

CONSTRUCTION MANUAL PART 1



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Introduction to Guideline Specifications

The LPS Guideline Specifications (LPSCM - Part 1) provide general direction to Architects and other Consultants for the design and specification of District facilities and facility improvements. They also identify for prospective vendors and contractors products and equipment pre-approved for conformance to District standards and expectations. They are intended to promote consistent quality and reasonable continuity in products, materials, systems and workmanship for all District facilities; they are not intended to limit creative design or functional problem-solving. **The Guidelines are not sufficiently complete to serve as buildable technical specifications**; any proposed deviation from them will require consultation with and acceptance by the LPS Operations, Maintenance and Construction Department (OMC). Consultants also will be responsible for informing the District of any conflict found between the Guidelines and current codes, standards or best practices.

Introduction to Model Specifications & Technology Standards

The LPS Model Specifications (LPSCM - Parts 2 and 3) provide more detailed definition of District construction standards and procedures for consultants and contractors, based upon cumulative District experience with facility design, maintenance and operations. **Each section is intended to serve as a model for buildable technical specifications, typically requiring customization** to address conditions, needs and applications for specific projects at particular facilities through detailed collaboration between consultants and LPS managers, technicians and users. Identification of technical requirements or prohibitions, pre-approved manufacturers, and preferred products or models is intended to optimize long-term value to the District and its facilities, balancing innovation and competitive first-cost with manageable standardization and sustainable life-cycle costing.

The LPS Technology Standards (LPSCM – Part 4) provide definitive goals, design and installation mandates and detailed specifications for District facilities infrastructure and systems supporting Information Technology, Domestic and Emergency Communications, Smoke/Fire Detection and Alarm, and Building Access and Security. The Standards identify professional certifications for design engineers, manufacturer certifications for installers, and relevant experience required for both. Proprietary platforms are identified for each major system, along with pre-approved providers of mutually compatible component devices. **Deviation from any provision in these Standards is prohibited except for unique circumstances and only following exhaustive review and sign-off by the LPS Operations, Maintenance and Construction Department (OMC), Information and Technology Services (ITS) and/or Security and Emergency Planning, as appropriate, via specific project programming and design. Construction drawings and Specifications based on these Standards must provide for complete, properly operating systems fully integrated into existing District central operations, monitoring and control.**

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DIVISION 02 – EXISTING CONDITIONS

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02 41 19 – SELECTIVE TECHNOLOGY SERVICES DEMOLITION

See applicable sections of Divisions 27 and 28. Technology Infrastructure systems will be defined for the purposes of this document as any voice, data, video, intercom, clock/bell program or public address system, and smoke/fire detection and alarm systems. The term system is defined as all of the components required for a fully functional technology operation meeting the stated purpose(s).

A – REMODELING AND NEW CONSTRUCTION PROJECTS.

A preconstruction meeting will be required with **LPS ITS Department** personnel a minimum of 30 days before project commencement. The purposes of this meeting will be to review the project scope of work, identify potential effects on existing technology systems, and to appoint an **LPS ITS** point of contact for the project. The **LPS ITS** contact will work with designers, project managers and building personnel to identify locations for technology components and interfaces.

The designated **LPS ITS** contact must be notified a minimum of ten working days prior to any demolition involving existing LPS facilities. **LPS ITS** personnel will help identify potential disruptions to existing technology systems. Any technology system that needs to be disconnected due to new construction will be done under supervision of the **LPS ITS** contact. Upon completion of any construction project requiring the disconnection of a technology system, reconnection of that system will also be done under supervision of the **LPS ITS** contact.

The Contractor will be solely responsible for replacing any technology system component(s) damaged as a result of that contractor's construction activities.

02 80 00 – HAZARDOUS MATERIALS REMEDIATION – Identification and removal of all hazardous materials on District property shall be the responsibility of the LPS Operations, Maintenance and Construction Department (OMC). Architect/Engineers and Contractors shall be responsible for reviewing District records (AHERA Management plans, etc.) before beginning work in an LPS facility and shall collaborate with the OMC Department to determine additional sampling and analysis needed to identify potentially hazardous materials that may be encountered as a result of planned demolition, remodeling and new construction. Remediation will be engineered and completed ahead of such work to the greatest extent possible; where suspected hazardous materials are encountered unexpectedly, work will be stopped immediately, and sampling and remediation will be expedited and certified by the District before work resumes.

★ END OF DIVISION 02 ★

DIVISION 03 – CONCRETE

03 05 00 – CONCRETING PROCEDURES – American Concrete Institute **ACI 318** Recommended Practice for Reinforced Concrete and Building Code Requirements.

03 11 00 – CONCRETE FORMING – American Concrete Institute **ACI 347** Recommended Practice for Concrete Formwork.

Remove all inadequate sub-grade material and replace with road-base. New or reused boards, plywood, metal, or combinations thereof, as required. New or reused boards, plywood, metal, or combinations thereof, as required. Board material may be used only to form concealed concrete surfaces, unless special design effects are approved by the LPS Operations, Maintenance and Construction Department (OMC). Framing, ties, coating(s): reuse as required. Landscape edging not permitted. Remove all organic materials used in forming when concrete work is complete. Remove all excavated materials from site when project is complete.

03 15 00 – CONCRETE ACCESSORIES:

- A – EXPANSION AND CONTRACTION JOINTS** – Control and construction joints to be located and formed in accordance with American Concrete Institute **ACI 318** Recommended Practice for Reinforced Concrete. Column isolation joint, slip joint, keyway, control joint, chamferstrip, dovetail anchor slot, and waterstop material(s) and location(s) as required.
 - 01 – EXTERIOR EXPANSION/CONTRACTION JOINT FILLERS** – Full depth of slab, per **ASTM D1751** Spec for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (nonextruding and resilient bituminous types) at maximum 24'0" centers in walks, ramps, curbs, gutters, pads, aprons, truckwells and platforms.
 - 02 – INTERIOR EXPANSION/CONTRACTION JOINT FILLERS** – Full depth of slab, nonextruding resilient nonbituminous material meeting **ASTM D1752** Spec for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction, between slabs-on-grade and concrete or masonry walls.
 - 03 – SCORING** – Tooled joints at maximum 4'0" centers each way and along edges in exterior sidewalks.

03 20 00 – CONCRETE REINFORCING – Comply with provisions of Concrete Reinforcing Steel Institute (**CRSI**) **MANUAL OF STANDARD PRACTICE**; bars, fabric(s), tendons and specialties as determined and engineered by the **A/E**. One set of final approved shop drawings to **LPS Operations, Maintenance and Construction (OMC) Department** files.

03 30 00 – CAST-IN-PLACE CONCRETE – American Concrete Institute **ACI 301** Specs for Structural Concrete in Buildings as interpreted by the **A/E** shall be followed as a guide for answering questions and settling disputes that may arise concerning concrete requirements.

- A – MATERIALS, PACKAGING, PRODUCTS** – Determined and engineered by the **A/E**; delivered, stored, handled and installed in manner to prevent weathering, damage, breakage, deterioration, intrusion, vandalism.
- 01 – ACCELERATOR** – Calcium chloride or any other chloride-containing or salt-like admixture shall not be used in concrete.
- 02 – HARDENER-SEALER** shall be provided on all interior and exterior flatwork slabs-on-grade, compatible with finish materials or coatings.
- B – MIXES** – Supplier shall submit current mix design(s) with compressive test results in accordance with **ACI 211.1**, showing slump(s) and air entrainment (6% +/- 1%) and minimum 28-day compressive strength(s) at 4,000psi or higher as specified.
- C – TOLERANCES:**
- 01 – FLATWORK** – Tops of footings and pads shall not be out of level more than 1/4" in 10', and slabs, floors, ramps, platforms, aprons and walks shall not be out of level more than 1/8" in 10', from elevation(s) specified.
- 02 – WALLS AND PIERS** shall not be out of plumb more than 1/8" in 10' nor vary more than 1/4" from true straight line(s).
- 03 – TOPS OF WALLS** shall not be out of level more than 1/4" in 10' length.
- D – FIELD QUALITY CONTROL** – The **A/E** or **LPS** will determine and have test cylinders taken and broken, at Owner expense, by an approved testing laboratory in accordance with **ASTM C31** Standard Method of Making and Curing Concrete Test Specimens.
- E – FINISHING:**
- 01 – INTERIOR FLATWORK** – Floor slabs shall be hard steel-troweled smooth, except heavy broom finish at hard tile beds; no dryers to accelerate set; floor slabs free of ripples, ridges and irregularities.
- 02 – EXTERIOR FLATWORK** – Walks, ramps, platforms, aprons, pads and decks shall have wood float medium broom finish, except as otherwise determined and specified by the **A/E**.
- 03 – ARCHITECTURAL FINISHING** – Exposed-to-view interior and exterior surfaces of concrete walls, columns, pilasters and beams shall have projections removed, offsets leveled, voids or damaged areas saturated with water and patched to a true and even surface with a wood float; then given a grout cleaned finish except as otherwise determined and specified by the **A/E** for design and aesthetic reasons.

03 38 00 – POST-TENSIONED CONCRETE – Location(s), design and engineering by the **A/E**; material(s) and finish(es) as determined by the **A/E**.

- A – TENDON LOCATION MARKERS** – Noncombustible (noncom) wood, plywood or hardboard not over 1/4" (6.5mm) thick by 2" wide by 12" long, arrow shaped; secured on top of bottom form material, centered on and beneath each tendon.
- B – ANCHORAGE COMPONENTS** shall meet minimum requirements set forth in "Tentative Specifications for Post-Tensioning Materials" prepared by Prestressed Concrete Institute.

03 40 00 – PRECAST CONCRETE – Forms per Spec Section 03 11 00; reinforcement per Spec Section 03 20 00; accessories per Spec Section 03 15 00; cement, fine and coarse aggregates, plasticizer, air-entrainment, accelerator and water per Spec Section 03 05 00. Where approved by **LPS**, provide structural and/or architectural precast and prestressed concrete columns, deck and framing panels, sections and other elements. Work includes: design, engineering, furnishing and erecting of precast/prestressed members such as beams, columns, joists, panels; provision of inserts and anchorage items embedded in members; provision of loose connection clips, plates, rods, and bolts required to attach members and elements to one another and to other structures; furnishing of shop drawings, product data and finish samples.

03 48 00 – MISCELLANEOUS PRECAST CONCRETE SPECIALTIES:

- A – **SPLASHBLOCKS** – 36" long by 16" (tapered to 12") wide by minimum 4" high, stock manufactured precast units for installation at each hose-bibb (wall hydrant) and rain leader (downspout) discharge; cast-in-place, built-in pans preferred where discharge is onto sidewalk or pavement.

03 60 00 – GROUTING – Where required, will include provision of catalyzed metallic, nonmetallic, or epoxy nonshrink grout packing at machinery or structural steel columns resting on masonry or concrete footings, piers, slabs, pads or walls.

- A – **RESTRICTIONS** – Epoxy grout may be used for patching and machinery bases only; not allowed under column base plates. Metallic grout may be used in concealed situations only. Noncorrosive metallic or nonmetallic grout is acceptable for exposed and concealed conditions as installer option, provided there are no extra cost(s) or charge(s) to Owner.

03 61 13 – DRYPACK GROUTING – Where required, will include provision of a nonmetallic, damp bedding mortar for seating structural and nonstructural framing on masonry or concrete walls and partitions. Dry-pack is not an acceptable substitute for grout packing of column or machinery base plates.

★ END OF DIVISION 03 ★

DIVISION 04 – MASONRY**04 05 13 – MASONRY MORTAR:****A – MATERIALS:**

- 01 – CEMENT** – ASTM C150 Specification for Portland Cement, Type I, Portland; Type II if within or adjacent to earth.
- 02 – LIME** – ASTM C207 Specification for Hydrated Lime for Masonry Purposes, Type S.
- 03 – FINE AGGREGATE** – ASTM C144 Specification for Aggregate for Masonry mortar, natural sand.
- 04 – WATER** – Fresh, clean, clear; potable, humanly consumable.
- 05 – CALCIUM CHLORIDE** or any other salt, salt-like, or chloride-like admixture/accelerator shall not be used in mortar.

- B – MIX** – ASTM C270 Specification for Mortar for Unit Masonry, Type S for bearing, nonbearing, and veneer walls; other type(s) per ASTM recommendations.

04 05 16 – MASONRY GROUTING – Cement, Fine Aggregate, Water, Calcium Chloride same as for 04 05 13 – MORTAR, preceding.

- A – COARSE AGGREGATE** – Same requirements as fine aggregate except washed gravel or crushed stone 1/8" to maximum 5/8".
- B – MIX** for bond beams, reinforced masonry walls, pilasters: determined to fulfill Structural requirements.

04 05 23 – MASONRY ACCESSORIES:

- A – ITEMS INSTALLED BUT NOT FURNISHED**– Masonry contractor shall install loose steel lintels, bearing plates, anchors, and other miscellaneous items furnished by others at no additional cost to **LPS**.
- B – HORIZONTAL JOINT REINFORCEMENT** – Truss or ladder type as required to fulfill Design, Code, and/or Engineering requirements.
- C – VERTICAL REINFORCEMENT** – Bars, ties, and tie wire as required to fulfill Design, Code, and/or Engineering requirements.
- D – EXPANSION JOINT FILLERS** – Material, shape and type to fulfill wall thickness conditions; location(s) where required.
- E – DOVETAIL ANCHORS** – 1" wide by nominal 4" long 14-gauge galvanized corrugated sheet steel spaced maximum 1'4" o.c. in dovetail slots provided by concrete contractor.

04 20 00 – UNIT MASONRY:

- A – FACE BRICK** – Grade–SW Type–FBX modular-sized, match existing in Addition situations, conforming to ASTM C216 Spec for Facing Brick (Solid Masonry Units Made from Clay or Shale); texture and color approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.
- B – GLASS BLOCK** – To meet Code and location requirements.
- C – PLAIN BLOCK** – Finish and weight required to meet Grade N Type 1 NI and NII of ASTM C90 Spec for Bearing Concrete Masonry Units and ASTM C145 Spec for Solid-Load Bearing Concrete Masonry Units.
 - 01 – SIZE(S)** – Modular height, width, length to fulfill designed wall and partition requirements and conditions.
 - 02 – SOLID UNITS** or concrete core-filled units as required shall be installed horizontally and vertically immediately under all points of structural bearing.
- D – BLOCK BRICK** – Like material, finish, strength as PLAIN BLOCK, solid, modular-sized 2-1/4" x 3-5/8" x 7-5/8" in compliance with ASTM C55 Spec for Concrete Building Brick.
- E – TEXTURED CONCRETE BLOCKS** – As required to meet manufacturer requirements and as acceptable to the **OMC Department**.
- F – PATTERNED CONCRETE BLOCKS** – As required by Design to meet manufacturer requirements and as acceptable to Owner.
- G – BOND** – Determined and Engineered by the **A/E**, approved by the **OMC Department**.
- H – COURSING** – Determined and Engineered by the **A/E**, approved by the **OMC Department**.
- I – JOINTS** – Determined and Engineered by the **A/E**, approved by the **OMC Department**.
- J – CLEANING** – Detergent-clean exposed walls and partitions; fiber brush from top down.

04 43 13 – STONE MASONRY VENEER – As required by Design and approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

04 43 40 – MARBLE – As required by Design and approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

04 43 50 – GRANITE – As required by Design and approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

04 73 00 – SIMULATED STONE MASONRY – As required by Design and approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

★ END OF DIVISION 04 ★

DIVISION 05 – METALS

05 12 00 – STRUCTURAL STEEL FRAMING – Temporary and permanent, shall conform to the AISC Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings; members, shapes, sizes, framing, connections, finish(es) and shop drawings, as required.

- A – WELDING** – Shall be in accord with Structural Welding Code-Steel of American Welding Society, and shall be made only by welders, tackers, or welding operators who have been qualified and certified within past six months by tests prescribed in **AWS D1.1**. Copies of required certification shall be a required submittal prior to starting such work. Exposed-to-view welds shall be ground smooth.

05 21 19 – OPEN WEB STEEL JOIST FRAMING– Fabrication and erection in accord with documents published by Steel Joist Institute and American Institute of Steel Construction; design, series selection, accessories, engineering, and shop drawing(s) as required.

- A – WELDING** – Same as Item 05 12 00-A preceding.

05 30 00 – METAL DECKING – Conform to Specifications for Design of Light Gauge Cold-Formed Steel by American Iron and Steel Institute, requirements of Steel Deck Institute Code for Recommended Standard Practice, **ASTM A611** Specification for Steel, Cold-Rolled Sheet, Carbon, Structural, and **Fed Spec QQ-S-775C**; ribbed/corrugated Grade C structural quality noncellular steel sheets; minimum 33,000 psi design strength; galvanized **ASTM A446** for roofs, **ASTM A570** shop primed for floors.

