

   d. Provide new finishes per the General Design Standards requirements.

7. Refer to General Mechanical Design Standards for requirements to provide new exhaust fans at toilet rooms that receive major renovation

8. Refer to General Plumbing Design Standards for requirements to provide new floor drains and hose bibs at restrooms that receive major renovation.

9. Refer to General Electrical Design Standards for requirements to electrical service receptacle and lighting at restrooms that receive major renovation.

U. Existing Flooring

1. Replace resilient flooring and carpet where determined to be necessary or to meet the project requirements. Remove existing flooring completely; do not go over existing flooring with new.

2. Comply with the flooring requirements of the General Design Standards.

3. For existing slabs with moisture issues, notify District of any high moisture areas or other concerns prior to specifying flooring.

V. Existing In-wall Cafeteria Tables and Benches

1. If required by the project, replace existing tables and benches with the same number of tables and benches. Verify with the manufacturer if the existing pockets can be retrofitted with new tables and benches. Replace existing pockets if necessary.

W. Existing Custodian Closets

1. Provide new FRP wall panels on walls from floor to ceiling.

2. Evaluate existing ventilation and repair or replace as necessary.

3. Configure room to accommodate cleaning product dispenser rack with hose bib directly above mop sink.

4. Reconfigure door to swing-out, not into the room.

X. Lockers

1. Evaluate the condition of the existing athletic and kitchen lockers and make recommendations on repairs versus replacement. Note that no student hallway lockers are to be provided. Review with District if student hallway lockers are to be removed.

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IV. Structural Items for Renovation Projects

A. Perform structural analysis of buildings and prepare a report including photographic documentation and recommendations and order-of-magnitude costs to implement any recommendations. Incorporate findings into the Field Report due at the end of the Schematic Design phase and update as necessary in subsequent submittals.

B. Coordinate patch and repair work with District Representative for all verification work that requires removal of finishes to expose existing framework. District Maintenance staff may be available accompany and assist investigative work on existing buildings; please provide two to three months of notice prior for coordination.

C. Confer with the designated District Representative to establish scope of work and budget.

D. Prepare preliminary plans or narrative describing scope of work and confer with the designated District Representative and once agreed to, review with DSA proposed work.

E. Coordinate with the Architect to determine structural members that may be altered, or for additional loads on structural members, that are proposed for the renovation.

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V. Mechanical Items for Renovation Projects

A. In general, the majority of the criteria above shall apply however in the case of renovation projects, the need for a site specific investigation is critical. Often, the aging of equipment and efficiency cannot be determined from a cursory physical observation, and unless the scope of services requires in depth investigations such as destructive testing, data logging, air flow testing and the like, designers will need to spend more time with the maintenance and operations staff, coordinated through the Designated District Representative in establishing the parameters of the scope of existing system upgrades and equipment replacement. Multiple meetings will be required. Incorporate findings into the Field Report due at the end of the Schematic Design phase and update as necessary in subsequent submittals.

E. Meet with designated District representative to help develop phasing schedule and coordinate system design for construction phasing requirements. The goal is to minimize impact to school operations and allow for functioning systems during construction.

F. Review mechanical as-built drawings, conduct independent site investigations and evaluate existing conditions.

G. Where compromises of the standards are needed due to scope limitations, cost, feasibility of installation due to existing conditions, it shall be discussed with the District and agreed to in writing, including submitting Variance Requests as required

H. Design shall respect phasing of the work that may be required to keep the facility in full or part operation.

VI. Plumbing Systems for Renovation Projects

A. Site Infrastructure

1. When required by the scope statement, replace water, sewer and gas lines in their entirety.
2. Specify a seismic shut-off valve if not already existing on the gas service to each building. Coordinate with architect the required protective cage.
3. For renovations, the Design Professional is to review plumbing as-built drawings, conduct independent site investigations and evaluate existing conditions. Incorporate findings into the Field Report due at the end of the Schematic Design phase and update as necessary in subsequent submittals.

B. Building Infrastructure

1. Revise drinking fountains, sinks, lavatories, urinals and toilets as required on the architectural plans to accommodate disabled access. Indicate requirements to tie-in new fixtures to existing plumbing and address new and existing fixture carriers. Coordinate locations and extent of architectural finish patching requirements with architectural plans.
2. Maintain hot and cold water locations where existing.
3. Provide hot water to Kitchens, Nurses Offices, Staff Lounges, Showers, and Art Rooms. Provide hot water to teachers' demonstration table in Science Labs.
4. Water Heaters:
    a. Replacement water heaters shall be gas-fired, instantaneous type tankless, except where gas is not available, or in cases of small load or remote location which warrants small under counter tank type electric water heaters. Tank type water heaters may be used in kitchens or locker rooms where instantaneous type cannot provide an adequate supply. Water heater must be sized to fit through a three-foot doorway.
    b. The sizing of domestic water heaters for locker rooms shall be discussed with the District. The District may elect to apply a diversity factor to the hot water demand calculations, thereby limiting water heater size.
    c. If the existing water heater is to remain, evaluate the installation and require modifications to the existing equipment for code compliant installation.
5. Consult with scope statement if there is a need to replace any of the existing building's infrastructure. Galvanized piping should always be replaced.
6. Replace piping, in walls and below the slab in a major restroom remodel. Vents through roofs may be reused if in good condition.
7. Coordinate any increase demand for gas, water, and sewer capacity with local utility companies, and confirm available gas and water pressures.

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VII. Electrical Items for Renovation Projects

A. General Electrical Renovation Notes

1. The general building design requirements apply to renovations projects.
2. Prior to starting design, meet with the District's Maintenance and Operations Department and review existing electrical conditions and ongoing problems at site.
3. Review electrical as-built drawings, conduct independent site investigations and evaluate existing conditions of power equipment including switchboard, panels, transformers, and feeders. Incorporate findings into the Field Report due at the end of the Schematic Design phase and update as necessary in subsequent submittals.
4. Review scope statement and propose additional scope that may be determined necessary with designated District Representative and the Maintenance and Operations Department prior to starting Construction Documents.
5. Meet with designated District Representative to help develop phasing schedule and coordinate system design for construction phasing requirements. The goal is to minimize impact to school operations and allow for functioning systems during construction.
6. When new equipment is replacing existing, locate equipment in an area that will allow existing equipment to remain in operation until construction is complete.
7. If existing MDF is being relocated, provide pathway from new MDF to the MPOE location for voice, data and cable television utility provider. Additionally, if an MPOE move is planned then pathway will have to be from the new MPOE location (new MDF) to the street. Coordinate exact requirements with utility provider.
8. Where new equipment is added or replaced in existing electrical, MDF, or IDF rooms, verify that adequate air conditioning or ventilation is provided to maintain the appropriate temperatures required to support all equipment in the room.