- A – FASTENING SYSTEM** – Pneumatic or percussion preferred; welding as may be required and as acceptable to the **LPS Operations, Maintenance and Construction (OMC) Department**.
- B – SHOP DRAWINGS** submittal shall include structural properties of decking; type, size and location of openings; type, size and extent of fastenings.

05 40 00 – COLD FORMED METAL FRAMING – AMICO, Bostwick, Inryco MILCOR, Keene, SPEED STEEL, USG, United States SUPER C, Wheeling STEEL FRAMING, Verco VERCOR; size(s), gauge(s), type(s), accessories, assembly, location(s) and finish(es) as required.

05 50 00 – METAL FABRICATIONS – Steel as per Section 05 12 00 preceding.

- A – FASTENERS AND ANCHORS** – Screws, bolts, clip angles, plates, brackets, connectors and washers: same material and finish to match fabricated item.
- B – LINTELS** – Steel angles, channels, tees, beams and plates as required to bridge masonry openings, minimum 6" bearing each end.
- C – FRAMED ROOF OPENINGS** – Steel angle support frames between steel joists for openings in metal roof decks that are over 6" round or square and not over 4' square or diameter; as required.
- D – HAND AND GUARDRAILS** – Nominal 1¼" i.d. Standard Schedule 40 steel pipe with wall brackets, wall returns, flange accessories and screw, bolt, rawl plug, molly, toggle,

tampin or expansion anchorage(s) suitable for back-up material encountered or specified.

- E – GUARD POSTS** – Nominal 6" i.d. Standard Schedule 40 steel pipe filled with minimum 3,000 psi concrete and buried at least half the total length of post.
- F – SIDEWALK GUTTERBOXES** – Not desired by **LPS**; where required, covers shall be solid with non-skid surface, galvanized steel or aluminum.
- G – TRENCH GRATING** – Iron; selected as required.
- H – ACCESS LADDERS** – Galvanized pipe, tube, bars, anchorages as required, with non-skid surface on rungs.
- I – STEEL PAN STAIRS** – Stringers, carriages, supports, framing of structural steel members; meeting Building Code live-load requirements, design as required.
- J – SHIP'S LADDERS** – Stringers, carriages, supports, framing of structural steel members to meet Building Code live-load requirements; non-skid treads.
- K – ALUMINUM TRIM** – Extruded anodized joint covers, fillers, corners, running trim in size(s), shape(s), finish(es), color(s) approved by the **OMC Department**.

05 70 00 – ORNAMENTAL METAL – Material(s), size(s), location(s), finish(es) approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

- A – SUBMITTALS** – Furnish product data edited for pertinence to project, shop drawings, samples and calculations, certifying compliance with loading requirements.

★ END OF DIVISION 05 ★

DIVISION 06 – WOOD AND PLASTICS**06 05 73.13 – FIRE RETARDANT TREATED WOOD/PLYWOOD:**

- A – INTERIOR** – Hoover Universal INTERIOR FIRE-X, Koppers DRICON, or Osmose FLAME PROOF LHC where relative humidity does not exceed 70 percent; Loughman NCX for hardwood(s).
- B – EXTERIOR** – Hoover Universal EXTERIOR FIRE-X or Koppers NCX where relative humidity may exceed 75 percent.

06 05 73.33 – PRESERVATIVE TREATED WOOD/PLYWOOD – Hoover Universal DIXIE CCA, Koppers DIXIE CCA or Koppers WOLMANIZED (CCA) Chromated Copper Arsenate preservative treated lumber and plywood.

06 10 00 – ROUGH CARPENTRY – Temporary and permanent materials and methods of wood framing, sheathing, and decking for floors, walls, partitions, roof; setting of miscellaneous anchorages, back-up, and framing devices furnished by other trades.

- A – LUMBER** – WWPA Standard Grading Rules for Western Lumber, noncombustible or other pre-treatment as required by code.
 - 01 – BOARD LUMBER** (1" thick by 2" or more wide) – Nominal dimension S4S S-Dry No. 3 Common or Standard and Better for grounds, sleepers, furring, stripping, bucks, X-bridging, shims and rungs.
 - 02 – LIGHT FRAMING AND STUDS** (2" to 4" thick, 2" to 6" wide, 10' and shorter) – Nominal dimension S4S S-Dry No. 2 and Better minimum 1000Fb single for studs, posts, joists, rafters, plates, framing, strips, blocking, lintels, ledgers, solid bridging, bracing, roof curbs, stringers and carriages.
 - 03 – STRUCTURAL JOISTS AND PLANKS AND APPEARANCE** (2" to 4" thick, 5" and wider) – Nominal dimension S4S S-Dry Standard and Better or Stud Grade minimum 650Fb for grounds, sleepers, furring, stripping, bucks, nailers, cants and shims.
- B – SPECIAL CONSTRUCTION AIDS** – Temporary ladders, runways, platforms, catwalks of Structural, Light Framing, Board Lumber as precedingly specified for general use by all trades.
- C – ROUGH HARDWARE** – Nails, spikes, screws, bolts, ramsets, anchors, similar items not furnished by other trades but required to draw-up and rigidly secure members: wood-to-wood, wood-to-metal, wood-to-masonry, wood-to-concrete, metal-to-metal, metal-to-masonry, metal-to-concrete, and other materials to satisfactorily complete the various phases of construction toward erection of a sound, safe, nonsqueak structure.
- D – PLYWOOD** – Each panel identified with grade trademark of APA and meets requirements of PS 1, noncom where noted or required by code; type, group, grade, finish, for purpose intended.
- E – WALL SHEATHING** – Gypsum or fiberboard as determined and engineered by the **A/E** for purpose intended in compliance with code requirements.

- F – BLOCKING/BACKING** – In-the-wall/partition miscellaneous lumber/plywood back-up blocking/backing required for installation/mounting of fixtures, frames, hardware, railings, cabinets, casework, countertops, shelving, specialties, miscellaneous items of the work.

06 17 33 – PLYWOOD-WEB JOISTS – Trus-Joist solid or laminated Douglas Fir or Hemlock chords having 15 percent maximum moisture content, fingered, and glued scarf joints acceptable; Structural I C-C EXT-APA plywood webs.

06 17 36 –METAL-WEB WOOD JOISTS – Shop-fabricated Trus-Joist or Sanford SPAN-JOIST roof and floor joists of wood top and bottom chords and tubular steel trussing steel pin jointed framing system complete with associated bridging, bracing, anchorages, fasteners, supports.

06 17 53 – SHOP-FABRICATED WOOD TRUSSES – WWPA Douglas Fir-larch, Hem-Fir, Southern Yellow Pine or Spruce, minimum $F_b=1650$ psi for repetitive usage maximum 15 percent moisture content kiln dried lumber with no knots over 1" diameter, no splits, no warps, no twists; minimum $E=1,500,000$; maximum deflection $L/480$; die-stamped integral toothed galvanized steel connectors each side each joint; galvanized fasteners; galvanized bearing plate anchors and framing connectors.

06 18 00 – GLUED LAMINATED STRUCTURAL UNITS – AITC Architectural Grade coast region Douglas Fir or Southern Pine roughsawn (S4S) surfaced prefabricated glue-laminated wood arch, bent, column, beam, joist, purlin, truss, lintel units with associated hardware anchorages; manufactured, quality marked, certified for Wet condition of service in conformance with Voluntary Products Standards PS 56.

- A – HARDWARE** for joining members to each other and to supports shall be structural steel fabrications prime-shop-coat-painted for interior and zinc-coated for exterior locations.

06 18 20 – GLUED-LAMINATED VENEER LUMBER STRUCTURAL UNITS – Trus-Joist MICRO-LAM parallel laminated 1/10" or 1/8" Douglas Fir continuous veneer strips waterproof glued-up prefabricated glued-laminated lumber beam, joist, purlin, rafter, lintel, stud, column units with associated hardware anchorages.

06 20 00 – FINISH CARPENTRY – includes provision of door and window hardware and hollow metalwork, thresholds, weatherstripping, doors, windows, frames, access panels, specialties, signs, millwork, siding, shelving, poles, hooks, paneling, trim, cabinetwork, counters, accessories, and other finish items not installed by other trades.

06 24 00 – PLASTIC LAMINATE(S) – NEMA LD 3-1.01 General Purpose, Postforming, Cabinetliner, Backer, Specific Purpose, High Wear, Fire-Rated types based on service requirements; minimum .050" thick facing sheets, minimum .020" backing sheets; NEMA LD 3-4.03 2.0 and AWI 100-G-11 resorcinol and phenol-resorcinol, casein, epoxy, polyvinyl, contact adhesive appropriate for service intended.

06 40 00 – ARCHITECTURAL WOODWORK – Determined and specified by the **A/E** with **Operations, Maintenance and Construction (OMC) Department** approval and acceptance.

06 41 16 – PLASTIC LAMINATE-CLAD ARCHITECTURAL CABINETS – As determined and specified by the **A/E** with **Operations, Maintenance and Construction (OMC) Department** approval.

06 41 80 – WOOD COUNTERTOPS – Not for use with cut-in sinks or lavatories (see Spec Section 12 36 00 – Specialty Countertops).

- A – PARTICLEBOARD** – Bohemia, Boise Cascade, Georgia-Pacific, Weyerhaeuser, or Willamette Industries flat panel, ANSI A208.1 Type 1, medium density Grade B, minimum 45#/cf (720kg/m³) class 2, minimum ¾" (2cm) thick unless otherwise noted.
- B – CLEATS/BLOCKING/FRAMING/BRACING** – Nominal 2x Light Framing and Studs or Structural joists and Planks and Appearance lumber per Items 2.01-A-02 and 2.01-A-03 of Spec SECTION 06100.
- C – FABRICATION/MANUFACTURE/ASSEMBLY/CONSTRUCTION** – Shall be in accord with AWI Custom Grade requirements.
- D – COUNTERTOPS** – Shall have a formed or milled front edge molding; rolled edges are not required, and self-edging is not acceptable.

06 60 00 – PLASTIC FABRICATIONS:

- A – VALANCE LOUVERS** – Scientific Lighting Products PARAVENT Functional Specular chrome finish or the **A/E** accepted equivalent customized panels to fit job site conditions.
- 01 – RETAINER SUPPORT CLIPS** – Shop-coated sheet steel or aluminum inverted tees, well angles, or other shapes noted/detailed.

★ END OF DIVISION 06 ★

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 01 50 – PREPARATION FOR REROOFING – See LPS Model Specifications. This Section includes selective demolition and renovation for re-roofing work. Related Sections include: 07 54 10 – Adhered Thermoplastic Membrane Roofing; 07 22 00 – Roof and Deck Insulation Boards and Roof Accessories.

07 11 13 – BITUMINOUS DAMPPROOFING – For below-grade exterior foundation walls above finish floor levels.

- A – ASPHALT OR BITUMINOUS COMPOUND** – Sonneborn HYDROCID 600, CELOTEX TAR BASE Dampproof Coating, Karnak BLACK ASPHALTUM COATING or J & P Petroleum Products TEX-MASTIC No. 720 Foundation Coating; from top of footing or bottom of grade beam to indicated adjacent finish grade; apply two separate coatings, primer, and one finish coat to produce a visibly unbroken film.

07 12 00 – BUILT-UP BITUMINOUS WATERPROOFING– Protection on miscellaneous below-grade items and materials.

- A – COVERAGE** – After bolting or welding and prior to backfilling operations by others, provide a minimum 30-mil (.030") [1mm] trowel-grade J & P Petroleum Products TEX-MASTIC No. 712 or Metropolitan Roofing Supplies DUREX DAMPPROOFING MASTIC asphaltic mastic dampproofing bitumen coating on all exposed-to-earth portions of steel, wood and/or concrete columns and on miscellaneous steel anchorage items: angles, plates and bolts associated with on-site, below-grade masonry or poured-in-place concrete foundations.

07 13 13 – BITUMINOUS SHEET WATERPROOFING – At wall(s), deck(s), floor(s), floor area(s) and planter(s) to fulfill waterproof building requirements.

07 14 00 – FLUID-APPLIED PENETRATING SEALER – Required by LPS for horizontal deck and vertical concrete and masonry wall surfaces, as determined and engineered by A/E to fulfill building design requirements.

07 18 00 – TRAFFIC COATINGS – Fluid-applied, waterproof, elastomeric membrane for weather exposure wearing surface(s) subject to foot or automotive traffic, if contemplated or required to match existing, must be approved by the **Operations, Maintenance and Construction (OMC) Department**.

- A – ACCEPTABLE MANUFACTURERS** and proprietary systems acceptable to LPS include Gaco Western GACODECK; Gibson Homans ETERNAFLEX; TOCH Carboline POLYTOK Deck Coating 131.

07 21 13 – BOARD INSULATION – Underfloor topping on horizontal deck, applied to the underside of deck, walls or as otherwise required to fulfill building design requirements.

- A – INSULATION ABOVE HORIZONTAL ROOF DECK** – Extruded cellular polystyrene type; thermal conductivity of 0.20 Btu/sq.ft./hr./°F/inch at 75°F; minimum compressive strength of

40 psi; maximum water vapor transmission 0.6 perm per inch; maximum 1 percent water absorption by volume; shiplapped edges similar to "Styrofoam SM" manufactured by Dow Chemical USA. (See also Sections 07 22 00 and 07 22 10.)

- B – INSULATION BELOW HORIZONTAL DECK** – Celotex THERMAX exposed insulation boards in Interlocking PVC Strips Without Furring or Owens-Corning COMMERCIAL USE BOARD system to produce minimum resistance value R-5.
- C – RIGID WALL INSULATION** – Boardstock, square edges, to produce a minimum Thermal "R" Resistance factor of 11.0; ZONALITE Styrene Foam; Dow THURANE; Owens-Corning URETHANE or accepted equivalent.
- D – PERIMETER INSULATION** – Subgrade vertical- and horizontal- placed plastic board insulation on interior (and exterior) of building foundation walls (grade beams) and under slabs-on-grade to fulfill Code and building design and engineering requirements.
- E – PROTECTION BOARD** – Semirigid composition board, 1/8" thick, asphaltic laminated, non-asbestos containing premolded type.
- F – ADHESIVE** – Type recommended by insulation manufacturer; capable of securely adhering insulation to applicable surface.

07 21 16 – BATT AND BLANKET INSULATION:

- A – THERMAL INSULATION** – United States Gypsum THERMAFIBER Regular, Open-Faced, Foil-Faced in plenums, Flame Resistant, Fast-Fit, M-S, Z-Furring type(s) as relevant to location(s), or comparable spun rock-wool, glass or mineral fiber blankets manufactured by Johns-Manville, Owens-Corning, or Premium Brand; minimum nominal thickness(es) to meet minimum resistance R Factors (R-30) required by local Code and Colorado Energy Code and to fulfill building design requirements.
- B – SOUND INSULATION** – United States Gypsum THERMAFIBER Sound Attenuation paperless, foil-less, semi-rigid mats, unfaced paperless rolls or batts; or comparable spun rock-wool, glass, or mineral fiber batts as manufactured by Johns-Manville, Owens-Corning, or Premium Brand meeting FS HH-I-521E Type I, as required to fulfill requirements of local code, building design and **LPS** requirements.
- C – FIRE SAFETY INSULATION** – United States Gypsum THERMAFIBER products meeting FS HH-I-558B, Form A, Classes 1 and 2, or comparable system(s) to fulfill design, engineering and applicable code requirements.
- D – TOP-OF-WALL INSULATION** – Sound blankets or comparable paperless, foil-less, semi-rigid glass, rock, or mineral fiber mats, in single or multiple layers compressed to snugly fill void at juncture between top of walls or partitions and upper floor or roof deck.

07 21 23 – LOOSE FILL INSULATION – CertainTeed INSUL-SAFE II or BLOWING WOOL, Manville BLOWING WOOL, or accepted equivalent pneumatic blown loose fill fibered glass nodules manufactured and fabricated free of formaldehyde and asbestos.

07 21 29 – SPRAYED INSULATION – Formaldehyde and asbestos-free spray-on thermal and sound insulation where determined; national Cellulose CELBAR, American Energy Products SprayDon Type SA, Thermo Products ThermoCon, or accepted equivalent.

07 22 00 – ROOF AND DECK INSULATION – See LPS Model Specifications. Related Sections include: 07 54 10 – Adhered Thermoplastic Membrane Roofing; 07 22 16 – Roof Board Insulation.

07 22 16 – ROOF BOARD INSULATION – See LPS Model Specifications. Related Sections include: 07 54 10 – Adhered Thermoplastic Membrane Roofing; 07 22 00 – Roof and Deck Insulation.

07 24 00 – EXTERIOR INSULATION AND FINISH SYSTEMS – Built-up simulated cement plaster (stucco) walls and soffits, complete with sheathing and rigid insulation backup boards, adhesive, reinforcing fabric, synthetic cement waterproofing textured hardcoat finish and sealant, where determined to fulfill building design requirements.

07 26 00 – LAMINATED VAPOR RETARDER – On top of crawlspace earth floor and under new interior concrete slabs-on-grade.

- A – **BARRIER** – St. Regis MOISTOP, W. R. Meadows PREMOLDED MEMBRANE or **A/E** accepted equivalent heavy kraft paper laminated together with glass fiber reinforcement overcoated with black polyethylene film on each side; resistant to decay when tested according to ASTM E154; fabricated free of formaldehyde and asbestos.
- B – **TAPE** – Monsanto GER-PAK black 2½" (6.5 cm) wide or accepted equivalent for securing barrier to foundation walls and for sealing barrier lap joints.

07 31 13 – ASPHALT SHINGLES roofing/siding system(s) are not generally desired by **LPS**; if contemplated or required to match existing conditions, must be approved by the **Operations, Maintenance and Construction (OMC) Department**.

07 31 29 – WOOD SHINGLES AND SHAKES roofing system(s) are not generally desired by **LPS**; if contemplated or required to match existing conditions, must be approved by the **Operations, Maintenance and Construction (OMC) Department**.

07 32 00 – ROOFING TILE SYSTEMS, including clay, slate, concrete, metal, plastic are not generally desired by **LPS**; if contemplated or required to match existing conditions, must be approved by the **Operations, Maintenance and Construction (OMC) Department**.

07 46 23 – WOOD, PLYWOOD, HARDBOARD SIDING – If required to match existing conditions, must be approved by the **Operations, Maintenance and Construction (OMC) Department**.

07 46 43 – PREFORMED CLADDING/SIDING – If required to match existing conditions, must be approved by the **Operations, Maintenance and Construction (OMC) Department**.

07 54 10 – ADHERED THERMOPLASTIC MEMBRANE ROOFING – See LPS Model Specifications. Related Sections include: 07 54 10 – Adhered Thermoplastic Membrane Roofing; 07 22 00 – Roof and Deck Insulation; 07 22 10 – Roof Insulation.

07 61 00 – STANDING-SEAM METAL ROOFING – See LPS Model Specifications. Related Sections include: 07 62 00 – Sheet Metal Trim and Flashing.

07 62 00 – SHEET METAL TRIM AND FLASHING – See also LPS Model Specifications Section 07 62 00. Minimum 24-gauge galvanealed, Kynar, or baked enamel finished wall and cap flashings, counterflashings, gravel stops, reglets, roof vents, gutters, conductor heads, scuppers, spitters, deflectors, divertors, rainleaders, downspouts, pitch pans, splash pans, associated anchor clips, straps, accessories, trim.

- A – FLASHINGS AND GRAVEL STOPS** shall have 1" wide open expansion joints at maximum 10'10" centers covered with minimum 4" (10 cm) wide interlock cover; no joints closer than 2'0" to corners. Overlap jointings not acceptable.
- B – MISCELLANEOUS** – Clips, anchors, straps, same material as item to be anchored. Clips shall be continuous, not strips, continuing through expansion joint covers, with clip expansion allowance(s) occurring midway between expansion joint covers.
- C – HEM** exposed edges of flashings and stops ½" on underside.

07 72 00 – ROOF HATCHES, SCUTTLES AND SMOKE VENTS as needed and shown must have insulated top and minimum 12" high curb; galvanealed or similar metal finish ready for paint. Include safety post-extension device at roof hatches with fixed ladder access.

07 72 13 – PREFABRICATED ROOF CURBS, if contemplated or required to match existing, must be approved by the **Operations, Maintenance and Construction (OMC) Department** prior to bid issue of construction/reconstruction documents.

07 80 00 – FIRE AND SMOKE SEALS:

- A – STANDARDS** – In the absence of other information, standards of the following organizations apply: Underwriters Laboratories Fire Resistance Directory, current edition.
- B – SUBMITTALS** – The following minimum submittals are required prior to start of any work:
 - 01** – Product Data, including MSDS for all products
 - 02** – Shop drawings or materials schedule is preferred and is mandatory for projects with total contract value exceeding \$1,000,000 (typical).
 - 03** – Manufacturer instructions and field reports.
- C – CLOSEOUT:** All submittals listed above, updated to Record Document status
- D – THERMAL AND MOISTURE PROTECTION:**
 - 01** – Specify Underwriters Laboratories fire-rated assembly designations in the contract documents.

- 02 – Firestops are required at every construction joint and penetration in fire-rated assemblies.
- 03 – Sprayed cementitious fireproofing as required per IBC.
 - a – Minimum bond strength per ASTM E736: 200 psf
 - b – Air erosion per ASTM 859: 0.00 grams loss
 - c – Surface Burning per ASTM E84: Smoke = 0, Flame = 0, Fuel = 0
 - d – Use W/D ratio to determine application thickness.
 - e – Remove paint, lubricant, compounds and other contaminants from substrate metal as recommended by fireproofing manufacturer to assure specified bond strength.
 - f – Mineral fiber fireproofing is prohibited.
- E – Owner reserves the right to perform separate commissioning inspection and/or retain the services of an independent testing agency to inspect, sample, and confirm compliance with work in this section.

07 90 00 – JOINT PROTECTION:

- A – **EXTERIOR SEALANTS:**
 - 01 – **BUILDING(S)** – ConTech SONNEBORN SONOLASTIC NP II, Pecora DYNATROL II two- or three-part non-sag sealant, or other acceptable to the **Operations, Maintenance and Construction (OMC) Department.**
 - 02 – **PAVEMENTS AND WALKS** – Pecora UREXPAN NR-200 self-leveling sealant or other acceptable to the **OMC Department.**
 - 03 – **WINDOWWALL/CURTAINWALL/STOREFRONT:**
 - a – **INTERNAL** – Dow or General Electric SILICONE SEALANT.
 - b – **PERIMETER** – Dow or General Electric SILICONE SEALANT.
- B – **INTERIOR CAULKING** – DAP, Gibson-Homans, Pecora, or Tremco latex, acrylic, or oil base caulk.
 - 01 – **FIRE RESISTANT SEAL** – Chase Technology Corporation CTC PR-855 CHASE-FOAM fire resistant silicone foam sealant for fire stops and wall/floor penetration seals.
- C – **JOINT FILLER (backer rod)** – Round, square, or rectangular as appropriate to joint requirement(s), compressible gray or white polyethylene, or polyurethane foamed plastic such as DENVER FOAM, Dow ETHAFOAM SB, untarred oakum or fiberglass; installer option at no extra cost(s) charge(s) to **LPS.**
- D – **BOND BREAKER** – Clear or opaque polyethylene tape or film; self-adhesive type where applicable.
- E – **JOINT CLEANER/PRIMER/SEALER** – Material as recommended by the caulking or sealant manufacturer.
- F – **COLOR(S)** selected/approved by the **OMC Department** from manufacturers' standard available colors.

07 95 13 – EXPANSION JOINT COVER ASSEMBLIES – Prefabricated metal expansion joint covers for interior and exterior exposed applications; material(s), size(s), configuration(s), location(s), finish(es) as determined and engineered by the **A/E**.

- A – SUBMITTALS** – Furnish product data edited for pertinence to Project, with shop drawings, samples and calculations certifying compliance with loading requirements.

★ END OF DIVISION 07 ★

DIVISION 08 – DOORS AND WINDOWS

08 11 00 – METAL DOORS AND FRAMES – Insulated hollow metal doors, pressed steel door/window frames, and stick system components for door openings, borrowed lights, casings, transoms and sidelights; with associated louvers, view panels, moldings, labels, anchors, reinforcements and accessory items. Manufacturers shall be SDI members.

- A – FRAMES** – Minimum 16-gauge with 5/8" integral stop; knock-down (KD) type acceptable for interiors; mortised, reinforced, drilled, and tapped for mortise hardware; anchors, connection members, clips reinforcement(s) required by code(s), manufacturer and the **Operations, Maintenance and Construction (OMC) Department** for anchorage and support.
 - 01 – ALL FRAMES** shall have minimum 7-gauge hinge reinforcements, 14-gauge lock strike reinforcing, and 12-gauge closer reinforcing. Reinforce for both surface-mounted and mortised hardware.
 - a – Fabricate** frames with mitered and faces only welded corners, re-prime at the welded areas. All welds to be flush with neatly mitered or butted material cuts. Conceal fastenings unless otherwise indicated.
 - b – All frames** over 48" in width shall be 14-gauge.
 - c – Drill** stops to receive three (3) silencers on strike jambs of single frames and two (2) silencers on heads of double frames, except on weather-stripped frames.
 - d – Center mullions** must be removable type, unless pre-approved by the **OMC Department**.
 - e – Provide** temporary shipping bars, to be removed before setting.
 - 02 – INTERIOR FRAMES** shall be Level 2, 16-gauge, CRS.
 - 03 – EXTERIOR FRAMES** shall be Level 3, 14-gauge, galvanized or galvanealed. Basis of design shall be Curries M Series, unequal rabbet. Approved manufacturers are Ceco and Steelcraft.
 - a – Reinforce** all exterior frames for concealed continuous hinges.
 - b – Grout** all exterior frames solid. At frames with electronic devices and conduit, provide minimum 0.0179" thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.
- B – DOORS** – Full flush panel type, 1 3/4" thick, of materials and ANSI/SDI-100 grades and models specified below, or as indicated on drawings or schedules, with or without edge seams, no face seams, constructed of two panels minimum, 18-gauge prime commercial cold-rolled stretcher level steel free of pitting.
 - 01 – ALL DOORS** shall have beveled edges 1/8" in 2" and shall have inverted top and bottom channel reinforcement not less than 16-gauge, welded to the face sheets. Where necessary to preclude the use of through-bolts, doors shall be reinforced for hardware as follows: exit devices 14-gauge, door closers 12-gauge.
 - 02 – INTERIOR** – Interior doors shall be Level 2, Model 2 - Seamless. Basis of Design: Curries 707; Approved Manufacturers: Ceco, Steelcraft.
 - a – Interior doors** shall be minimum 18-gauge cold-rolled steel with both lock and hinge rail edge of door intermittently welded, filled and ground smooth the full height of door.
 - b – Cores** shall be honeycomb, polystyrene or polyurethane as indicated for sound deadening.

08 14 00 – WOOD DOORS

- A – INTERIOR WOOD DOORS** – Flush style, SWI Custom grade, SCL-5ply core or PC-5ply core with 4" (10 cm) stiles and 6" (15 cm) rails; premium Grade A face veneers minimum 1/8" thick; with matching solid top, bottom, and side edges bonded to the core; for transparent finish to match existing. Veneer cut, species and face assembly (book match or running match) shall be coordinated for each project/building with the **LPS Operations, Maintenance and Construction (OMC) Department**. Fire doors shall have AWI FD ratings of 1½, 1, ¾ hour, and 20 to 30 or 20 minute, per location, meeting UL requirements, ASTM E152 and used in accordance with NFPA 80.
- B – NON RATED AND 20-MINUTE DOORS** – Engineered core complying with WDMA I.S.1 A, bonded to door faces, stiles and rails using a Type I adhesive. Components are to be assembled to meet or exceed 20- minute fire- door specifications for ULIOC fire test requirements. Door shall meet or exceed WDMA I.S.1 A Extra Heavy Duty performance standards. Basis of Design: Marshfield Door; Approved Manufacturers: Graham, VT Industries.
- C – FIRE RATED DOORS OVER 20 MINUTES** – Supply fire-resistive composite mineral core construction to provide the fire rating indicated, bonded to door faces, stiles and rails using a Type I adhesive. Hinge stiles shall have manufacturer's standard laminated-edge construction with improved screw holding capability and split resistance; outer stile shall match face veneer. Cross-reference and coordinate with hardware to ensure that total opening engineering is compatible with ULIOC Standard for Positive Pressure Fire Tests of Door Assemblies and UBC 7-2 Fire Tests of Door Assemblies. Basis of Design: Marshfield Door; Approved Manufacturers: Graham, VT Industries.
- 01 – MINERAL CORE DOORS** shall include composite blocking approved for use In doors of fire ratings indicated, with improved screw holding capability and split resistance as necessary to eliminate the need for through-bolting hardware and as follows:
- a** – 5" top blocking
 - b** – 4 ½" x 10" lock blocks
 - c** – 5" mid-rail blocking at doors indicated to have exit devices
- 02 – INTUMESCENT SEALS**, Category A or B, shall be provided as required.
- 03 – STAIRWELL ENCLOSURES** and other locations as indicated shall have doors with a maximum transmitted temperature end-point of not more than 250°F above ambient after 30 minutes of standard fire-test exposure, as required by Code.
- 04 – PHYSICAL LABEL** shall be permanently affixed to the fire door at an authorized facility.
- 05 – CERTIFICATION** of compliance for units exceeding sizes of tested assemblies shall be provided by a qualified testing agency, demonstrating that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size. Certification(s) of compliance shall be made available upon request by the Authority Having Jurisdiction.
- D – MISCELLANEOUS**
- 01 – FINISH** all doors to receive a transparent finish at the factory using WDMA TR-6 catalyzed polyurethane for a Premium Grade, semi-filled finish, produced by applying an additional finish coat to partially fill the wood pores. Field finish doors indicated to receive an opaque finish in accordance with Division 09, Finishes. Stain and finish shall be coordinated for each project/building with the **OMC Department**.

- 02 – LOUVERS** shall be extruded aluminum alloy AA6063-T5 Duranodic dark bronze finish (or as required to match existing), with fixed 45-degree straight blades or vision-proof inverted V- or Y-blades constructed of galvanized 0.040" thick steel, power-coated or factory-primed for painted finish in baked-enamel. Metal louvers for fire-rated doors shall include fusible link and closing device listed and labeled for use in doors with fire-protection rating of 1-1/2 hours or less. Subject to compliance with rating requirements, louver construction and material shall be the same as non-rated versions.
- 03 – VISION PANELS** shall have manufacturer's standard metal light frame formed of 0.048" thick cold-rolled steel sheet with baked-enamel or powder-coated finish approved for use in doors of fire rating indicated, using single-pane glass.

08 31 00 – ACCESS DOORS – Steel, as sized and located on drawings; fire rated where required by Code.

08 33 23 – OVERHEAD COILING DOORS – Interlocking, continuous length without splice, flat slat curtain, electric operated; fire-rated where required by code.

08 33 26 – OVERHEAD COILING GRILLES – Aluminum; electric operation.

08 36 13 – SECTIONAL PANEL DOORS – Steel, full flush flat galvanized exterior and interior panels; insulated exterior location(s); galvanized hardware; weather stripped exterior location(s); electric operated with emergency manual chain hoist.

08 41 13 – ALUMINUM ENTRANCES AND STOREFRONTS – Not desired by LPS at existing facilities. Where approved by the LPS Operations, Maintenance and Construction (OMC) Department, new aluminum entrances shall be equal to Kawneer 2250 or Tri-Fab 451T thermal break, with anodized or Kynar finish and wide-stile profile as follows: sides 5" + stops; top rails 6.5" + stops; middle rails 8.25" + stops; bottom rail 10" + stops. No drop plates; exit device to be centered in middle rail.

08 42 29 – AUTOMATIC ENTRANCES – Not desired by LPS, except as required by ADA guidelines and Security planning.

08 44 00 – CURTAIN WALL AND GLAZED ASSEMBLIES – Not desired by LPS at existing facilities. Refer to Section 08 41 13 Entrances and Storefronts.

08 45 00 – TRANSLUCENT WALL AND ROOF ASSEMBLIES – Prefabricated flat or curved translucent glass fiber sandwich panel systems for wall or skylights, as manufactured by Kalwall or LPS-approved equal.

- A – PANEL FACES** – Glass fiber reinforced thermoset resin specifically designed for architectural use. Faces shall not deform, deflect, drip or detach when subjected to heat or flame and shall not discolor after extended exposure to sunlight.