B. Renovation Site Service

1. Determine if service upgrade is necessary to accommodate current loads and new loads per the renovation scope. If an upgrade is necessary, specify a minimum 2,000 Amp service. Increase size of service if necessary to accommodate design loads plus future loads of master planned additions.
2. If a new site service is necessary, site primary service design and location must be coordinated with and approved by Southern California Edison (SCE). Final SCE commitment requirements shall be incorporated into project requirements prior to bid and written approval obtained from SCE. Verify availability of voltage and phase.
3. Locate new transformer and gear adjacent to the existing to minimize power outage during switchover. Specify short circuit protection for existing panels to meet new A.I.C. requirements.
4. Special attention should be paid to aesthetic considerations of the transformer and

switchgear replacement. Obtain approval of electrical service location from designated District Representative prior to system design. Locate switchgear and transformer in a fully secure utility yard with concrete housekeeping pad. Service conductors shall be routed to avoid pathway and common areas.

C. Renovation Power Scope

1. Refer to scope statement for site needs to address existing power problems such as grounding, panel load balancing and services to existing and new equipment such as computers, office equipment, vending machines, and kitchen appliances.

2. Specify dedicated power to fire alarm, telecommunication system, data equipment including servers, security system, HVAC equipment and other specialty equipment such as photo copiers and food service equipment.

3. Specify new distribution panels at each building to accommodate new, existing and future power requirements. Specify new feeders in new conduits sized to accommodate anticipated future loads. Specify replacement of existing branch circuitry.

4. Specify fully skirted surface mounted panels only. Locate in electrical rooms.

D. Power Distribution on Renovation Campuses

1. Conduits shall be routed in concealed, accessible, attic spaces wherever possible. Minimize rooftop conduits. When possible feed new rooftop equipment under curb. Conduits routed under the overhangs or under canopies shall be clustered with conduits on common supports. Limit use of underground conduits for site service electrical and to service buildings that do not have connecting canopies or overhangs.

2. Do not use exposed conduits in interior applications except for corridors. In major renovations, conceal conduit in walls and ceilings. Only when unavoidable, utilize surface mounted raceway.

E. Renovation Campus Surge Protection

1. Required external TVSS for existing main switchgear panels to protect system from external surges.

F. Renovation Campus Grounding

1. Conductors: Install insulated, green equipment grounding conductor in feeder and branch circuits, including lighting circuits. Separate neutral conductor from electronic equipment. Install insulated, green conductor for grounding in conduit or raceways. Use of conduit as ground is not permitted. Provide grounding bus bar in the MDF room with a connection to the main building ground (dirt).

G. Renovation Power and Data Requirements:

1. The following is the District's goal; however, due to differing existing conditions the actual design may vary.

2. Engineer circuits to service no more than five non-computer, duplex receptacles on one circuit.

3. Refer to the Technology and Low Voltage Standards requirements.

H. Renovation Campus Lighting

1. General notes

   a. Replace existing lighting with new energy efficient light fixtures per the General Design Standards.

   b. Where possible, reuse existing conduits and boxes. Replace conductors.

   c. Install new light fixture in lieu of removal and reinstallation; provide new lens if fixture replacement is not feasible.

2. Controls

   a. Design lighting control panel to provide sweep shut off in assembly areas, reception, hallways, kitchens and stage. Specify a separate time clock control for the gyms.

3. Exterior Lighting

   a. Exterior light fixtures shall be evaluated and upgraded where deficient.

   b. Replace existing exterior lighting with new energy efficient heavy-duty and vandal resistant fixtures.

   c. Replacement system to provide two separate lighting functions:

   d. Function A – Provide general lighting of entire exterior of building compound, primary walkways and parking lots. Design exterior lighting system to achieve a minimum maintained 1.5- foot candle.

   e. Function B – Provide lighting for security cameras. These fixtures should provide lighting throughout the campus and for the surveillance cameras. This lighting is to be motion detected, photocell-controlled and coordinated with function to lighting controls.

   f. Exterior lighting to be designed to minimize light pollution and avoid overspill to adjacent properties.

   g. Provide 365-day astronomical time clock and photocells for exterior lighting.

4. Interior lighting

   a. Provide new A and B switching if existing lighting is to remain. Provide A and B switching for lighting in classrooms to be upgraded. Existing A and B switch lighting to be maintained.

5. Emergency Lighting:

   a. Egress lighting shall derive its power from the Emergency Generator. No bug-eye lights or individual battery packs will be allowed. In the case where an emergency generator does not exist a centralized inverter system with “AGM” type batteries shall be used. Coordinate with the District Technology Representative.

6. Emergency generators are required at sites. Provide a generator of sufficient capacity for the items below found on the site, but only make electrical connections to the portions being remodeled. Load banks at 75% minimum capacity. In case of power

failure, the generators shall maintain power to the following items:

a. Emergency egress lighting.

b. Minimal Administrative office lighting.

c. Main Distribution Frame (MDF)

d. Telephone head-end equipment.

e. Fire alarm panel.

f. Security systems

g. Nurses' Room power receptacles (for life-saving medical equipment and refrigerator)

h. Booster pumps serving fire sprinklers (only if pumps are required).

i. Air conditioning systems required to maintain the equipment listed above.

7. General Technology and Low Voltage Systems

a. Site verify all existing pathway and document existing conditions to be able to utilize existing pathway whenever possible.

b. Coordinate the design of new low voltage pathways with existing pathways.

c. Determine if existing cabling is in use and must remain or if it is abandoned and can be removed. Include the removal of abandoned cables and raceway in the demolition plans.

d. Accommodate equipment space and power requirements for each system

8. Digital Intercom/Clock and Speaker System

a. Corridors: If existing ceiling is hard lid, speakers shall be wall mounted.

b. In classrooms, locate the surface mounted clock and speaker adjacent to the existing clock unless the existing clock is located at the front of the classroom. Provide a cover plate over existing junction box.

9. Fire Alarm System

a. Show the location of all existing fire alarm devices to be removed on the demolition drawings.

b. Reuse existing dedicated conduit where possible; pull new cable in all cases.