- B – INSTALLATION** – Do not install within ten (10) feet of adjacent grade or finish floor unless approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

08 50 00 – WINDOWS

- A – EXTERIOR WINDOWS** – Fiberglass Reinforced Plastic (FRP) windows equivalent to 525 Series by Serious Materials, Inc., Sunnyvale, CA, are preferred (see LPS Model Spec Section 08 54 13); but thermal-break aluminum, hollow metal framed or vinyl-clad wood may be used if approved in advance by the **LPS Operations, Maintenance and Construction (OMC) Department**. Dark Bronze-finished units may be of the following types:
- 01 – PICTURE** windows shall be fixed
 - 02 – AWNING** windows shall be top-hinged, project out
 - 03 – SLIDING** windows shall be horizontal sliding
- B – INTERIOR WINDOWS** – Borrow-lights and vision panels should be steel hollow metal construction but also may be aluminum; moveable units shall be aluminum.
- C – OPERABLE WINDOW VENTS** – Provide in each occupied room, even if building is air conditioned, to allow use of building in event of power outage or energy shortage. Vents shall be bottom-hinged, in-swing, weather-stripped, shall not project beyond wall line, and shall have positive interior latch.
- D – SCREENS** – Charcoal-colored metal or fiberglass screen cloth in roll-formed or extruded aluminum frames, factory-finished in, vandal resistant, on vent portions of fenestration.
- E – GLAZING** – Bronze-tinted high-performance triple-pane insulating glazing units with one low-e coated suspended film and inert gas-filled chambers; Performance Class Structural to be Commercial CW-PG45 (fixed), CW-PG50 (awning or hopper), CW-PG30 (sliding). Inside glaze with snap-on beads.
- F – NATURAL LIGHT** – Provide exterior windows in principal stairways. Keep windows high to reduce glass breakage.
- G – ENERGY EFFICIENCY** – Follow requirements of ASHRAE 90 and Colorado Energy code for thermal design of exterior wall assemblies, which will affect number and size of windows used.
- 01 – WHOLE-UNIT** U-Value performance shall be U-0.20 maximum (fixed units) or U-0.22 (moveable), modeled in accordance with NFRC 100 standards. Ultraviolet blockage shall exceed 99% for all window elements.
 - 02 – CENTER-OF-GLASS** U-Value performance shall be U-0,14 maximum; Solar Heat Gain Coefficients shall be SHGC-0.30 maximum for south, east and west elevations. Visible light transmission shall be 40% minimum.
- H – VANDALISM REDUCTION** – Avoid using windows or window walls in areas that are screened from public view.
- I – GLASS CLEANING** – Provide hinged ventilators above ground level floor areas to allow cleaning of glazing from interior of building.
- J – GLASS HEIGHT** – Glazing below 3'0" above floor level is not acceptable, unless approval is obtained from **LPS** prior to Construction Documents Phase.

- K – **SOUND TRANSMISSION** – Windows shall be rated for not less than STC-30 when tested for laboratory sound transmission loss per ASTM E90 and ASTM E413.
- L – **WARRANTY** – Manufacturer's standard 10-year warranty on frames and insulated glazing units.

08 54 13 – FIBERGLASS WINDOWS – See LPS Model Specifications. Related Sections include: 08 54 13 – Fiberglass Windows; 07 92 00 – Sealants and Caulking.

08 60 00 – ROOF WINDOWS AND SKYLIGHTS – Individual units are not desired by LPS. Skylight systems must have approval of the **LPS Operations, Maintenance and Construction (OMC) Department** prior to Construction Documents Phase.

08 71 00 – DOOR HARDWARE – Provide door hardware as specified herein, in 626 (US26D) Brushed Chrome, 630 (US32D) Stainless Steel or 612 (US10) Satin Bronze finish, to match the predominant finish in each building or as directed by the **LPS** locksmith.

A – MATERIALS/ITEMS:

- 01 – **BUTT HINGES** – Full mortise 4½ x 4½ Heavy Duty Steel, with NRP (Non Removable Pin) at Reverse bevel locked Doors, Stanley or equivalent Bommer, as follows:
 - a – Stanley CB1961R (or Bommer LB8005) at doors over 36", as required
 - b – Stanley CB1960R (or Bommer LB8002) at doors up to 36"
 - c – Stanley CB1901R (or Bommer LB8004) at interior doors over 36"
 - d – Stanley CB1900R (or Bommer LB8000) at interior doors up to 36"
- 02 – **CONTINUOUS HINGE** – At selected or aluminum doors, Stanley or equivalent Select, as follows:
 - a – **Geared** - Stanley 661 (standard duty) or 661D (heavy duty), or Select SL11 (standard duty) or SL11HD (heavy duty)
 - b – **Pin and Barrel** - Stanley 651 (standard duty)
- 02 – **FLOOR PIVOTS** – Not desired at LPS.
- 03 – **NON-RATED SPRING HINGES** – Bommer, Chicago, Milwaukee.
- 04 – **FIRE-RATED SPRING HINGES** – McKinney, Stanley, Hager.
- 05 – **CYLINDRICAL LOCK AND LATCH SETS** – Best 93K x 150 x NON-IC PREP or Schlage standard prep (no substitutes), with cylinder and tailpiece as required for keyed functions. No interchangeable cores. Unless otherwise noted, all cylinders shall be furnished and keyed by the Contractor, meeting required schedule and conforming to the LPS Keying Diagram, as coordinated with the **LPS** locksmith.
 - a – Standard lock/latch functions shall be specified as appropriate for each project/door and coordinated with the **LPS** locksmith, as follows:

<u>Lock Type</u>	<u>Lock Function</u>
AB	Entrance Lock of Office (for classrooms)
D	Storeroom Function
IN (Best, only)	Intruder Function (required at all classrooms)
N	Passage
L	Privacy
 - b – **Cylinders** shall be KABA Peaks or Medeco K3 cylinders or match existing (as determined by the **LPS** locksmith), with mortise and cam required; rim and tailpiece or lockset and tailpiece as required.

- 06 – **CYLINDRICAL DEADBOLTS** – Marks 130 Series, with cylinder and tailpiece as required for keyed functions; finish to be coordinated with the **LPS** locksmith at the time the specification is written.
- 07 – **EXIT DEVICES** – Precision 2100 Rim Series with lever handles to match lockset design as required to meet ADA guidelines and KR822 keyed removable center mullion where required. All other requirements as for Lock and Latch sets.
 - a – Escutcheon with Standard Pull 1700A Series where applicable
 - b – Escutcheon with Lever 4900 Series where applicable
 - c – "FL" fire rated devices at label openings
 - d – "SNB" Sex Nuts and Bolts at labeled doors as required
 - e Detex 10 Series as alternate with 08D trim
- 08 – **CLOSERS** – LCN 4040XP EDA closers (preferred) or Stanley D-4550 EDA (alternate) (no substitutes) at all doors with EDA parallel arm and 90-degree or 180-degree hold-open as appropriate. Ten-year guarantee against mechanical failure. All door frames to be reinforced for closers, with "SNB" Sex Nuts and Bolts at labeled doors as required.
- 09 – **STOPS AND HOLDERS** – Allow for maximum swing of doors. Trimco or Rockwood floor or wall stops, as follows:
 - a – **Floor stops** shall be Trimco 1211 or Rockwood 441
 - b – **Wall stops** shall be Trimco 1270VW (Concave) / 1270WX (Convex) or Rockwood 409 (Concave) / 406 (Convex)
- 10 – **STRIPS AND SEALS** – Pemko or equivalent from National Guard, as follows:
 - a – **Weather seals** - Pemko 309 AP at head and jambs, all exterior doors and interior vestibule doors
 - b – **Smoke seals** - Pemko S88
 - c – **Sound seals** – Double row of Pemko S88 (primarily at Music Rooms)
 - d – **Light seals** – Pemko 379 S at head and jambs, with door bottom and threshold as required (primarily at Dark Rooms)
- 11 – **THRESHOLDS AND SWEEPS** – Pemko or equivalent from National Guard, as follows:
 - a – **Thresholds** - Pemko 272A (1/4"x6" saddle threshold)
 - b – **Door sweeps** – Pemko 18062 NB (interior) or 345 NB (exterior)
- 12 – **FLUSH BOLTS** – Not desired for use at **LPS** facilities.
- 13 – **PULLS AND PUSH PLATES** – Trimco or Rockwood, as follows:
 - a – **Pull plates** - Trimco 1010 3/4"x16" or Rockwood 132 x 70C 4"x16".
 - b – **Push plates** - Trimco 1001 3/4"x16" or Rockwood 70C 4"x16".
- 14 – **KICK PLATES** – Trimco K0050 10" high or Rockwood K1050 10" high.
- 15 – **SILENCERS** – Corbin, Glynn-Johnson, Russwin.
- 16 – **PADLOCKS** – Master 1K keyway, Rekeyable ProSeries laminated or steel case; only as directed by **LPS** locksmith.
- 17 – **SLIDING, POCKET HARDWARE** – Grant, Lawrence, Stanley.
- 18 – **BIFOLD HARDWARE** – Grant, Lawrence, Stanley.
- 19 – **ELECTRIC STRIKES** – H.E.S. (no substitutions) as follows:
 - a – 9600 at non-rated exit device applications
 - b – 9500 at rated exit device applications
 - c – 8300 at rated exit device applications
- 20 – **AUTOMATIC DOORS** – Where required at ADA specified locations or as directed by **LPS**, Electro-Mechanical Automatic Operators shall be low-energy heavy-duty devices, either Stanley D-4990 Series or LCN 4642 Series with parallel arm and wall-plate actuator Model 956.

- a – Actuation - IEI Easy Touch 0291400; no substitutions.
 - b – Activate/Deactivate Key Switch – Compx SW2-3118AD KA221 for touch-pad and electric strikes; no substitutions.
- B – **HARDWARE SUPPLIER** shall have in his employ a member of the American Society of Architectural Hardware Consultants (AHC) who will directly supervise the scheduling, detailing, marking, and delivery of hardware. All installations must meet ADA requirements. Hardware (and keying, if assigned to supplier) must be approved by the **LPS** locksmith in pre-construction meeting with hardware supplier before submittals and schedules are released for ordering.
- C – **SECURITY** – Certain parts of the building shall be secured from use by unauthorized persons. Mechanical and Electrical Equipment Rooms, Offices and Storage Rooms, Kitchen Areas, Attic and Crawl Spaces and Roofs are to be locked against access by students. Corridor fire-doors and isolation doors/gates should also be similarly secured, as permitted by applicable Code and AHJs.
- D – **COMMUNITY USE** – Some areas of a building may be available for community use during non-school hours. In order to confine traffic only to designated areas, it may be necessary to provide metal gates at certain points in Corridors. Since gates cannot be used at Stairways to restrict access to upper floors, locking exit devices will be required at certain stair doors. Location(s) of both corridor gates and exit devices must be carefully studied to meet requirements of each building/addition and Building Code.
- E – **THREE BUTT HINGES** (1-1/2 pair) minimum are required on each door/leaf.
- F – **BUILDING ADDITIONS** –
 - 01 – **HARDWARE FOR ADDITION(S)** to existing buildings shall be similar in design to the original hardware, except that **cylinder locks** shall be the type described elsewhere in this guide specification, rather than mortise locks.
 - 02 – **REPLACEMENT** – If an addition to an existing building is of substantial size or if the old hardware is obsolete or inadequate, it may be feasible to replace existing locks or cylinders with new hardware, as shall be determined by the **LPS Operations, Maintenance and Construction (OMC) Department**.
- G – **MISCELLANEOUS HARDWARE** required for window screens, windows, metal lockers, toilet compartments, metal-clad fire doors, rolling grilles, access doors, hatches, and roof scuttles is to be furnished with those items.
- H – **CABINET HARDWARE** – Drawer extension glides, sliding door hangers, and track, sheaves, guides, stops, shelf standards, and support brackets shall be furnished and installed with the Millwork. Lockable cabinets and drawers will use Compx National C8050 Series cam-locks with D8785 keyway (no substitutes) and will be keyed alike per area, or per cubicle in the case of multi-station offices.
- I – **KEYING** –
 - 01 – **KEY REQUIREMENTS** shall be coordinated with the **LPS** locksmith, who will coordinate with the building Principal as appropriate. Keying and master-keying shall conform to the **LPS** Keying Diagram furnished by the Locksmith, except as otherwise directed in writing.
 - 02 – **TWO KEYS** are to be furnished with each lock, with additional keys as directed by the **LPS** locksmith. Note: This excludes telecom rooms (MDF or IDF), which shall be accessible via master keys only by LPS Security and ITS Department personnel.

- 03 – HARDWARE SUPPLIER** will furnish key cut numbers for each key to the **OMC Department**.
- 04 – NEW KEYING** will be cut to code only using the existing system.
- J – MAINTENANCE MANUAL** – Furnish three copies of Maintenance Manual covering Finish Hardware for each project. Each manual should consist of printed sheets from the hardware manufacturer, bound in a three-ring binder and properly indexed. A biting schedule shall be included for master keying.

08 79 00 – HARDWARE ACCESSORIES –

- A – KEY CABINET** – For new buildings or substantial additions to existing buildings, as determined by the **LPS Operations, Maintenance and Construction (OMC) Department**, provide Telkee AWC wall-mounted series, dual key tag cabinet with total capacity 50% over current lock quantity.
- B – FIRE DEPARTMENT LOCK BOX** – At each building over 5,000 gross square feet, provide recess-mounted, dual-lock, black Knox-Box model 3200 series, without tamper switch, as manufactured by the Knox Company, Phoenix, AZ. Top cylinder shall be keyed to local fire/rescue department; bottom cylinder shall be keyed as directed by LPS locksmith.

08 80 00 – GLAZING – Provide glass and plastic glazing for exterior and interior windows, doors, transoms, entrances, storefronts, sidelights, skylights, window walls, curtain walls, spandrels, borrowed-lite panels, fixed glazed panels and unframed mirrors with associated anchorage accessories, to be coordinated with the **LPS Operations, Maintenance and Construction (OMC) Department** for each project/building. Related Sections include: 08 50 00 – Windows; 08 54 13 – Fiberglass Windows; 08 60 00 – Roof Windows and Skylights.

- A – GENERAL** – New glass, best grade of respective kind, free from flaws, up to grade requirements; each individual piece bearing a label which shall not be removed until professional cleaners have cleaned glass.
- B – EXTERIOR GLAZING** – Type and thickness required by location to meet Code requirements; insulating in exterior doors and windows. All exterior glazing shall be double-pane insulating glass, with tints and/or coatings as determined by the **A/E** and the **OMC Department**.
- C – INTERIOR GLAZING** – Wire glass for fire-rated openings, or as required by Code; safety- or wire-glass for all other openings; polycarbonate (Lexan) at gym office windows as approved by **LPS** and the AHJ; thickness of material as recommended by glass manufacturer for size of opening; one thickness throughout, if possible.
- D – CODE REQUIREMENTS** – Glazing shall comply with Code and applicable portions of Colorado HB No. 1110 concerning safety of glazing materials in hazardous locations.
- E – VISION STRIPS** – Required in all doors except Rest Rooms and Storerooms; wire or tempered glass; minimum 6" above panic bars; upper half of door only.
- F – MISCELLANEOUS –**
 - 01 – GLAZING SEALANT** – Silicon rubber, one part elastomeric; acid type for nonporous channel surfaces, nonacid type for porous channel surfaces.

- 02 – **GLAZING GASKETS** – Black molded or extruded neoprene of profile and hardness required for water tight construction; complying with ASTM D2000, 2BC 415 to 3BC 620.
- 03 – **GLAZING TAPE** – Closed cell, flexible, self-adhesive, nonextruding polyvinyl chloride foam; recommended by manufacturer for exterior, exposed, water tight installation of glass, with only nominal pressure in glazing channel; complying with ASTM D1667.
- 04 – **SETTING BLOCKS** – Neoprene, 70-90 durometer hardness, proven compatible with sealants used.
- 05 – **SPACERS** – Neoprene, 40–50 durometer hardness, proven compatible with sealants used.
- 06 – **COMPRESSIBLE FILLER ROD** – Closed cell or waterproof jacketed rod stock of synthetic rubber or plastic foam, proven compatible with sealants used, flexible, resilient with 5–10 psi (0.35–0.7kg/cm²) compression strength for 25% deflection.
- 07 – **CLEANERS, PRIMERS, SEALERS** – Type recommended by sealant or gasket manufacturer.

08 90 00 – LOUVERS AND VENTS – Operable louvers and vents shall be tool-adjustable only.

★ END OF DIVISION 08 ★

DIVISION 09 – FINISHES

09 21 00 – GYPSUM BOARD SYSTEMS – Shall meet requirements of National Gypsum Association; typically one-hour fire rated throughout; water-resistant W/R on wet plumbing walls and all walls (not ceilings) in wet or damp areas such as restrooms, toilets, janitor closets, kitchens. DUROCK Tile Backer Board is an acceptable alternate to W/R board on wet walls and in wet or damp areas, provided it meets fire-resistive requirements and provided no extra cost(s) charge(s) to Owner. Neither W/R nor DUROCK type is an acceptable substitute for gypsum sheathing or Exterior Gypsum Ceiling Boards. In high school lobbies and corridors, gypsum board shall be fiberglass-reinforced, or 1/4" plywood or other backing shall be installed, to resist vandalism.

09 22 26 – PLASTER AND GYPSUM BOARD CEILING SUSPENSION SYSTEMS –

- A – ACOUSTICAL EXPOSED GRID SYSTEM** – Standard exposed one-hour rated, cold-rolled steel T-grid system with hold-down clips, matching wall angle moldings, standard baked enamel finish color selected by the **LPS Operations, Maintenance and Construction (OMC) Department**, all items same width of exposure.
- B – DRYWALL SUSPENSION SYSTEM** – Chicago Metallic FIRE FRONT 650 or Roblin RIGID "X" sheet steel, hot dipped, electro-galvanized or painted, minimum one-hour UL fire-rated system.

09 23 00 – GYPSUM PLASTER SYSTEMS – Metal lath, white gypsum base and Keene finish; total three-coat plaster, with associated accessories.

09 24 00 – PORTLAND CEMENT PLASTER SYSTEMS – Metal lath and three-coat cement plaster (stucco) on cold-formed stud/joist framing, masonry, or metal suspension system, with associated accessories.

09 30 13 – CERAMIC TILE –

- A – WALL TILE** – ANSI A137.1, Section 6.1; types, finishes, sizes, patterns, colors, settings, approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.
- B – FLOOR TILE** – ANSI A137.1, Section 5.1; types, finishes, sizes, patterns, colors, settings, approved by the **OMC Department**.
- C – TRIM AND SPECIAL SHAPES** – Rounded external out-corners; bullnose end cap trim shapes at head, jamb, sills of openings and terminations; coved base and inside corners; same material, size, finish as wall tile.
- D – MAINTENANCE MATERIAL** – Three percent (3%) in full-size units for each type, style, shape, size, pattern and color, delivered to the Owner for storage on-site or as directed.

09 30 16 – QUARRY TILE –

- A – FLOOR TILES** – ANSI A137.1; types, finishes, sizes, pattern, colors, settings, approved by the **LPS Operations, Maintenance and Construction (OMC) Department** to fulfill design requirements.

- B – **BASE TILES** – ANSI A137.1; types, finishes, sizes, colors, settings, determined by the A/E to fulfill design requirements; bullnose outside corner units, coved inside corner units.

09 51 00 – SUSPENDED ACOUSTICAL CEILINGS

- A – **SUSPENSION GRID** – Armstrong Prelude XL white, 15/16” wide x 3/4” high, direct hung, minimum Intermediate Duty; or equivalent by USG or Chicago Metallic.
- B – **ACOUSTICAL TILE** – Armstrong Cortega Fire Guard white, square-edge, minimum 5/8” thick; or equivalent approved by **LPS Operations, Maintenance and Construction (OMC) Department**.
- C – **MAINTENANCE MATERIAL** – Three percent (3%) in full-size units for each type, style, size, pattern and color of suspension system and tile.

09 63 13 – MASONRY BRICK FLOORING

- A – **PAVER UNITS** – Split type in sizes, colors, and settings approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

09 63 40 – STONE FLOORING – Natural granite, marble, slate, flagstone; in shapes, sizes and settings approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

09 64 23 – WOOD PARQUET FLOORING – Natural or plastic impregnated in sizes, species and finishes approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

09 64 29 – WOOD STRIP AND PLANK FLOORING – Size(s), Species, finish(es), fastening(s) as approved by the **LPS Operations, Maintenance and Construction (OMC) Department**; strips tongued and grooved and end matched.

- A – **ADHESIVE** – Type recommended by flooring manufacturer, complying with flammability and environmental control regulations.
- B – **ASSOCIATED WOOD TRIM** – Same species and cut as flooring.

09 65 00 – RESILIENT FLOORING – Asbestos- and formaldehyde-free tile or sheet material acceptable to the **LPS Operations, Maintenance and Construction (OMC) Department** in sizes, colors, patterns, textures, and locations approved by the **OMC Department**. Base shall be rubber, top-set cove with preformed interior and exterior corners.

- A – **WAX** – Clear, non-fade, nonslip type as manufactured or recommended by flooring manufacturer.
- B – **MAINTENANCE MATERIAL** – Deliver to the Owner for storage on-site a minimum amount of three percent (3%) in full size units/sheets for each type, pattern and color of resilient flooring and accessory.

09 65 66 – RESILIENT SPORTS FLOORING – Gymnasium flooring at all elementary schools (and elsewhere as directed or approved by the **LPS Operations, Maintenance and Construction (OMC) Department**) shall be synthetic sheet material specifically designed for adhered athletic flooring applications.

- A – PREPARATION** – Concrete surfaces shall be prepared for flooring installation in accordance with ASTM F710, F1869 and F2170, and per manufacturer's instructions.
- B – MATERIALS** – Sheet flooring with backing shall comply with ASTM F1301: wear-layer thickness Grade 1; overall thickness minimum 5.0mm; foamed plastic interlayer material; backing Class C (foamed plastic); roll size not less than 72 inches (1219mm) wide by longest length practical to minimize splicing during installation.
- C – SURFACE FINISH** – Factory-applied UV urethane finish with embossed traffic-surface texture; color and pattern as selected by the A/E and the **OMC Department** from manufacturer's full range.
- D – INSTALLATION** – Seams shall be heat welded in compliance with ASTM F1516.
- E – ACCEPTABLE MANUFACTURERS** – Subject to compliance with requirements, provide products by: Tarkett Sports, Johnsonite, Connor Sports Surface Solutions, Gerflor or other as acceptable to the **OMC Department**.

09 67 00 – FLUID-APPLIED FLOORING – Seamless, fluid-applied, high-build (broadcast or slurry), non-absorptive and non-porous, chemically inert flooring system with integral cove base and medium slip resistance, in minimum ¼" finished thickness. Pre-approved products include General Polymers FasTop S Urethane Slurry System and BASF SRS Degadur CF Double Broadcast Flake System; proposed alternates must be accepted by **LPS** at time of bidding.

09 68 00 – CARPETING – Modular preferred (Mannington, Milliken or equal as approved by LPS), but sheet goods acceptable if pre-approved by **LPS**. Tufted loop pile (no cut-pile) with solution-dyed nylon fiber and reinforced man-made composition backing, including permanent anti-static and anti-microbial protection and fluorocarbon soil-resistant treatment. Minimum standards: pile yarn weight of 20 oz. per square yard; finished pile thickness (per ASTM D418) of 0.094 inches; 1/10 gauge; 9.0 stitches per inch; Average Pile Yarn Density of 5333; total product weight of 85 oz. per square yard; minimum width of 24 inches (modular) and 72 inches (sheet).

- A – PREPARATION FOR INSTALLATION** in new or remodel areas shall be the responsibility of the Contractor.
- B – WARRANTY** – Limited lifetime (minimum 20-year) non-prorated warranty (including edge ravel, dimensional stability, cushion resilience, delamination, static protection).
- C – BACKING** shall be man-made, non-absorbent composition material, condensed at offices or high-traffic areas and closed-cell cushioned at classrooms or other instructional areas. Backing shall be reinforced for dimensional stability and shall be permanently anti-static.
- D – YARN** shall be continuous filament, plied and heat-set, using Type 6,6 nylon fiber (DuPont or Monsanto preferred), with a cationic polymer additive at extrusion for enhanced stain resistance.

- E – **ADHESIVES**, whether factory-applied to backing or field-applied, shall be free of hazardous chemical emissions within 24 hours after installation.
- F – **SEAMING** of sheet goods shall be solvent-based, chemical-fusing, with no hazardous chemical emissions continuing more than 24 hours after installation.
- G – **TESTING**: Class 1 Flammability (Radiant Panel, ASTM-E648, >0.45); NBS smoke density < 450, flaming mode (NFPA-258-T or ASTM-E-662).
- H – **ANTIMICROBIAL PROTECTION** shall be permanent, for both face of carpet and backing, meeting GSA Requirements with 15 washings. (GSA Protocol - AATCC138; AATCC174 Part I or II, and Part III.)
- I – **INDOOR AIR QUALITY** – Meets CRI Green Label Plus.
- J – **SUSTAINABILITY** – Minimum NSF-140 Gold.
- K – **MAINTENANCE MATERIAL** – Deliver to the Owner for storage on-site or as directed all carpet scraps larger than 48 inches in length by 24 inches in width, and furnish an overrun in the amount of three percent (3%) in full-width for each type, pattern and color/dye-lot.

09 72 00 – WALL COVERINGS, including vinyl and upholstered fabric wall coverings, wrapped wall panels, wallpaper, flexible wood sheets, for approval and acceptance by the **LPS Operations, Maintenance and Construction (OMC) Department**.

09 80 00 – ACOUSTICAL TREATMENT –

- A – **A 42 SOUND TRANSMISSION COEFFICIENT (STC)** minimum value shall be provided in noncritical areas such as Kitchens, Classrooms, Corridors and Athletic Facilities.
- B – **A 55 STC** minimum value shall be furnished in critical areas such as Conference Rooms, Private Offices, Band Rooms and Vocal Rooms.
- C – **NONACOUSTICAL AREAS** include Storage Rooms, Mechanical Equipment Rooms, Janitor (Custodian) Rooms and Stairwells.
- D – **LAY-IN PANELS** – Size(s), finish and ratings as approved by the **LPS Operations, Maintenance and Construction (OMC) Department** and to meet local Code requirements.

09 90 00 – PAINTING AND COATINGS – Provide coatings for normally painted/stained exterior and interior surfaces including gloss, semi-gloss, flat paints; transparent or opaque finishes; water or solvent-based coatings; stains, primers, fillers, waxes, and preparation of surfaces to receive coatings. Furnish all formulas to the **LPS Operations, Maintenance and Construction (OMC) Department**. Preferred brand(s) to be designated by the **OMC Department**.

- A – **SAMPLES** – Furnish for approval minimum 12" by 12" samples of surface(s) to be painted or finished. Paint as specified shall be applied in manner clearly indicating degree of finish at various stages of completion, with succeeding coats overlapping previous coats, taking care to establish a definite line of demarcation. Samples, when approved, will become standard of comparison, and finished surfaces not equal to sample color shall be refinished at Painting Contractor's expense.

- B – PAINT AND STAIN** shall be manufacturer's best, top-of-line commercial grade, type, kind available (commercial and/or residential low grades not acceptable); manufacturer, supplier or installer shall furnish written certification thereof to the **GC, A/E** and **LPS** prior to and upon delivery of materials to jobsite. Acceptable products shall be from those manufactured by Samuel Cabot, Benjamin Moore, Devoe, Pratt & Lambert, Martin Senour, Sherwin-Williams. Choice of products may be made in accordance with the LPS General Conditions of the Contract.
- C – MIXERS** – Materials not specifically designated, such as **linseed** oil, shellac, mineral spirits, turpentine; wood, masonry, and concrete fillers, shall be recommended quality products of known manufacturer which will perform as required for specific surface.
- D – COLORS** will be selected by the **OMC Department** from manufacturer(s) complete catalog or brochure of factory-tinted colors. Apply only colors scheduled and approved.
- E – DOORS** – Regardless of door manufacturer prefinishing paint or stain, finish bottoms, tops and all edges of overhead, coiling, wood, and hollow metal swing, sliding and pocket doors, same as balance of door, after fitting.
- F – A PAINT SCHEDULE** shall be furnished to the **OMC Department** prior to application, covering painting and finishing of normally painted interior and exterior surfaces. Any surface not specifically listed herein but normally being considered a surface to receive paint, unless specifically excluded, will be painted or finished in identical manner as for comparable surfaces. Nonferrous metals, factory- or shop-finished equipment and materials, and other surfaces not normally painted will not be painted or finished, unless otherwise noted or specified.

« END OF DIVISION 09 «

DIVISION 10 – SPECIALTIES

10 11 00 – CHALKBOARDS, MARKERBOARDS AND TACKBOARDS shall be approved and accepted by the **LPS Operations, Maintenance and Construction (OMC) Department**.

- A – TRIM** – Extruded 6063-T5 standard satin anodized aluminum.
- B – COLORS** – Selected with **OMC Department** approval.
- C – COMPUTER AREAS** will incorporate use of porcelain boards and compatible accessories (no chalkboards permitted).

10 12 00 – DISPLAY CASES – Where required, shall be safety glass-fronted with lockable sliding access panels, tackable rear surface and adjustable tempered glass shelves.

10 13 00 – DIRECTORIES – Typically not required at **LPS** facilities. If desired at a new building or remodeled front entry, coordinate with the **LPS Operations, Maintenance and Construction (OMC) Department**.

10 14 00 – SIGNAGE AND IDENTIFYING DEVICES – Provide signs at entrances to all occupiable spaces (e.g., not coat closets or fully-shelved storage rooms) in buildings, including signs for the handicapped, per typical LPS signage details. NOTE: Except as directed by the **LPS Operations, Maintenance and Construction (OMC) Department**, additional signs are not required at connecting doors between classrooms or other signed rooms.

- A – ROOM IDENTIFICATION** – All occupiable rooms or public spaces within LPS facilities shall be named and numbered in accordance with the following conventions. The A/E shall confirm correct room numbers/names for each building and shall coordinate names and numbering for added or remodeled spaces with the **OMC Department**.
 - 01 – Numbering** – To standardize room numbering and coordinate data-based systems (building automation, tele/communications, fire alarm, security), room numbering should adhere to these guidelines:
 - a** – Each facility's room numbering system shall be structured so that numbers flow through the building in a consistent, comprehensible pattern. Numbering patterns shall be clear to staff, students and visitors, minimizing confusion for individuals attempting to locate spaces. During renovations or building additions, all re-numbering of rooms shall be consistent with existing numbering of adjacent spaces.
 - b** – The first digit of a corridor or room number indicates the floor on which the room is located.
 - (1)** The main entry level, entered at or near grade, shall be designated floor number 1.
 - (2)** An at-grade accessible floor below the main entry level shall be designated floor number 0.
 - (3)** Floors (including roof or penthouse levels) above the main entry level shall be designated floor number 2, number 3, etc.
 - c** – Corridors shall be numbered in rising order starting left of the main entry and proceeding first left to right, then outward from the main entry. Generally, north-

south corridors should be even numbered (20s, 40s, etc.) and east-west odd (10s, 30s, etc.) or vice versa within a given building.

- (1) All corridor numbers shall end in 0 (e.g., C140), except for smaller branch or dead-end corridors, which may end in 5 (e.g., C145).
 - (2) Corridors shall be numbered consistent with the room numbers along a given corridor in order to distinguish that corridor and set of rooms from others—e.g., a main floor corridor serving rooms from 01 (or 11) through 19 should be numbered C110; the next corridor, serving rooms from the 20s into the 30s should be numbered C120 or C130; etc.
 - (3) A continuous corridor, regardless of length or configuration, shall keep the same number. If a corridor is “sectioned” by a 2-hr door closure, or if separate sections serve distinctly different areas of the building, the corridor sections may be assigned different numbers or have alpha suffixes referencing compass direction (E or W, N or S). If a corridor is entered at or near its mid-point (e.g., from the main lobby), each section may be given a different number to facilitate room numbering sequences in each section.
 - (4) Vestibules, lobbies and stairways are considered to be part of the corridor to which they connect and shall be labeled with an appropriate letter prefix followed by the corridor number and a letter suffix showing the space’s compass location relative to the corridor—e.g., V110E would be the vestibule at the east end of corridor 110.
 - (5) After corridor numbers are designated, no room shall have the same number as a corridor.
- d – Room numbers will be 3 or 4 characters long, except as follows:
- (1) Smaller buildings (e.g., elementary schools) with less than 100 rooms per floor will have 3-digit numbers plus letter prefixes and/or suffixes as noted.
 - (2) Larger buildings (e.g., middle and high schools) with over 100 rooms per floor will have 4-digit numbers plus letter prefixes and/or suffixes as noted.
 - (3) Letter prefixes to designate special room type or function:
 - (a) Spaces affording movement through them will have a letter prefix by type, as follows:
 - C Corridor (not “hallway”)
 - V Vestibule (with an airlock between interior and exterior)
 - L Lobby opening off a corridor or vestibule
 - ST Stairway (followed by a corridor number plus N, E, S or W)
 - EV Elevator
 - (b) Service spaces, whether directly accessible from a corridor/lobby or within a suite, will have a letter prefix designating their type of service, as follows:
 - R Restroom
 - J Custodial, including service storage
 - M Mechanical or Electrical room
 - T Telecom room (MDFs shall begin with TA; IDF’s with TB, TC, etc.)
 - U Utility chase, tunnel or accessible crawlspace
 - (c) Rooms accessible only from the exterior will begin with an X.
 - (d) Modular classroom buildings will be numbered beginning with XP
 - (4) Letter suffixes:
 - (a) Rooms within a suite of rooms and not directly accessible from a corridor or lobby will have letter suffixes. See e(7) below.