10. IDF Wall Mounted Cabinet: Must be approved by the District Representative.

a. Locate in electrical rooms or teacher work rooms. Coordinate location of cabinet with District Representative. Do not locate in classrooms unless approved by District.

b. Provide 20 Amp dedicated electrical receptacle located 6- foot 1 inch above IDF cabinet coordinate location of electrical at the center of the IDF cabinet.

c. Provide two, 2-inch conduit stubs and utilize knock outs for stubs.

11. Intrusion Detection System

a. Confirm main controller has expansions for additional zones. If the zone count is higher than twelve (12) installation of a new controller is required.

End of Part

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PART 4 – SPECIAL PROJECT DESING STANDARDS

I. Modular buildings

A. General Building Information

1. These standards are not meant to dictate scope, but rather clarify the requirements when included in the project specific scope statement.
2. The District will purchase and arrange for delivery of the modular buildings. The Design Professional must prepare drawings that incorporate the modular units into a fully functional building.
3. The Design Professional is encouraged to improve on the aesthetic of the modular building via finishes, screens, and well-designed support spaces.
4. When using modular construction, the Design Professional is responsible for complying with the District's standards and providing the support spaces: stairs, restrooms, custodial rooms, offices, etcetera required by the project scope.
5. The Design Professional is to work with the modular manufacturer to determine what support spaces will be provided as modular construction, and what spaces must be constructed.
6. The Design Professional must prepare the Drawings to clearly define the work to be performed by the modular supplier and the work required by the General Contractor.
7. The Design Professional shall request and obtain from the District the necessary site utility as-built information and Geotechnical reports.
8. Modular units will require HVAC, power, fire alarm, phone, data, public address, television, security and energy management.
9. Provide drinking fountains and sinks when required by the project scope.
10. Add room identification signs to back of portables. Use District Design Standards for exterior room signs. Only identify room number.

B. Site Issues

1. If existing portable building(s) are to be demolished, the building(s) must be demolished onsite and not relocated offsite to be demolished. Comply with the Facility Design Standards for site requirements.

C. Agency Approval

1. DSA requires the modular unit drawings for approval, and asks that the drawings be listed in the set's index. Request the drawings from the manufacturer selected by the District.
2. The District will only use modular buildings whose system has a current PC (DSA pre-approval) number.

3. Modular buildings are Type V-N buildings and must comply with the CBC requirements for this type of construction. Rated modular buildings are available but are not encouraged.

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II. Relocatable buildings

A. General Building Information

1. These standards are not meant to dictate scope, but rather clarify the requirements when included in the project specific scope statement.
2. The District will purchase and arrange for delivery of the relocatable buildings. The Design Professional must coordinate the site work with the buildings' manufacturer.
3. The District standard size is 24 foot by 40 foot, but may be 30 foot by 32 foot to accommodate site constraints with specific District approval.
4. Relocatable buildings have overhangs over the ramp, and sometimes on other sides. The Design Professional is to confirm that the specific selected units do not interfere with trees, other buildings, or fire access.
5. The District provided buildings' roofs can be sloped one way or in two directions. The Design Professionals are to confirm roof drainage and coordinate building location and site drainage.
6. Units are to have rain gutters. The Design Professional is to confirm if the District provided building have gutters or if they must be added as a part of the work.
7. Relocate downspouts as needed to assist drainage and tie into the storm drainage system when possible.
8. Doors are located on the short side of the unit and can be on the right or left side. The Design Professional is to coordinate the ramp designs and necessary accessibility requirements.
9. The Design Professional shall request and obtain from the District the necessary site utility as-built information, site survey and Geotechnical reports.
10. Units will require HVAC, power, fire alarm, phone, data, and public address. In addition, permanent units will require television, security and energy management. The preferred method of connection is to tie into the site's existing systems.
11. Provide sinks, drinking fountains and bottle filling stations when required by the project scope.

B. Relocatable Building Ramps

1. Relocatable Buildings with recessed foundations shall be designed to avoid the use of ramps.
2. Relocatable Buildings come with pre-fabricated ramps. A ramp extension is needed in all cases to reach grade
3. The handrail extensions at the base (that come with the ramp) vary from 12 inches to 24 inches. These may have to be modified in order to extend the ramp, especially if the ramp turns 90 degrees.

4. Ramp extensions are to be asphalt. Extend the building ramp and handrails instead of adding a landing directly to the base of the building ramp.

5. Include elevation requirements for the ramp and landings. Do not design accessibility to code maximum to accommodate some construction tolerances.

C. Installation

1. Design Professionals to coordinate the necessary plumbing and electrical requirements for the specific unit provided by the District. The technology systems need to be coordinate with campus-wide systems. Refer to technology standards sections and standard specifications.

2. Provide a condensate dry-well for each HVAC unit. Route condensate piping underground to the sleeved drywell and provide with labeled metal cover.

3. If the building is designed to be recessed, code conforming foundation venting needs to be design by the Design Professional.

D. Site Issues

1. In addition to the below items, comply with the General Site Requirements for all building types included in these Facility Design Standards.

2. Locate the units 24-inches apart. If the units are being located back-to- back, provide a secure chain link fence enclosed area between the buildings with storm drains. The building(s) are to be located a minimum of five-feet from chain link and six-feet from solid fence for maintenance purposes.

3. Between the buildings, include a solid plywood closure panels to match the adjacent buildings at the front of the buildings. In the rear of the buildings provide a chain link enclosure with gate. The wall mounted HVAC units can be a hazard when they are near a path of travel. Provide fencing to both secure the HVAC units and prevent people from running into the units.

4. The building pad should extend three to five-feet beyond each side of the unit. This allows the installer to use jacks to move the units into place.

5. Locate the buildings to minimize the impact to site drainage and design the necessary site grading revisions to avoid any drainage under the building(s) or standing water around the building.

6. Plans should show the finish grade at each corner of the units. Be sure to create drainage between the units and do not let standing water accumulate between the ramp extensions.

7. Provide a minimum of 3-inch asphalt paving over a four-inch (4”) aggregate base under the building(s) on compacted grade. Be sure to note on the site plan that asphalt is under the unit, a note is needed because the asphalt will not appear on the plans.

8. Install two ground rods so that the ground rod testing is not required.

E. Agency Approval

1. Design Professional to request the DSA pre-approved, relocatable drawings for incorporation into the DSA site approval plans.

2. The District will only use relocatable buildings with a current PC (DSA pre-approval) number.

3. Design Professional to coordinate the scope of work with the building mover and site contractor clearly indicating on the bid documents the scope of work and coordination requirements.

4. Relocatable buildings are Type V-N buildings and must comply with the CBC requirements for this type of construction. The maximum number of 24 by 40 relocatable buildings less than twenty-feet apart is nine. Twenty-foot separation is needed on all sides of the unit group.