- (b) Rooms with direct access to the building exterior will end in X.
 - (5) No dashes or other punctuation shall be used in room numbers.
- e – Per d(1) and d(2) above, the 2 or 3 digits after the corridor number will designate the room.
 - (1) Room numbers should be assigned with odds and evens on opposite sides consistently in each corridor from one end to the other, except that numbers in dead-end corridors may run down one side and back the other.
 - (2) First rooms on a corridor should end in a 1 or a 2, other rules permitting.
 - (3) Room numbers across a corridor from each other should roughly match—e.g., 125 should be across from 124 and/or 126.
 - (4) To the greatest extent possible consistent with other rules, rooms with the same final 2 digits should be located in the same position in the building—e.g., rooms 055, 155 and 255 should roughly align vertically.
 - (5) Skip numbers as appropriate to adhere to e(3) and e(4) above or to reserve numbers for future use—e.g., to allow for renovations that divide larger spaces into multiple rooms. Having numbers in reserve will avoid the need to renumber an entire level later on.
 - (6) Each room shall have only one number, regardless of the number of doors opening into it, even from differently-numbered corridors.
 - (7) Rooms that are part of a suite entered from a corridor or lobby by the same primary door will share the same room number with an added letter suffix.
 - (a) Rooms accessed only from within a suite are numbered with the entrance room number plus an letter suffix, usually beginning with the room immediately left of the main entrance and proceeding alphabetically clockwise—e.g., rooms accessed only through 122 would be numbered 122A, 122B, 122C, etc.
 - (b) Rooms accessed only from within a suite-accessed room are given a 2nd letter suffix—e.g., 122BA, 122BB, 122BC, etc.
 - (c) The letters O and I are not used in suite room lettering.
 - (d) Cubicles or work stations in large open rooms shall be designated in the same manner as rooms within a suite, using the whole number of the room where the cubicle is located followed by an letter suffix.
 - (e) Cubicles or benches located in rooms already having a letter suffix shall be designated by the room number followed by an added number (122B1, 122B2, 122B3, etc.).
- f – All accessible spaces shall be numbered, including covered exterior spaces (walled or not) but excluding coat closets, etc., of less than 10 square feet.
- 02 – Naming** – For consistency throughout the District, and especially to clarify for emergency responders the nature and likely occupancy of rooms, names of similar rooms and common spaces should adhere to these guidelines:
 - a – Main Office or Admin Offices
 - b – Health Services or Health (not Clinic, Nurse’s Office, etc.)
 - c – Staff Room (not Teacher or Staff Lounge, Lunchroom, Dining, etc.)
 - d – Cafeteria, or Cafetorium when a stage or platform is attached/adjacent
 - e – Gymnasium, with or without a stage/platform (not Gym)
 - f – Multipurpose Room shall not be used, except for a separate space in addition to a Cafeteria/Cafetorium and Gymnasium.
 - g – Commons, Student Center or other traditional name for casual gathering area
 - h – Stage if the space is fully Code-compliant as such, Platform if not compliant
 - i – Custodian/Custodial (not Janitor/Janitorial); variation: Building Facilitator

- B – INTERIOR WALL SIGNS** – Wall plaques with dimensional letters identifying room by number (and by name, for scheduled common/public spaces) as approved by the **OMC Department** per LPS standards herein and graphic details provided. The A/E shall confirm correct room numbers/names for each site with the **OMC Department**. See typical LPS details.
- 01 – Graphics** – Letters, numbers and symbols on interior signs shall be white Helvetica Neue Regular (upper case only) on a solid background of “Reflex Blue” (matching District logo). Precision “Routed Time-Bond System” is required, with raised Grade 2 Braille dots, per ADAAG guidelines.
 - 02 – Materials** – Interior signs shall be acrylic (ASTM D4802, Type UVF), minimum 0.125 inches thick overall.
 - 03 – Fabrication** – Room numbers on all wall panels shall have fixed, raised characters and Braille dots, with fixed room names/identification below room number as scheduled. No changeable signs shall be provided, unless specifically authorized by the **OMC Department**.
 - 04 – Mounting** – Room signs shall be surface-mounted on corridor wall adjacent entry doors per ADAAG guidelines, using double-sided, tamper-resistant tape or, with prior approval by the **OMC Department**, following manufacturer’s written recommendation as appropriate for each mounting surface.
 - a** – Centerline of signs shall be at 8” from edge of door frame (or from interior corner adjacent the frame, in alcoves). Any significant variation due to atypical situations shall be coordinated with the **OMC Department**.
 - b** – Signs mounted on transparent surfaces shall have white vinyl backing on the back side of the glass or glass block, matching the sign size/shape.
 - c** – Signs for utility rooms (custodial, mechanical, electrical, telecom, elevator equipment) shall be mounted on the entry door at centerline, unless directed otherwise by the **OMC Department**.
- C – DOOR FRAME ROOM NUMBERS** – Plastic signs with printed room numbers shall be mounted on the exterior face of all room entry door frames at the top latch-side corner using permanent adhesive. To assist substitute teachers unfamiliar with a building, similar signs shall be centered on the interior face of all classroom entry door frames and on the exterior face of each classroom’s outside exit door frame.
- D – WAYFINDING SIGNS** – At lobbies, corridor intersections and other appropriate locations around each building, provide wayfinding wall plaques with fixed text and directional arrows identifying major common areas by name and/or groups of rooms by number range, as coordinated with the building staff and **OMC Department**.
- E – APPROVED VENDORS** – For interior signage: Image360, ASI Sign Systems, Avalis, Best Manufacturing or equal acceptable to the **OMC Department**.
- F – EXTERIOR SIGNS** – Cast aluminum dimensional letters with school name, post and panel/pylon, illuminated or non-illuminated, as approved by the **OMC Department**, to match existing signage at each building or as directed.

10 21 00 – TOILET COMPARTMENTS – Head rail braced flush panel type; flush doors and pilaster fronts; stall compartment door each stall; wall-mounted urinal screens; privacy (entrance and sight) screens as required. Compartments shall be Bobrick 1092 Sierra Series, or equivalent approved by

the **LPS Operations, Maintenance and Construction (OMC) Department**. No metal toilet compartments allowed.

10 22 00 – OPERABLE PARTITIONS:

- A** – Paired panels shall be top-supported, steel-faced with gypsum backing, nominal 4-in. thick, with interlocking vertical seals and mechanically-retractable bottom seals (min. STC 52 rating): Moderco Signature Series 8500, or equivalent approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.
- B** – Individual panels shall be top-supported, steel-faced with gypsum backing, nominal 4-in. thick, with interlocking vertical seals and mechanically-retractable bottom seals (minimum STC 52 rating), capable of turning 90 degrees for remote stacking: Moderco Signature Series 8600, or equivalent approved by the **OMC Department**.

10 26 00 – WALL AND DOOR PROTECTION

- A** – Resilient pre-formed corner guards are required at exterior corners of corridors and public area stud and gypsumboard partitions:
 - 01** – Acrovyn or **LPS**-approved equal, in color to match or complement wall finish.
 - 02** – Corner guards to match existing (if any), extending a minimum 4 feet high a.f.f.
 - 03** – Adhesive attachment typical; mechanical attachment at high-impact areas.
- B** – Metal corner guards (minimum 6 feet high) are required at exterior corners of delivery and material-handling areas, with stainless steel in kitchens (as determined by **Nutrition Services** and the **LPS Operations, Maintenance and Construction (OMC) Department**).
 - 01** – Mechanical attachment required, with wall-backing as appropriate.

10 28 00 – TOILET AND BATH ACCESSORIES – Dispenser-type accessories shall be as manufactured by Cormatic; other accessories shall be Cormatic, Bobrick or approved equal acceptable to the **LPS Operations, Maintenance and Construction (OMC) Department**.

- A** – **MARKED BROCHURES** shall be submitted by the Contractor for approval by the **OMC Department**, with accessories specifically intended for use on this Project clearly identified.
- B** – **MARKED TYPICAL DISPENSERS**, available without charge for LPS facilities from Hillyard/Denver (303-321-1227, attn: Melissa Loan) include the following:
 - 01** – Paper towel dispenser Model P-8 “Smoke”
 - 02** – Toilet paper dispenser Model S-4 “Smoke”
 - 03** – Soap dispenser Model L-1 “Smoke”
- C** – **GRAB-BARS AND RAILINGS** as required per ADAAG.

10 44 00 – FIRE PROTECTION SPECIALTIES –

- A – CABINETS** – Recessed or semi-recessed cabinets, as approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.
- B – EXTINGUISHERS** – Furnished and installed by the **OMC Department** as required by Code.
- C – WALL BRACKETS** – Extinguisher manufacturer standard material and design, provided by the General Contractor.

10 51 13 – METAL LOCKERS – Cold rolled mild annealed or leveled sheet steel; welded and ventilated; baked enamel finish in color(s) approved by the **LPS Operations, Maintenance and Construction (OMC) Department**; doors provided with lock hole filler to permit use of built-in key or combination lock; aluminum number plates with minimum 3/8" high embossed or etched figures near top of door. Nonrecessed and freestanding type lockers shall have sloped top and front and end closed bases.

- A – STUDENT LOCKERS** recessed in Hallways; masonry backup; located in manner easily supervised by Faculty.
- B – BENCHES** – Provide in Athletic Areas; clear hardwood tops finished with three coats plastic sealers; supported by steel standards finished in same color as lockers.

10 55 00 – POSTAL SPECIALTIES – Not typically required or used at LPS facilities.

10 75 16 – GROUND SET FLAGPOLES – 25' high, tapered aluminum complete with: ball finial; revolving, non-fouling truck; two sets of halyards, sheaves and cleats; collar, ground sleeve, ground spike and other fittings as required.

10 82 00 – METAL WALL GRILLES, SCREEN AND LOUVERS – Galvanized sheet steel or anodized aluminum.

★ END OF DIVISION 10 ★

DIVISION 11 – EQUIPMENT

11 40 00 – FOOD SERVICE EQUIPMENT –

- A – SCHEDULE** – Equipment, both **LPS-** and Contractor-furnished, shall be planned and scheduled on the Drawings, keyed to minimum ¼"=1'0" scale Kitchen Area Layout Plan and including for all equipment: description (manufacturer and catalog number), indication of who furnishes and who installs each item, rough-in location(s) and connection(s) required by Mechanical and/or Electrical Contractor(s).
- B – MULTIPLE USE** of Cafeteria must be considered in order to decrease idle time of area when it is not being used for meal service. Principal at each school shall be consulted to determine schedule for use of the Cafeteria for meal service. Cafeterias of up to 500 shall be at least 1,000 square feet.
- 01 – CAFETERIAS** shall be sized in proportion to school enrollment, as follows:
- a – up to 500** – Minimum 1,000 square feet
 - b – 501 and 600** – Minimum 1,500 square feet
 - c – 601 and 700** – Minimum 1,800 square feet
 - d – 701 and 875** – Minimum 2,450 square feet
 - e – 876 and 1000** – Minimum 2,800 square feet.
- 02 – CAFETERIAS** in schools with enrollment between 501 and 1,000 shall be available for meal service between hours 11:30 a.m. and 1:30 p.m.
- 03 – CAFETERIAS** in schools with enrollment over 1,000 shall be sized so 1/3 of student body can be seated at one time, allowing 14 square feet per student; and should be available for meal service between 11:00 a.m. and 1:00 p.m.
- C – SERVING LINES** shall be contained within the kitchen space with attention to traffic flow-through circulation from entrance and exit. Single point of sale shall be located at end of service line, with space for cashier and cash register with power source.
- 01 – Plans** shall assume:
- a – 1-LINE** – for enrollment of up to 400
 - b – 2-LINE** – for enrollment of 401 to 600
 - c – 3-LINE** – for enrollment of 601 to 800
 - d – 4-LINE** – for enrollment of 801 to 1,200
 - e – 5-LINE** – for enrollment of 1,201 to 1500
 - f – 6-LINE** – for enrollment over 1500.
- 02 – Elementary schools** – Each serving line shall consist of at least:
- a** – 4 hot-wells and a frost-top that services two (2) 18" x 26" sheet pans
 - b** – Adjustable sneeze guards for the frost-top and a pass-through between the hot-well and frost-top
 - c** – Top to be 14-gauge stainless steel with 18-gauge body
 - d** – Seams to be field-welded, with fill faucets integrated into the design
 - e** – All switches to be centrally located in a common control panel assembly. with removable front for ease of maintenance and service
- 03 – Secondary schools** – Each serving line shall consist of at least:
- a** – One 6-foot countertop refrigerated display unit with sliding door and lock unit
 - b** – One Hatco Glo-Ray 5-foot designed merchandising warmer
 - c** – One serving line with:
 - (1)** Four (4) hot/cold holding wells and a frost-top that services two (2) 18"x 26" sheet pans

- (2) Adjustable sneeze guards for the frost top and a pass through between the hot well and frost top
 - (3) Top to be 14-gauge stainless steel with 18-gauge body.
 - (4) Seams to be field-welded with fill faucets integrated into the design.
 - (5) All switches to be centrally located in common control panel assembly with removable front for ease of maintenance and service.
- 04 – Manufacturers** – Serving lines should be manufactured by Duke, with preference for their Expressions collection. All hot holding merchandisers should be manufactured by Hatco and all cold display units by Structural Concepts unless approved by **LPS Nutrition Services**.
- D – DRESSING ROOM(S)** with three full-length lockers per Serving Line; space, hookups and vents available for residential-sized top-loading clothes washing machine and front-loading clothes dryer located within six feet of Locker Room.
- E – CUSTODIAL CLOSET** with terrazzo receptor-type floor-sink in or closely adjacent to Kitchen, with space for cleaning chemicals, mop bucket, wringer and rack for four mops.
- F – EQUIPMENT AND SPACE REQUIREMENTS** for School Kitchens are outlined in U.S. Department of Agriculture Program Aid No. 1091, "Equipment Guide for On-site School Kitchens". Use space requirements outlined in that document, except as follows:
- 01 – WALK-IN REFRIGERATOR:**
- a – **72 square feet** for nonkindergarten enrollment up to 700
 - b – **89 square feet** for nonkindergarten enrollment 701 to 1,000
 - c – **96 square feet** for nonkindergarten enrollment 1,001 to 1,100
 - d – **105 square feet** for nonkindergarten enrollment 1,101 to 1,200
 - e – **140 square feet** for nonkindergarten enrollment over 1,201.
- 02 – WALK-IN FREEZER:**
- a – **92 square feet** for nonkindergarten enrollment up to 700
 - b – **132 square feet** for nonkindergarten enrollment 701 to 1,000
 - c – **145 square feet** for nonkindergarten enrollment 1,001 to 1,100
 - d – **158 square feet** for nonkindergarten enrollment 1,101 to 1,200
 - e – **211 square feet** for nonkindergarten enrollment over 1,201.
- G – WALK-IN REFRIGERATORS AND FREEZERS** shall be manufactured by Thermo-Kool.
- 01** – Adjust lengths of shelving sections to utilize all of the interior cooler space.
 - 02** – Galvanized finish on un-exposed exterior surfaces; Type 304 stainless steel finish on all exposed exterior surfaces; white stucco aluminum interior walls and ceiling.
 - 03** – NSF-listed assembly shall be 9'-0" overall from bottom of floor panels to top of ceiling panels.
 - 04** – 34" x 76" entrance doors with hardware, pilot lights and switch assembly, 14" x 24" view windows, foot treadles, one spring-loaded hinge per door, 48" aluminum tread plate, interior and exterior kick plates, dial thermometers and door strip heaters.
 - 05** – Type 304 stainless steel closure strips/trim as required between units and at walls, with stainless steel trim to conceal gap between top of unit and ceiling. Grain direction of all stainless steel is to match that of assembly exterior.
 - 06** – 120volt Component Hardware #VXS-100-PX vapor-proof lights with bulbs in each compartment; fixtures pre-assembled with wiring and conduit insulated against air passage and pre-wired, flush-mounted, 3-way switches with pilot lights and stainless steel cover plates, interior OSHA switches with constant "ON" pilot lights.
 - 07** – No exposed conduit inside assembly.

- 08 – Heated pressure relief port.
 - 09 – Compartments to have 4-1/2" diameter vapor-activated, remote bulb dial thermometers with flush chrome bezels, mounted at 5'-6" a.f.f. Extra length capillary shall be provided in aluminum conduit with bulb mounted in return air stream of evaporator coil on stand-off bulb brackets. Range of thermometer to be minus 40° F to plus 60° F in two-degree gradations. Wall penetrations shall have a 5" diameter stainless steel escutcheon plate sealed with clear silicone sealant.
 - 10 – Vaults must be installed by factory-trained, experienced mechanics, subject to approval of the District's Kitchen Consultant.
 - 11 – **Delivery and erection of vaults and installation and start-up of refrigeration system shall be performed by a Factory-approved and -supplied installer ONLY. Kitchen Equipment Contractor must submit to the District's Kitchen Consultant a list of qualified installers for approval prior to installation of vaults and refrigeration system.** Vault Installer shall check the work of Electrical Contractor and Refrigeration Installer, especially all wall penetrations and light fixture sealing, and provide one (1) year free service including parts and labor on refrigeration system and five (5) year warranty on condensing units.
- H – FREEZER/COOLER/DRY STORAGE SHELVING** shall be manufactured by Metro Max. Dry Storage shelving shall be provided in proportion to school enrollment, as follows:
- 01 – **210 square feet** for nonkindergarten enrollment up to 700
 - 02 – **300 square feet** for nonkindergarten enrollment 701 to 1,000
 - 03 – **330 square feet** for nonkindergarten enrollment 1,001 to 1,100
 - 04 – **360 square feet** for nonkindergarten enrollment 1,101 to 1,200
 - 05 – **480 square feet** for nonkindergarten enrollment over 1,201.
- I – KITCHEN, SERVING, STORAGE AND SERVICE AREAS** require one (1) outside door opening to a dock or delivery area and allowing safe pedestrian traffic during unloading.
- 01 – **STORAGE AREAS** shall be in close proximity to the outside door. Storage areas, including walk-in coolers, shall have one door opening into the Kitchen.
 - 02 – **KITCHEN CONTRACTOR** shall obtain approval of both Kitchen design and finished Kitchen by Tri-County Health Department and all other agencies which regulate the food service industry.
- J – KITCHEN EQUIPMENT** to be furnished and installed by the Contractor (as scheduled):
- 01 – **REFRIGERATED MILK CABINETS:** Mod-U-Serv model MCT-DM2 two-sided drop front milk coolers, mounted on casters.
 - 02 – **MOBILE CONDIMENT CART:** Mod-U-Serv Condiment Cart with the following:
 - a – Stainless steel construction with plastic laminate body panels
 - b – Stainless steel "V" bump tray-slide, to be an integral part of counter body
 - c – Server model SE-SS-07125 remote counter top dispensers, one (1) per side with stainless steel food product bag holders mounted inside the cabinet. Bag holders shall provide easy access for changing the product.
 - d – Cutouts for stainless steel silverware cylinders, with twenty-seven (27) cylinders for each unit
 - e – Cutouts for twelve (12) Cambro model 64CW-110 (BLACK) food pans per unit
 - f – Two (2) built-in San Jamar Model H2000TBKSS napkin dispensers
 - g – Lockable sliding stainless steel doors
 - h – Fully-capped six-inch back splash
 - i – Heavy-duty 5" plate casters with brake models at all corners of cabinet.

- K – MICROWAVE OVEN ON SHELF:** Amana RC-17 microwave oven with custom-fabricated stainless steel shelf sized to accept microwave oven selected.
- L – EXHAUST HOOD:** Gaylord Model HH-W-MAW-60 exhaust hood, all-welded 18-gauge Type 304 stainless steel construction, suspended from structure above, including:
- 01 –** UL-listed stainless steel baffle type filters and continuous drip trough
 - 02 –** Stainless steel perforated front discharge make-up air panels
 - 03 –** Recessed fluorescent light fixtures and lamps.
 - 04 –** Fan and light switches remote-mounted on wall by Electrical Contractor.
- Alternate:** Ventmaster or Avtec models of equal specifications may be considered, if submitted to the District's Kitchen Consultant for approval two weeks prior to bid opening.
- M – DOUBLE CONVECTION OVENS:** Blodgett model # DFG-200, including:
- 01 –** Six (6) racks per oven cavity
 - 02 –** Fan Delay/Pulse-Plus stainless steel fronts, sides, tops and enclosed backs; porcelain interiors
 - 03 –** Underhood flue diverter kit
 - 04 –** Electric continuous sounding buzzer with timers
 - 05 –** Doors to have dual pane thermal windows
 - 06 –** Adjustable bullet feet
 - 07 –** Dormont Model 1675KITBS48, 48" Gas connector kit, ¾" inside diameter, 48" long, with Supr-swivel couplings per unit stacked. DO NOT MANIFOLD OVENS.
- N – PROOFER/ WARMER:** Winston Model HA4522-HR-5 CVap Hold/Proof unit, with:
- 01 –** Differential control fan
 - 02 –** Fourteen (14) adjustable rack supports
 - 03 –** Doors hinged per plan, with windows on both doors
 - 04 –** Full perimeter bumper
 - 05 –** Four (4) five-inch casters, front two (2) to be locking
 - 06 –** Auto-fill option.
- G – DOUBLE STEAMER:** Groen Model (2)SSB-5GF steamer, including:
- 01 –** Groen SmartSteam™ Convection Steamer, double-stacked, open leg stand w/bullet feet; five (5)12 x 20 x 2-1/2" pans capacity per compartment; boiler-less; doors hinged right; stainless steel interior and exterior; single water connection.
 - 02 –** Natural gas; 62,000 BTU for each unit
 - 03 –** Everpure "KleenSteam" water filtration at steam generator supply line
 - 04 –** Dormont Model 1675KITBS48, 48" gas connector kit, ¾" inside diameter, 48" long, with Supr-swivel couplings. DO NOT MANIFOLD UNITS.
 - 05 –** Verify placement of Floor Trough to insure that steamer legs do not rest on grate.
- H – 40-GALLON TILTING SKILLET:** Groen Division/Dover Corporation Model #BPM-40E fry pan, with manual-tilting electric-heated unit; stainless steel exterior and legs; 9" deep pan with 2" tangent draw-off.
- I – RANGE:** Garland Commercial Industries Model #GFE24-4L 24" wide range with:
- 01 –** Four (4) burners with flame fail and spark ignition on all burners
 - 02 –** Single rear gas connection.

- 03 – Stainless steel front and sides, optional back panel and low-profile back guard
 - 04 – Space-saver oven with porcelain interior
 - 05 – Adjustable stainless steel legs 6" high
 - 06 – Dormont Model 1675KITBS48, 48" Gas connector kit, ¾" inside diameter, 48" long, with Supr-swivel couplings.
- J – UTILITY FAUCET WITH BRACKET:** Stainless steel wall bracket, including:
- 01 – T&S Brass Special Model No. 43-039 Assembly with two (2) 6-foot VB hose assemblies
 - 02 – Model B-0100 Spray Rinse with 68" braided stainless steel hose
 - 03 – Model B-102-A Pot Filler with 44" braided stainless steel hose.
 - 04 – T&S Model B-0166 hook assemblies.
- K – ICE MAKERS AND BIN:** Hoshizaki Model KM-500MAH-E ice-maker mounted on Hoshizaki Model B-300 stainless steel ice bin, with:
- 01 – Adjustable stainless steel legs 6" high
 - 02 – Everpure Insurice 2000 single water filter, with Model #K-10 coarse filter and one (1) six-pack of replacement cartridges for each filter
 - 03 – Cord and plug
 - 04 – Start-up and three (3) years parts and labor warranty, five (5) year parts on compressor and evaporator warranty.
- L – PASS-THROUGH REFRIGERATOR:** Traulsen Model RHT 1-32 WPUT pass-thru refrigerators with:
- 01 – Full-height doors, hinged per plan; glass on Kitchen side, solid on serving side
 - 02 – Ten (10) stainless steel wire shelves per section
 - 03 – Adjustable stainless steel legs.
- M – PASS-THROUGH HOT FOOD CABINET:** Winston Model HA4522-PT-HR-5 CVap Hold/Proof units, with:
- 01 – Differential control fan
 - 02 – Fourteen (14) adjustable rack supports
 - 03 – Pass-thru model, doors hinged per plan; half-height glass doors at Kitchen side, half-height solid doors at serving side
 - 04 – Adjustable stainless steel legs 5" high
 - 05 – Top cover extensions to match height of pass-thru refrigeration.
- N – SLICER ON STAND:** Hobart Model 1612 slicer with 12" stainless steel carriage tray; two (2) adjustable high fences; New Age Model #98001-B stand with locking casters.
- O – UTENSIL RACK:** Stainless steel pot rack assemblies at wall cap shelf as shown, with:
- 01 – 1-5/8" diameter stainless steel supports
 - 02 – Thirty (30) Component Hardware Model J77-4401 sliding double-prong pot-rack hooks
 - 03 – Component Hardware Model J95-2250 ¼" x 2" stainless steel rack band, fully-welded to supports and cross braced
 - 04 – Rolled ends: 9" radius top section, 4" radius mid-section
- P – UTILITY CARTS:** Metro Model MUC2442-35 three-tier mobile utility cart on casters.

- Q – FIRE SUPPRESSION SYSTEM:** Ansul Model No. R-102 Series systems installed in accordance with manufacturer's recommendations and in compliance with NFPA 96 for exhaust hood(s) as follows:
- 01** – Duct and plenum protection to hoods; surface protection to equipment below
 - 02** – Chemical cylinders located as indicated on drawings, with piping to hoods totally concealed. Exposed piping/fittings within cylinder location and exhaust hood to be chrome-plated or -sleeved with stainless steel tubing. Exposed pipe threads in and above food zone are not acceptable.
 - 03** – Remote manual releases located as shown on drawings
 - 04** – Electrical contactors as required for connection to school alarm system by others
 - 05** – Two (2) "K"-type handheld extinguishers mounted on brackets as per local code.
- R – HAND SINK:** Two (2) Eagle Group Model HSA-10-FE-T-MG wall-mounted hand-sinks with the following features:
- 01** – Electrically-powered, electronic-eye faucet and trash receptacle
 - 02** – Three (3) Georgia Pacific Model #59460 automated, touch-free towel dispensers with heavy-duty batteries as required; two (2) units at hand-sink locations and one (1) unit in the Kitchen restroom. Verify paper towel size with Owner.
 - 03** – Three (3) GOJO Model #2430-01 automated, touch-free soap dispensers with heavy-duty batteries as required; two (2) units at hand-sink locations and one (1) unit in the Kitchen restroom.
 - 04** – Two (2) FoodHandler glove racks with single service gloves, Model #11-0012, Eagle part #352855, for each of the units to be installed in the Kitchen area.
- S – THREE-COMPARTMENT SINK:** Three-Compartment Pot Sink as shown on drawings, with the following features:
- 01** – 14-gauge stainless steel sound-deadened tops, all vertical and horizontal corners coved, 12" high splash at walls and 3" high x 1-1/2" rolled rims having 1" radius on exposed corners, where shown. Cut top per plan and weld in disposer cone. Three (3) #14-gauge stainless steel coved sinks per plan, elevations and details.
 - 02** – Flat area on backsplash for T&S Brass and Bronze Works Model #B-0456-04 vacuum breaker; polished chrome plated with slip flanges for mounting to splash.
 - 03** – In-Sink-Erator Model #SS-150-B18-AS101 Disposer with 18" stainless steel disposer bowl, neoprene silver trap, scrap ring and splash guard. Aqua Saver control panel with stainless steel box mounted on custom bracket as detailed. K.E.C. to set water shut-off at 45 seconds unless otherwise specified.
 - 04** – T& S Brass and Bronze Works Model #B-0133 pre-rinse spray with Model #B-109 wall support.
 - 05** – Two (2) 3/4" splash-mount T&S Brass Model B-290 mixing faucets
 - 06** – Three (3) Component Hardware Model No. D53-7215 rotary drain with overflow and tailpiece
 - 07** – 16-gauge stainless steel fully-welded undershelves where shown, with clearance below soiled end counter section for two (2) Item #49 trash containers per plan.
 - 08** – 2" x 1/4" stainless steel band-constructed utensil rack supported on 1-5/8" O.D. stainless steel tubing formed as per detail; with Component Hardware stainless steel sliding pot hooks on approximately 8" centers; braced to wall as required for rigidity. One (1) #18-gauge stainless steel 8" wide overshef, with rear and ends coved up and capped, mounted to utensil rack support. Flat area to be provided on backsplash for sleeves of utensil rack supports.

- T – WORK TABLE:** One (1) open-base preparation sink/table as per drawings, 36” wide by length shown, with: sides turned down square with 1” radius corners; Type 304 stainless steel legs and gussets with adjustable bullet feet; no front cross rail, per plans.
Alternate: Advance/Tabco Spec Line or Universal Stainless Spec Line of equal specifications may be considered, if submitted to District’s Kitchen Consultant for approval two weeks prior to bid opening.
- U – VEGETABLE CUTTER:** Mannhart Model #M-2000 cutter with these plate accessories:
01 – One (1) #S2 slicer
02 – One (1) #S3 slicer
03 – One (1) #S5 slicer
04 – One (1) #S11 slicer
05 – One (1) #SH7 shredder
06 – One (1) #D14 dicing grid
07 – One (1) #J2X2 julienne slicer.
- V – CONDENSATE HOOD:** Gaylord Model VH2-W-48 condensate hood, all-welded 18-gauge Type 304 stainless steel construction, as follows:
01 – Size and shape per plan, mounted at 6’-6” a.f.f. K.E.C. to verify field-verify length and as-built wall dimensions and adjust length of hood for a fit of 1” tolerance.
01 – Fan switches remote to wall location, per plan
01 – Drain line extended behind equipment with stainless steel tubing and routed to nearest floor drain.
Alternate: Ventmaster or Avtec models of equal specifications may be considered, if submitted to District’s Kitchen Consultant for approval two weeks prior to bid opening.
- W – WORK TABLE WITH SINK:** One open-base preparation sink/table as per plans, with:
01 – Sides turned down 2” square with 1” radius corners; Type 304 s/s legs and gussets
02 – 18”x20”x10” deep sink compartment
03 – T&S Model B-0221 deck-mount faucet with swivel gooseneck faucet
04 – Component Hardware Model No. D53-7215 rotary drain with overflow and tailpiece
05 – 16-gauge stainless steel fully-welded undershelves where shown
06 – Two (2) Component Hardware Group Model S52 Series s/s drawer assemblies
07 – Space for mobile trash container and place for mounting Can Opener, as per plan.
Alternate: Advance/Tabco Spec Line or Universal Stainless Spec Line of equal specifications may be considered, if submitted to the District’s Kitchen Consultant for approval two weeks prior to bid opening.
- X – PREP SINK:** One open-base preparation sink/table as per plans, with:
01 – Sides turned down 2” square with 1” radius corners; Type 304 s/s legs and gussets
02 – Two (2) 20”x20”x10” deep sink compartments
03 – T&S Model B-231 splash-mount faucet
04 – Two (2) Component Hardware Model No. D53-7215 rotary drains with overflows and tailpiece.
05 – 16-gauge stainless steel fully-welded undershelves where shown
06 – Component Hardware Group model S52 Series stainless steel drawer assembly
07 – Space as shown for mobile trash container.
Alternate: Advance/Tabco Spec Line or Universal Stainless Spec Line of equal specifications may be considered, if submitted to District’s Kitchen Consultant for approval two weeks prior to bid opening.