5. Design Professional to obtain local fire jurisdiction acceptance of the proposed site plan prior to finalizing the construction documents. Local fire will require water flows at the fire hydrants. Request the fire flows, from the local water company, well in advance of submitting to the local fire jurisdiction.

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III. Interim Housing

A. These standards are not meant to dictate scope, but rather clarify the requirements when included in the project specific scope statement.

B. The preferred solution for interim facilities is to use existing campus spaces. Design Professional to coordinate with the designated District Representative for Site Committee review and coordination with the Planning group for possible ability to relocate students to a nearby campus.

C. Renovation projects that affect classrooms, kitchens, gyms and other student use spaces will displace teachers and students. It is the Design Professional's responsibility to develop plans for interim housing.

D. The Design Professional shall develop phased interim housing plans for projects that require phased construction.

E. Summer Break

1. Work that is disruptive to the entire campus, such as underground utilities, fire alarm upgrades, or play field and sports field refurbishment should be scheduled for summer months.

2. If necessary, divide projects into smaller parts in order to take advantage of the summer holidays. The parts should be limited to 45 calendar days of work and be planned such that the contractor can mobilize and submit bonds one month prior to the last day of school.

3. Confirm with District that the site does not have summer school or special sumer functions.

F. Summer Break

1. Where no other accommodations are available, prepare plans for the installation of relocatable buildings.

2. Relocatable buildings may be available from other school sites, confirm with the District. Verify that relocatable buildings taken from different sites have been closed with certification by DSA.

3. Comply with the LBUSD Design Standards for Relocatable Buildings.

4. Exception: Temporary housing does not have to be located over asphalt.

5. Comply with the LBUSD Design Standards for siting the buildings.

6. Provide all utilities underground. Conduits, conductors, and vaults are to remain for potential future use.

7. Provide restroom relocatable buildings when the existing restrooms will be modernized.

G. Removal

1. Include requirements for removal of buildings at the end of construction.
2. Require removal of fencing, gates, drywells, ramp extensions and utility lines.
3. Require that the paving be repaired and restored to its original extent and to new condition or that planting be replaced in the project area.
4. Restore irrigation system to its original extent and to new condition.
5. Require restriping of parking or playground painted lines.

H. Agency Approval

1. DSA will require review and approval of interim housing, even if only temporary.
2. Design Professional to request the DSA pre-approved, relocatable drawings for incorporation into the DSA site approval plans.
3. The District will only use relocatable buildings with a current PC (DSA pre- approval) number.
4. Design Professional to coordinate the scope of work with the building mover and site contractor clearly indicating on the bid documents the scope of work and coordination requirements.
5. Relocatable buildings are Type V-N buildings and must comply with the CBC requirements for this type of construction. The maximum number of 24-foot by 40-foot relocatable buildings less than twenty-feet apart is nine. Twenty-foot separation is need on all sides of the unit group.
6. Design Professional to obtain local fire jurisdiction acceptance of the proposed site plan prior to finalizing the construction documents. Local fire will require water flows at the fire hydrants. Request the fire flows, from the local water company, well in advance of submitting to the local fire jurisdiction.

IV. Shade Shelters and Other Prefabricated Units

.General Building Information

A. These standards are not meant to dictate scope, but rather clarify the requirements when included in the project specific scope statement.

B. The District will consider the use of pre-fabricated structures (e.g. ticket booths, athletic equipment storage buildings, bleachers) with specific approval. The Design Professional is to provide a cost analysis to the designated District Representative that show the pre-fabricated unit is more cost effective than a custom-built unit for consideration.

C. The structures must complement the site and the design of the campus.

D. Prepare a site plan showing the structure's locations. Site the structure using the LBUSD site design standards.

1. Ensure that the structure does not block drainage patterns on the site, and that primary drainage swales do not run through the structure.

2. Ensure that the structure has a path of travel to the primary access point of the campus and is fully accessible.

3. Structures of any type must comply with the CBC for separation between building, exiting, access, and fire resistance. Provide a code analysis with each structure.

   a. Use metal roofed units or other roof types. Fabric roofs are not acceptable. Provide information for District approval of other roof types.

   b. Determine if the District will need water, lighting, power, data or other utilities at the structure.

   c. The Design Professional is to coordinate the scope of work with the manufacturer and site contractor clearly indicating on the bid documents the scope of work and coordination requirements.

   d. The Design Professional is to request the DSA pre- approval (PC) relocatable drawings from the manufacturer, when applicable for incorporation into the DSA site approval plan set. Please note that structure does not have to PC approved.

   e. The manufacturer's drawings are required for approval. In most cases, the drawings offer options, typically regarding sizes and footing types. Using "X" lines, mark-out the options that are not used. Do not alter the manufacturer's drawings in any other way.

4. Shade Structures

   a. The District standard shade structure is 10-feet high clear by Americana Outdoors Commercial Shelters (https://americana.com/products/commercial/shelters) or District Approved Equal, all steel structures with concrete footings. The size of the shelter to be dictated by the campus type, size, and student capacity.

b. Other acceptable manufacturers for shade structures include M Bar C Construction, Inc.

c. Provide a minimum of one (1) power outlet at each shelter

d. Provide a ¾ inch water line and keyed hose bib at each shelter. Strap hose bib supply line to shelter column.

e. Provide 4-inch-thick concrete slabs below open shelters with control joints between each column. Drain slab to existing site drainage features.

f. Provide powder coat frame including the premium zinc rich primer.

5. Agency Approval

a. Submit complete construction documents, including calculations to DSA for the structure. The drawings should contain the DSA pre-approval number, when applicable.

b. DSA requires the structure's drawings for approval and asks that they be listed in the set's index. Request the drawings from the manufacturer selected by the District.

c. Sign the manufacturer's drawings per the requirements of DSA IR A-18.

d. The Design Professional must obtain local fire jurisdiction acceptance of the proposed site plan prior to finalizing the construction documents. Local fire may require water flow testing at the fire hydrants. Request the fire flow testing, from the local water company, well in advance of submitting to the local fire jurisdiction.

V. Marquees

A. These standards are not meant to dictate scope, but rather clarify the requirements when included in the project specific scope statement.

B. The District uses electronic message for their marquees at schools.

C. The display board is to be double-sided (when viewable from two sides), full-color, and electronic. Single-sided marquees are acceptable if located appropriately. Wall-mounted displays are acceptable in new construction projects as part of the project construction contract.

D. Locate the marquee in front of the school viewable by students, staff, parents and passing traffic.

E. Elementary School Displays:

1. The overall height of the marquee shall be less than eight feet tall.

2. The overall size of the display board including the fixed sign cabinet, shall be a minimum of six feet by three feet high.

F. Middle and high School Displays

1. The bottom of the display board must be at ten-feet above grade.

2. The overall size of the display board, not including the fixed sign cabinet, shall be a minimum of eight-feet wide by three-feet high.

3. Provide column supports and reduce the surface area of the marquee base.

G. Sign must not obstruct views of pedestrians or traffic on the streets, sidewalks, or driveways.

H. Sign must not obstruct views of pedestrians or traffic on the streets, sidewalks, or driveways.

I. Sign must be located for easy access by maintenance and repair crews.

J. Divert irrigation spray away from the signage.

K. Coordinate the colors of the marquee and its supports with building's colors or school colors and architectural style.

L. City Approvals: The Design Professional must comply with the requirements of the City's (in which the sign is located) sign ordinances. However, a permit or City review is not required.

M. The Design Professional is responsible for the sign mounting system, structural calculations, electrical and low voltage requirements.

N. Signs must be approved by DSA, unless the total height of a free-standing sign is below eight-feet tall. Where possible, utilize PC-approved marquee designs, however marquees should be incorporated with overall project scopes of work for new construction and major, campus-wide modernizations.

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PART 5 – PRODUCT SYSTEM AND MATERIAL ANALYSIS

A. The key purpose in the development of these metrics is to allow the District to compare similar products and to determine the product that offers greater value. One of the goals of this analysis is to create projects that utilize capital improvement funds resulting in lower operational, maintenance and replacement costs; allowing accrued savings to increase available general funds. The Long Beach Unified School District recognizes that with advances in technology materials and systems there will be opportunities to include items not covered in these standards.

B. The discussion that surrounds the consideration of these items often trends toward the anecdotal and the intuitive rather than conforming to a set of rigorous and consistent criteria. The purpose of this section of the Facility Design Standards is to afford stakeholders in the design process a consistent set of tools that can be used to measure these items as they arise and to create an "apples to apples" assessment of whether they contribute to the goals of the District Facilities Program.

C. Circumstances that may give rise to the need to utilize these tools include but are not limited to the following:

1. A new product or system proposed by the Design Professionals for inclusion in a project in design.
2. A submittal from a contractor that is being proposed as an equal to the specified product.
3. A new product or system proposed by a manufacturer for potential future inclusion in the District's Design Standards.
4. A replacement product or system to replace a discontinued product or system.

D. The criteria to be utilized in the analysis fall into two categories. The first are a series of "go or no go" issues that may override further analysis. These include the following:

1. Technical complexity of running and maintaining the system or product. It may be simply unfeasible to have the District keep a very sophisticated system running regardless of its energy or resource efficiency. The resources that can be dedicated by the District to running or maintaining a system or product are limited. This includes expectations regarding skill and training and the frequency with which these systems need to be maintained. The overall impact on the Maintenance and Operations departments will be considered in the decision.
2. Availability of repair, replacement parts and outside service. The District has a goal to install systems and products that have readily available parts, can be repaired easily and, if outside service is need, can be done within a short time.
3. Stability of the Manufacturer. An important part of the analysis process is an understanding of the probability that the manufacturer and support system will be in place for the life of the product. While there is not a hard and fast rule for what determines success; it is critical for the District to have some assurance that the company will be able to sustain the system over time.

4. Does the system or product contribute to the District overall sustainability goals?

E. The second series of tools are analytically based and will be used to establish the overall benefit of inclusion of the material or system in the project. These include the following:

1. Life Cycle Cost Analysis. Life-cycle cost analysis (LCCA) is a method for assessing the total cost of inclusion of a system or product in the facility. LCCA considers the cost of acquiring, owning and disposing of the system at the end of its useful life.

a. The costs to be considered in the analysis are as follows:

i) Initial costs- Purchase, acquisition, and construction costs.

ii) Fuel costs or cost of other consumables to run the system.

iii) Operation, maintenance and repair costs.

iv) Replacement costs.

v) Residual values- Resale or salvage values or disposal costs.

vi) Finance costs (Lease payments, interest, and etcetera).

vii) Non-Monetary benefits or costs.

2. Parameters for Present-Value Analysis include the following to create a consistent base for the analysis:

a. Discount Rate. Future costs and savings should be discounted to the anticipated date of the completion of the project and District utilization of the completed construction.

b. Cost Period. The study period should be the same for all alternatives considered. This should begin at the date which the system will be taken over by the District.

c. Discounting Convention. Savings that recur annually should be taken from the end of the calendar year in which they are incurred.

d. Inflation Rate. Since future inflation is difficult to ascertain the analysis will consider values to be constant without the effects of inflation unless directed otherwise by the District.

3. The Life Cycle Cost Calculation shall be analyzed as follows:

a. LCC= I + Repl – Res + E + W + OM&R + O

i. LCC= Total LCC in present value (PV) dollars of a given alternative

ii. I = PV investment costs (if incurred at the base date, they need not be discounted)

iii. Repl = PV capital replacement costs

iv. Res = PV residual value (resale value, salvage value) less disposal costs

v. E = PV of energy costs

vi. W = PV of water costs

vii. OM&R = PV of non-fuels operating, maintenance and repair costs

viii. O=PV of other costs (e.g. contract costs for support etc.)

F. Return on Investment (Payback Period)

1. As a non-profit organization the concept of return on investment operates on a different level than business. Since there is no alternative use of capital to generate income, the key element in this analysis is the concept of when a particular material or system will "pay for itself". A mitigating element in this analysis is whether the useful life of the system is longer than the payback period. If a system has a payback of ten years with a useful life of 8 years it is not a viable investment.

2. The Payback or Return on Investment Calculation shall be analyzed as follows:

a. Payback = Total Annual Maintenance Costs + Cost for Purchase and Installation / Total Annual Savings incurred

b. Savings may include energy and other consumable resources, ongoing maintenance costs, other operations costs and miscellaneous costs

c. The savings and costs do not have to be inflated or discounted from or to present values. Increases in future resource costs can be factored in only when approved by the District.

d. The total useful life of the product must be noted in the analysis and compared to the payback period at the conclusion of the analysis.

G. It is the Design Professional's responsibility to develop an analysis for assessment of products or systems that are not included in the District's Facility Design Standards.

H. During the Bidding and Construction phases the Design Professional must analyze the products or systems using information provided by the Construction Team. The information required for the analysis must be included in, and required by, the Project Specifications to ensure consistency.

I. Other considerations that will enter into the ultimate decisions regarding product preference include how effectively the product supports the District's green design goals and the cradle-to- cradle considerations in its manufacture and ultimate disposal.

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PART 6 – COLLABORATIVE FOR HIGH PERFORMANCE SCHOOLS (CHPS)

The Long Beach Unified School District has adopted a Board Resolution on Sustainability and Design and Construction of High Performance Schools that has been accepted by CHPS and is on file. The goal of that resolution is to create safe and healthy school environments that enhance student achievement and provide improved teacher and staff retention and effectiveness.

Each design team for every project within the District shall utilize the CHPS Scorecards in the appendix to guide the development of their project. Projects that are eligible for CHPS Certification are not required to be CHPS certified, but are to be designed according to CHPS guidelines. The following summarizes the highlights of the District's commitment to this goal:

A. The District requires that all projects meet the minimum standard as determined by California High Performance Schools to be designated as a CHPS Certified School.

B. A benefit of meeting the CHPS Designed School criteria is that the project will then also meet the requirements of the California Green Building Code.

C. Scorecards with District recommended points are provided as an appendix. The points indicated on the sample scorecard exceed the minimum number of points required to meet the designation as a CHPS Designed School. It is the District's goal that the design team maximizes the number of points achieved within the parameters of project budget, physical constraints and the project schedule.

D. During the early stages of each project the design team shall develop a preliminary CHPS Scorecard utilizing the attached District scorecard as a tool for discussing approach and project technical and planning priorities with District staff. This is the opportunity to discuss building systems, site design decisions, and technical constraints, to ensure that the direction being developed by the design team is consistent with the District staff goals and standards.

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PART 7 - ACRONYMS

ADA	Americans with Disabilities Act
AEIC	Association of Edison Illuminating Companies
AFCI	Arc-Fault Circuit Interrupter
AGM	Absorbed Glass Mat
ANSI	American National Standards Institute
ARI	Air-Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASTM	American Society for Testing and Materials
AV	Audio Video
AWG	American Wire Gauge
AWI	Architectural Woodwork Institute
AWWA	American Water Works Association
BIM	Building Information Modeling
CAB	Crushed Aggregate Base
CAD	Computer-aided Design
CAFM	Computer-aided Facility Management
CAL-EPA	California Environmental Protection Agency
CATV	Cable Television
CBC	California Building Code
CCTV	Closed Circuit Television
CD	Construction Documents
CDE	California Department of Education
CEC	California Energy Commission
CEQA	The California Environmental Quality Act
CFCI	Contractor Furnished, Contractor Installed
CFC	Chloro Fluro Carbon
CFM	Cubic Feet per Minute
CHPS	Collaborative for High Performance Schools
CMU	Concrete Masonry Unit
CPTED	Crime Prevention through Environmental Design
CRI	Color Rendering Index
CRR	Corrosion Resistance Ratio
DD	Design Development
DSA	Division of the State Architect
DTSC	Department of Toxic Substance Control
DVD	Digital Versatile Disc
DWR	Department of Water Resources
EIFS	Exterior Insulated Finish System
EMS	Energy Management System
EPA	Environmental Protection Agency
ET	Evapotranspiration
FACP	Fire Alarm Control Panel
FDC	Fire Department Connection
FDS	Facility Design Standards
FPM	Feet per Minute

FPS	Feet per Second
FRP	Fiberglass Reinforced Plastic
FSC	Forest Stewardship Council
GFEP	Ground-Fault Equipment Protection
GPM	Gallons per Minute
HCFC	Hydro Chloro Fluoro Carbon
HPI	High Performance Initiative
HVAC	Heating, Ventilation, & Air Conditioning
ICC-ES	International Code Council - Evaluation Service
ICEA	Insulated Cable Engineers Association
IDF	Intermediate Distribution Frames
IEEE	Institute of Electrical and Electronics Engineers
ISA	Industry Standard Architecture
KV	Kilovolt
LAN	Local Area Network
LBUSD	Long Beach Unified School District
LCCA	Life-Cycle Cost Analysis
LED	Light-emitting Diode
MC	Metal Clad
MDF	Main Distribution Frame
MERV	Minimum Efficiency Reporting Value
MIS	Main Information System
MPOE	Minimum Point of Entry
NEMA	National Electrical Manufacturer Association
NFPA	National Fire Protection Association
OFCI	Owner Furnished Contractor Installed
OFOI	Owner Furnished Owner Installed
OPAC	Online Public Access Catalog
OPALS	Ogren Plant-Allergy Scale
OPSC	Office of Public School Construction
PA	Public Address
PC	Pre-Checked
PIV	Post Indicator Valve
PIR	Passive Infrared
POS	Point of Sale
PSF	Pounds per Square Foot
PSI	Pounds per Square Inch
PSIG	Pounds per Square Inch Gauge
PV	Photovoltaic
PV	Present Value (Product System & Material Analysis)
PVC	Polyvinyl Chloride
RAW	Remedial Action Work Plan
SBR	Styrene-Butadiene Rubber
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCRC	Solid Color Reinforced Composite
SDI	Steel Door Institute
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association

SSPC-SP	Society for Protective Coatings, Surface Preparation Standards
SWPPP	Storm Water Prevention Pollution Plan
TCNA	Tile Council of North America
TEFC	Totally Enclosed Fan Cooled
THHN	Thermoplastic High Heat Resistant Nylon Coated
THWN	Thermoplastic Heat and Water Resistant Nylon
TVSS	Transient Voltage Surge Suppressor
UL	Underwriters Laboratory
UPS	Uninterrupted Power Supply
VAV	Variable Air Volume
VCR	Video Cassette Recorder
VOC	Volatile Organic Compound
WAN	Wide Area Network
WDMA	Window and Door Manufacturer's Association
WPA	Wetlands Preservation Act

End of Part

PART 8 – GLOSSARY

Americans with Disabilities Act: A federal law that gives civil rights protections to individuals with disabilities similar to those provided to individuals on the basis of race, color, sex, national origin, age, and religion. It guarantees equal opportunity for individuals with disabilities in public accommodations, employment, transportation, state and local government services, and telecommunications. Website: http://www.ada.gov/

Architectural Woodwork Institute: The Architectural Woodwork Institute (AWI) is a nonprofit trade association founded in 1953. Today, AWI represents nearly 4000 members consisting of architectural woodworkers, suppliers, design professionals and students from around the world. Website: http://www.awinet.org/

California Building Standards Commission: The state government entity to oversee the development of building standards and to publish the California Building Standards Code in Title 24 of the California Code of Regulations. The California Building Standards Commission operates under the authority established by Health and Safety Code, Division 13, Part 2.5, 3 known as the California Building Standards Law. The abbreviation CBSC or BSC is often used to identify the California Building Standards Commission. Website: http://www.bsc.ca.gov/default.htm

California Department of Education: The department oversees funding and testing, and holds local educational agencies accountable for student achievement. Its stated mission is to provide leadership, assistance, oversight, and resources (via teaching and teaching material) so that every Californian has access to a good education. Website: http://www.cde.ca.gov/index.asp

California Department of Water Resources: Manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments. Website: http://www.water.ca.gov/

California Green Building Code: The document is the 11th of 12 parts of the official compilation and publication of the adoptions, amendments and repeal of regulations to California Code of Regulations, Title 24, also referred to as the California Building Standards Code. The Part that is known as the California Green Building Standards Code and it is intended that i t shall also be known as the CALGreen Code. The California Building Standards Code is published in its entirety every three years by order of the California Legislature. The California Legislature delegated authority to various State agencies, boards, commissions and departments to create building regulations to implement the State's statutes. These building regulations or standards have the same force of law and take effect 180 days after their publication unless otherwise stipulated. The California Building Standards Code applies to all occupancies in the State of California as annotated. Website: http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf

California Plumbing Code: Part 5, Title 24, California Code of Regulations. Website: http://www.documents.dgs.ca.gov/bsc/Title_24

City Building Department: Address: 333 West Ocean Blvd., 4th Floor, Long Beach CA 90802 Website: http://www.lbds.info/building/default.asp

City Health Department: Address: 2525 Grand Ave., Long Beach, CA, 90815 Phone: 562.570.4000 Website: http://www.longbeach.gov/health/default.asp

City Publics Works Department: Address: 333 W. Ocean Blvd, Long Beach, CA 90802 Phone: 562.570.6383 Website: http://www.longbeach.gov/pw/default.asp

Collaborative for High Performance Schools Best Practice Manual: CHPS has developed technical resources for schools, districts and practitioners on the design, construction, maintenance and operations of high performance schools. Website: http://www.chps.net/dev/Drupal/node/288

Collaborative for High Performance Schools Scorecard: The CHPS Operations Report Card (ORC) is a program that benchmarks the current performance of existing schools, provides a report card of results and makes suggestions for improvement. The ORC program advances the standard for the maintenance, operation, and improvement of all school buildings – high performance and otherwise. Website: http://www.chps.net/dev/Drupal/node/44

Color Rendering Index: A quantitative measure of the ability of a light source to reproduce the colors of various objects faithfully in comparison with an ideal or natural light source.

Construction Documents: The documents, consisting of Drawings and Specifications, and other documents as defined in the Lease Agreements, to be prepared and/or assembled by Architect with input from Contractor as described herein, to define the Work to be constructed as part of the Project.

Contract Documents: The Preliminary Design/Preconstruction Services Agreement ("Preconstruction Agreement"), the Site Lease, Sublease, and Construction Services Agreements (collectively "Lease Agreements"), together with any exhibits, Drawings, Specifications, Schedules, Performance Bond, Payment Bond, Addenda issued prior to execution of the Preconstruction Agreement or Lease Agreements, applicable environmental documents to comply with District's Mitigation Negative Declaration, other documents listed in either the Preconstruction Agreement or the Lease Agreements, and Modifications issued after execution of the Preconstruction Agreement or Lease Agreements. A Modification is: (1) a written amendment to the Preconstruction Agreement or the Lease Agreements signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by Architect. Unless specifically enumerated in the Preconstruction Agreement or Lease Agreements, the Contract Documents do not include other documents such as bidding requirements (advertisement or invitation to bid, Instructions to Bidders, or sample forms).

Cool Roof Rating Council: An independent, non-profit organization that maintains a third-party rating system for radiative properties of roof surfacing materials. Website: http://www.coolroofs.org/

Crime Prevention through Environmental Design: Crime Prevention Through Environmental Design (CPTED) theories contend that law enforcement officers, architects, city planners, landscape and interior designers, and resident volunteers can create a climate of safety in a community right from the start. CPTED's goal is to prevent crime by designing a physical environment that positively influences human behavior. The theory is based on four principles: natural access control, natural surveillance, territoriality,

and maintenance. NCPC's course helps participants put the theories behind CPTED into action in their communities by designing a hands-on, interactive, two- or three-day basic or advanced training specifically tailored to their community's needs. Website: http://www.ncpc.org/training/training-topics/crime-prevention-through-environmental-design-cpted-

Department of Toxic Substance Control: Is to protect California's people and environment from harmful effects of toxic substances by restoring contaminated properties, identifying and promoting safer ingredients in consumer products, and ensuring stewardship through enforcement, regulation and pollution prevention. Website: http://www.dtsc.ca.gov/

Design Professional: A term to refer to architects; civil, structural, mechanical, electrical, plumbing, and heating, ventilating, and air conditioning engineers; interior designers; landscape architects; and others whose services have wither traditionally been considered "professional" activities, require licensing or registration by the state, or otherwise require the knowledge and application of design principles appropriate to the problem at hand.

District Consultants: Those consultants retained by the District identified in the Project Roster (or later added) who will assist the District in carrying out the Project.

Division of the State Architect: "Division of the State Architect" is the California State agency responsible for checking construction documents for compliance with Title 24, California Code of Regulations, and monitoring compliance on the construction site. The Division of the State Architect also approves inspectors on all public school projects.

DSA Class I Inspector: May inspect the following:

- Buildings or additions of 2,000 square feet or greater that utilize materials other than wood-frame shear walls (for example: masonry/concrete shear walls, steel brace frames, concrete, or steel moment-resisting frames) as the primary lateral load-resisting system.
- Substantial structural alterations to the gravity and/or lateral load-resisting system of the building types described above.

DSA Class II Inspector: May inspect the following:

- Buildings or additions over 2,000 square feet that utilize wood-frame shear walls as the primary lateral load-resisting system. Projects may be single or multi-level. The project may contain incidental masonry, concrete and/or structural steel construction (e.g. gravity load carrying columns and beams). Buildings may have isolated exceptions to the lateral load-resisting system, such as a steel brace frame at one location in the structure.
- Buildings or additions of less than 2,000 square feet in floor area that have primary lateral load-resisting systems utilizing concrete, masonry or steel construction. A single-story masonry building with a regular configuration (see C.B.C. Sec. 1629A.5.2), a floor area of less than 7,000 square feet, and a wood-frame roof structure may be considered to be a Class 2 structure.
- Two-story relocatable buildings (on-site construction) utilizing shop-fabricated building frames.

- Alteration, modernization, and reconstruction projects that exceed the limitations of the Class 3 scope of work, but do not include substantial alterations to structural systems of concrete, steel or masonry.

- Non-building structures that exceed the limitations of the Class 3 scope of work (signs, poles, bleachers, walls, fences, retaining walls, etc.).

DSA Class III Inspector: May inspect the following:

- Buildings or additions of wood-frame, single-story construction, with conventional (spread footing) concrete foundations and a total floor area less than 2,000 square feet. Structures must utilize wood-frame shear walls as the primary lateral load-resisting system. The project may include isolated steel or concrete elements (e.g. steel or concrete columns).

- Structural alteration projects limited to wood-frame, single-story construction. When deemed appropriate by DSA, alterations to (or addition of) isolated steel, masonry or concrete elements may be included in Class 3 projects. Alteration projects involving significant changes to the lateral load-resisting system may be classified as Class 2 projects.

- Alteration and modernization projects that are primarily non-structural, such as electrical, mechanical, plumbing, disabled access features, and site improvement work.

- Most non-building structures such as signs, poles, bleachers, walls, fences, retaining walls, etc.

DSA Class IV Inspector: May inspect the following:

- Site installation of pre-manufactured, single-story, single-story relocatable buildings.

DSA Pre-Approval Number (DSA Pre-Check (PC) Approval Process): DSA PROCEDURE #07-01 The goal of the PC Approval Process is to streamline DSA plan review by providing a procedure for approving the design of commonly used structures prior to the submittal of plans to DSA for construction projects. The PC Approval Process allows designers to incorporate designs for structures that have already been "pre-checked" by DSA into their plans for actual site-specific construction projects. PC approval is one prerequisite for "Over-the-Counter" (OTC) review; see Policy PL 07-02 for additional OTC requirements. The purpose of this procedure is to describe the DSA requirements for the submission of the design of a building or structure for pre-check (PC) review and the procedures DSA uses to approve such PC designs.

Energy Management System: The control system that monitors the environment and energy usage in a building and alters equipment operation to conserve energy while providing occupant comfort.

Interim Housing: The intermediate period of housing assistance that covers the gap between sheltering and the return of disaster victims to permanent housing.

Office of Public School Construction: "Office of Public School Construction" is the California State agency responsible for apportionment, disbursement and monitoring of state provided school district capital improvement funds.

Ogren Plant Allergy Scale: A scale that measures the allergy potential of all garden and landscape plants. The new trademarked scale is called OPALSTM, or Ogren Plant Allergy Scale. The scale uses a simple, easy-to-use 1 to 10 ranking system. The safest, least allergenic plants rank at 1, and the worst, most allergenic at 10.

Photovoltaic System: A system that uses one or more solar panels to convert sunlight into electricity. It consists of multiple components, including the photovoltaic modules, mechanical and electrical connections and mountings and means of regulating and/or modifying the electrical output.

Site Committee: A group of site staff, assembled by the District, to determine the needs of their individual campus.

Southern California Edison: Provides electric service to central, coastal and southern California. Website: http://www.sce.com/default.htm

State AB1881: The Water Conservation in Landscaping Act of 2006 (Laird). This act requires, among other actions, that the California Department of Water Resources (DWR) report to the Legislature on the status of water efficient landscape ordinances adopted by local agencies.

Storm Water Prevention Pollution Plan (SWPPP): Is a fundamental requirement of storm water permits. A SWPPP identifies all potential sources of pollution, which may reasonably be expected to affect the quality of storm water discharges from the construction site; describes practices to be used to reduce pollutants in storm water discharges from the construction site; and helps assure compliance with the terms and conditions of the permit (when the plan is designed for the individual site, and is fully implemented)

The California Environmental Quality Act: CEQA, or the California Environmental Quality Act, is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. Website: http://ceres.ca.gov/ceqa/

Title 24: The 24th title within the California Code of Regulations. Title 24 is reserved for state regulations that are building standards published by the California Building Standards Commission. Title 24 is given the name of California Building Standards Code by Health and Safety Code Section 18902. It is sometimes referred to as the State Building Standards Code.

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PART 9 – APPENDICES

Please refer to the Appendix Folder of Volume 1 for the below items.

APPENDIX A: NOT USED

APPENDIX B: Landscape Planting List

APPENDIX C: Board Resolutions

APPENDIX D: CHPS Scorecards

APPENDIX E: Standard Details - (DWG and PDF Files)

1. Striping – 220-yard track
2. Striping – Softball and Kickball
3. Striping – Four Square
4. Striping – Basketball Court
5. Striping – Circles
6. Striping – Grid
7. Striping – Handball
8. Striping – Hopscotch
9. Striping – Multiple Use Court
10. Striping – Tennis Court
11. Striping – Testing Lanes
12. Striping – Tether Ball
13. Striping – Volleyball – Paddle Tennis
14. Striping – Volleyball

15. Signage – Camera Notice
16. Signage – No Parking
17. Signage – Notice I
18. Signage – Notice II
19. Signage – Recycled Water
20. Signage – School Name
21. Signage – Tobacco & Vaping
22. Signage – Visitors
23. Signage – Room Identification
24. Computer Shelf Assembly Side
25. Computer Shelf Assembly
26. Maintenance Trailer Power
27. POS Network
28. Power Drop Detail
29. Data Drop Detail
30. 12 Mow Curb at Fence
31. 28 Mow Curb at Fence
32. Automatic W-Ball Valve
33. Concrete Cut and Patch
34. Concrete Mow Strip
35. Concrete Pad over CAB
36. Controller in Enclosure
37. Education Garden Box
38. Flow Meter
39. Gate Valve
40. Master Valve

41. PCC Walkway Edge
42. Pop-up Rotor
43. Pop-up Sprinkler
44. Redwood Header Details
45. Root Control Barrier Detail
46. Tree Well Root Control Barrier Detail
47. Tree Well
48. Yard Box Detail
49. Ground Cover Planting Detail
50. Shrub Planting Detail
51. Tree Planting in Turf Area Detail
52. Tree Planting w/ Barrier Detail
53. Tree Planting w/ Bubbler Detail
54. LBUSD Logo

APPENDIX F: WPA Report

APPENDIX G: Request for Variance Form

End of Part