- Y – WORK TABLE:** Open-base preparation sink/table as per plans: sides turned down 2” square with 1” radius corners; 6” high backsplash and fully-capped side splash, anchored to wall; Component Hardware Group Model S52 Series s/s drawer assembly.
Alternate: Advance/Tabco Spec Line or Universal Stainless Spec Line of equal specifications may be considered, if submitted to District’s Kitchen Consultant for approval two weeks prior to bid opening.
- Z – PAN RACK:** Six (6) New Age Industrial Model 4331 heavy-duty angle-ledge utility racks on 5” swivel casters with two brakes each. Lifetime warranty.
- AA – BAKER’S TABLE:** Tabco Model TBS-306 Baker’s Table w/MapleTex top and 16-gauge Type 304 stainless steel legs and stainless steel bullet feet; coved risers back and sides.
- BB – MOBILE INGREDIENT BINS:** Three (3) Rubbermaid Model 3602 mobile ingredient bins.
- CC – MIXER:** Hobart Corporation Model #HL300 mixer with standard accessory package, plus:
- 01 –** One (1) additional stainless steel bowl
 - 02 –** One (1) Bowl truck
 - 03 –** One (1) Ingredient chute
 - 04 –** One (1) Bowl scrapper
 - 05 –** One (1) Bowl splash cover
 - 06 –** One (1) “E” Dough hook
 - 07 –** One (1) “ED” Dough hook
 - 08 –** One (1) 9” vegetable slicer with adjustable slicer plate for #12 hub
 - 09 –** One (1) each plate holder assembly with 3/32”, 3/16”, 5/16” & 1/2” shredder plates
 - 10 –** Size base on enrollment: 30-quart for up to 600, 60-quart for 601 to 2,000.
- DD – MIXER ACCESSORY RACK:** Advance/Tabco Model SW-36 stainless steel utensil rack.
- EE – WALL MOUNTED FILLER FAUCET:** T&S Model B-605 Pot and Kettle Filler.
- FF – MOBILE TRASH CONTAINERS:** Eight (8) Rubbermaid Model 3517 combo Trash Container with lid and Model 3530 dolly for each container; color to be red.
- GG – UTILITY WALL SHELVING:** Amco shelving, including two (2) two-tier wall-mounted wire-shelf assemblies, 12”x72” and 12”x48”, in white epoxy finish, with cantilever-type shelves and mounting hardware. Verify shelving lengths with actual field dimensions.
- HH – WALL SHELF:** Universal Stainless wall-mounted shelving: one (1) WSD-7212 shelf.
Alternate: Advance/Tabco or Custom Fab.
- II – BREAD RACK:** By District’s Vendor.
- JJ – POT-WASHING MACHINE:** Meiko Model FV 130.2 Pot Washing Machine with:
- 01 –** Zero (0”) clearance on back and both sides. K.E.C. to trim side and back to wall with stainless steel trim; grain direction to match that of the machine.
 - 02 –** Built-in booster heater
 - 03 –** Pumped drain for both floor- and wall-drain applications
 - 04 –** Fully automatic fill, start and reset

- 05** – Self-cleaning cycle: automatic cleaning of wash chamber following shutdown of the machine
 - 06** – Stainless steel non-clogging wash and rinse arms
 - 07** – Integral wash tank soil removal system to maintain clean wash water and built-in temperature safeguards to guarantee washing and rinsing at minimum required temperatures regardless of incoming water temperature.
 - 08** – Water connection hookup to ¾" male garden hose fitting; furnish 48" stainless steel braided hose to plumber for installation in lieu of standard hoses provided.
- KK – WALL CAP SHELF:** Two (2) 16 gauge stainless steel wall cap shelves 16" wide, full length of wall; overhang ends ¾"; 2" square drop edge with 1" radius corners.
- LL – FLOOR-TROUGH WITH GRATE:** Four (4) complete assemblies of IMC/Teddy Model #ASFT "Anti-Spill" Floor Trough with the following features:
- 01** – Chemgrate heavy-duty Model FS series removable grate, 18" maximum length by width shown on plan
 - 02** – Anti-spill design, 14-gauge, 18-8 Type 304 stainless steel, fully-welded, coved-corner construction
 - 03** – Trough fitted with s/s waste cup and removable basket for 3½" waste pipe.
- MM – DUNNAGE RACK:** Two (2) New Age Industrial Model #2009 Dunnage Racks, 1-tier, 24"W x 60"L x 12"H, weight capacity 2000 lbs., all square-bar aluminum construction, fully heli-arch welded.
- NN – DUNNAGE RACK:** Four (4) New Age Industrial Model #2010 Dunnage Racks, 1-tier, 24"W x 48"L x 12"H, weight capacity 2500 lbs., all square-bar aluminum construction, fully heli-arch welded.
- OO – WALL CAP:** Fabricate one (1) 16 gauge stainless steel wall cap full length of wall. Overhang end and sides ¾". Provide 2" square drop edge with 1" radius corners. Butt to end with 1" turn up. Trim turn up to fit wall thickness and finish.
- PP – MOP ORGANIZER:** One (1) Unger Model HO700 organizer/tool holder, at 70" a.f.f.
- QQ – UTILITY FAUCET:** One (1) T&S Model B-0655-BSTP/R service sink faucet with built-in stops, vacuum breaker, lever handles, wall brace and chrome finish.
- RR – CLEAN-DISH STORAGE SHELVING:** Three (3) Lot Intermetro MetroMax Shelving: sizes, widths and lengths as per plan, four tiers high, each section with (4) 74PX posts. Confirm vault sizes and conform within nearest increment (3" maximum tolerance).
- SS – DISH-DRYING RACK:** Two (2) Intermetro Corporation Model #PR48VX2 mobile drying rack, including:
- 01** – MetroMax® Mobile Drying Rack Unit, 24"W x 48"L x 75-1/2" H, 4-tier, with 2 drop-ins and cuttingboard/tray drying rack with built-in Microban® antimicrobial protection
 - 02** – 5"-diameter heavy-duty, N.S.F.-approved polyurethane-tired swivel casters with brakes on two (2) casters
 - 03** – Rotating, non-marking neoprene bumpers with stainless steel hubs, mounted just above the casters.

- TT – CHEMICAL STORAGE SHELVING:** Intermetro Super Erecta Stainless Steel Shelving: sizes, widths and lengths as per plan; four (4) tiers high, each section with four (4) 74PS stainless steel posts.
- UU – MOBILE WORK TABLE:** Mobile Work Table, size and shape as indicated on plans; sides turned down 2" square with 1" radius corners; Type 304 s/s legs and gussets; 16-gauge stainless steel fully-welded undershelf where shown; 5" heavy-duty casters, all with brakes.
- VV – EXHAUST HOOD:** Gaylord Model PG-ND-BDL-MAW-60 exhaust hoods without exhaust damper, all-welded 18-gauge Type 304 stainless steel construction, as follows:
- 01** – Sizes and shapes per plan. K.E.C. to field-verify length and as-built wall dimensions and adjust length of hood as required for a fit of 1" tolerance.
 - 02** – Suspend from structure above, with bottom of hoods at 6'-6" a.f.f.; stainless steel closure panels to enclose space between hoods (where exposed) at end and bottom with 18-gauge Type 304 stainless steel panels
 - 03** – UL-listed stainless steel baffle-type filters
 - 04** – Stainless steel perforated front-discharge make-up air panels
 - 05** – Continuous drip-trough
 - 06** – Recessed fluorescent light fixtures and lamps
 - 07** – Fan/light switches furnished to Electrical Contractor for remote-mounting on wall.
- Alternate:** Ventmaster or Avtec models of equal specifications may be considered, if submitted to District's Kitchen Consultant for approval two weeks prior to bid opening.
- WW – MANUAL CAN OPENER:** Two (2) Nemco Model 565050-1 CanPRO compact model, mounted on tables as indicated on plan, plus one (1) additional Model 56029 cutter.
- XX – ELECTRIC CAN OPENER:** Edlund Model 270 electric can opener, set in place per plan.
- YY – INGREDIENT SCALE:** Tanita Model KD-200 Digital Scale with removable platform; cord and transformer plug. Units of measure shall be 70 oz. x 0.1 oz. (2000 g. x 2 g.)
- ZZ – UTILITY TABLE:** Open-base table, size and shape as indicated on plans; sides turned down 2" square with 1" radius corners and 8" high splash per plan; Type 304 stainless steel legs and gussets with adjustable bullet feet; 16-gauge stainless steel fully-welded undershelf.

11 51 00 – LIBRARY EQUIPMENT – Theft protection systems, depositories, automated shelving/retrieval, etc.

- A – SUBMITTAL REQUIREMENTS –**
- 01** – Submittals: Product data, shop drawings, samples, layout plan and details, manufacturers' instructions, schedule
 - 02** – Closeout: Submittals updated to Record status (samples excluded), O&M manual, on-site demonstration and training video for LPS staff, warranties
- B – BOOK THEFT PROTECTION EQUIPMENT** – Work in this section is restricted to specific manufacturers that have been previously approved by the Littleton Public Schools Purchasing Department: Checkpoint, 3M.
- 01** – Fully functional within an environment of electromagnetic interference from computers, monitors, copiers, ballasts and other sources.

- 02 – Electromagnetic or radio frequency type
 - 03 – Portable or fixed station
 - 04 – Suitable for protecting both printed and electronic media
 - 05 – Manufacturer qualifications:
 - a – Minimum five (5) consecutive year firm history of manufacturing institutional grade Library Equipment
 - b – Minimum five (5) installations of the specific product in public schools or comparable institutional occupancies in Colorado or adjacent states.
 - 06 – Maintenance Service:
 - a – Full-time service based or branched in Colorado or adjacent state.
 - b – 24-hour a day, 365 days per year telephone support
 - c – Repair and service training for **LPS Operation and Maintenance Department** personnel.
 - d – Optional renewable annual service contract for 72 hour response for factory authorized on-site repair and service.
- C – BOOK DROP (DEPOSITORY)** – Open to any product or material that is fully-assembled wood fabrication with chute and “slow down” feature.

11 53 00 – LABORATORY EQUIPMENT

A – SUBMITTALS –

- 01 – Submittals: Product data, shop drawings, samples, layout plan including utility connections, manufacturers’ instructions, schedule
- 02 – Closeout: Submittals updated to Record status (samples excluded), O&M manual, on-site demonstration and training video for LPS staff, warranties

B – COORDINATION – Verify type, size and routing of water, waste, gas, HVAC and electrical with those trades.

C – EQUIPMENT –

- 01 – Fume Hoods:
 - a – Pre-wired and pre-piped; factory-finished sides, base and filler panels. Drains, water supplies or cup sinks are prohibited.
 - b – Restricted to specific manufacturers that have been pre-approved by the **LPS Operations, Maintenance and Construction (OMC) Department:** Fisher-Hamilton, Air Master, Kewaunee, Taylor.
- 02 – Acid Storage Cabinet: 18 ga. coated steel, vented at rear
- 03 – Ammonium Hydroxide Storage Cabinet: Wood
- 04 – Ammonium Nitrate Storage Cabinet: Wood
- 05 – Flammable Organics Cabinet
 - a – Noncombustible construction compliant with NFPA Code 30 and OSHA
 - b – Explosion proof refrigerator permitted.
- 06 – Flammable Metals Cabinet:
 - a – Noncombustible construction compliant with NFPA Code 30 and OSHA
 - b – Explosion proof refrigerator permitted.

11 61 00 – THEATER & STAGE EQUIPMENT – Rigging systems, lighting, curtains, etc.**A – SUBMITTAL REQUIREMENTS –**

- 01** – Initial Submittals: Product data, shop drawings, samples (as appropriate), layout plan and details, manufacturers' instructions, schedule
- 02** – Closeout: Submittals updated to Record status (samples excluded), O&M manual, on-site demonstration and training video for LPS staff, warranties

B – RESTRICTIONS – Professional legitimate stage type flyloft apparatus is prohibited.**C – CHORAL/INSTRUMENTAL RISERS:** 3-tier assembly; rectangular sections only (triangular filler sections prohibited); non-skid surface, uncarpeted.**D – STAGE CURTAINS:** Velour, certified flameproof; pre-bagged; pre-hung; sized at 130% of proscenium width.**11 66 23 – GYMNASIUM EQUIPMENT** –**A – SUBMITTAL REQUIREMENTS –**

- 01** – Initial Submittals: Product data, shop drawings, samples (as appropriate), layout plan and details, manufacturers' instructions, schedule
- 02** – Closeout: Submittals updated to Record status (samples excluded), O&M manual, on-site demonstration and training video for LPS staff, warranties

B – EQUIPMENT – Typically provided by Owner; coordinate with the **LPS Operations, Maintenance and Construction (OMC) Department**.**C – CURTAIN DIVIDER(S)** shall be provided to divide cross courts for Physical Education (PE), with top portion to be open netting for air circulation.**D – LOCKERS** – Welded, ventilated, metal, double-tiered, prefinished in baked enamel..**E – FLOOR ANCHORS** – Provide inserts, clamps, mat straps, etc., for ropes, nets, etc., at location(s) determined by the **OMC Department**. Unless noted otherwise in Bid Documents, **LPS** will furnish equipment for installation by the Contractor(s).**11 68 00 – PLAYFIELD EQUIPMENT AND STRUCTURES** –**A – STANDARDS –**

- 01** – Playgrounds must conform to AASTM, CPSC and ADA requirements.
- 02** – In the absence of other information, standards of the following apply: United States Consumer Product Safety Commission (CPSC) Handbook for Public Playground Safety.
- 03** – IPEMA certification required for each individual component.

B – SUBMITTAL REQUIREMENTS –

- 01** – Initial Submittals: Product data, shop drawings, samples (as appropriate), layout plan and details, manufacturers' instructions, schedule
- 02** – Closeout: Submittals updated to Record status (samples excluded), O&M manual(s), on-site demonstration and training video for **LPS** staff, warranties

C – PLAY STRUCTURES –

- 01** – Powder-coated steel or aluminum structure, bolted or welded assembly, with heavy-duty plastic seats, panels, roofs or other accessories
- 02** – Posts shall be minimum 3.5” O.D. for pre-school and kindergarten children and 5” O.D. for children to 12 years old; posts to be set into the ground in concrete, minimum 3x post O.D.
- 03** – All play structures require transfer station(s) or ramp(s)
- 04** – Prohibited:
 - a** – Elevations higher than 9 feet 0 inches above finish grade
 - b** – Wood structures or elements
 - c** – Play panels with bubble windows
 - d** – Poly-rope components
 - e** – Truck, pulley or cable devices
 - f** – Whirl/merry-go-round
 - g** – Seesaw
 - h** – Galvanized slides
- 05** – Safety surfacing required:
 - a** – Surfacing must conform to ASTM, CPSC and ADA requirements.
 - b** – Engineered wood fiber or 2-ft. square rubber tile surfacing. No poured-in-place rubber surfacing permitted.
 - c** – Playground surfacing installation must be overseen by a Certified Playground Safety Inspector with current training and certification from the National Playground Safety Institute.

D – PLAYGROUND EQUIPMENT –

- 01** – Soccer, Field Hockey, Lacrosse Goal:
 - a** – Removable steel frame, minimum ___-in. tube wall and ___-in. O.D., with safety-type covers for sleeves
 - b** – Set sleeves in concrete 1 inch (minimum) below finish grade.
- 02** – Basketball or Pickleball Goal:
 - a** – 4-foot cantilever-type post, minimum ___-in. tube wall and ___-in. O.D., set in concreted sleeves to a minimum depth of 4ft below finish grade
 - b** – White powder-coated steel backstop with official orange target and perimeter marking
 - c** – Fixed-height goal with nylon net; breakaway style goal prohibited
- 03** – Tennis Court System:
 - a** – Posts shall be removable, concrete-sleeved, powder-coated square tube.
 - b** – Stainless steel hardware with removable crank and internal brass gears

E – BASEBALL FIELDS –

- 01** – Fencing:
 - a** – All posts and rails LG40 wall thickness
 - b** – Line-posts 2.375” O.D.; corner posts 3” O.D.; rails 1.625” O.D.
 - c** – 4” O.D. posts at gates 6’-0” wide or bigger; 3” O.D. posts at smaller gates
 - d** – Standard 9 ga. steel fabric, knuckle to knuckle
- 02** – Backstop: Include backstop kick plate made of Trex.
- 03** – Provided by Owner; coordinate selection, design, mounting and utility connections with the **LPS Operations, Maintenance and Construction (OMC) Department**.

★ END OF DIVISION 11 ★

DIVISION 12 – FURNISHINGS**12 21 00 – WINDOW BLINDS –****A – APPLICATIONS –**

- 01** – Blinds are required at all exterior windows.
 - a** – Instructional areas (alternative: shades; see Section 12 24 00)
 - b** – Administration areas
- 02** – Window blinds are permitted at interior glazing.
- 03** – Maintain minimum separation distance between window blinds and glazing in strict compliance with glazing manufacturer recommendations.

B – SUBMITTALS –

- 01** – Submittals: Product data, shop drawings, samples, layout plan and details, schedule
- 02** – Closeout: Submittals updated to Record status (samples excluded), O&M manual, warranties

C – CONFIGURATION – Horizontal blinds preferred; vertical blinds prohibited.

- 01 – OPERATION –** Manual only, unless otherwise approved by the **LPS Operations, Maintenance and Construction (OMC) Department**
 - a** – Tilt Wand: Field-replaceable 5/16-inch hexagonal-profile transparent acrylic plastic
 - b** – Cord Lock: Crash-proof mechanism; 0.042 inch corrosion-resistant steel
 - c** – Ladder-braid: UV-stabilized polyester yarn with reinforced core; 23” maximum spacing
 - d** – All blinds within reach of children below 2nd Grade shall have auto-raise function with no pull-cords.
- 02 – FRAME AND MOUNTING:**
 - a** – Headrail: U-profile 0.25-inch corrosion-resistant steel with concealed hardware
 - b** – Bottom rail: 0.031 inch corrosion-resistant steel
 - c** – Mounting Brackets: 0.048 inch corrosion-resistant steel with rivet-hinge safety lock front cover to permit removal of headrail without lateral movement
 - d** – Tilter: 0.042 inch corrosion-resistant steel housing with a self-lubricating and automatically disengaging nylon worm-gear mechanism to eliminate overdrive; gear ratio 1:4 or 1:1
 - e** – Cradle: 0.042 inch corrosion-resistant steel
 - f** – Drum: Die-cast steel or engineered polymer
- 03 – SLATS:**
 - a** – 0.072 inch minimum thickness copper-free 5000-series magnesium aluminum alloy
 - b** – Reprocessed metal, vinyl or plastic slats are prohibited.
- 04 – FINISH:** Painted; alkyd resin with no lead content

12 24 00 – WINDOW SHADES –

A – APPLICATIONS – Coordinate with the **LPS Operations, Maintenance and Construction (OMC) Department.**

B – SUBMITTALS –

- 01 - Submittals: Product data, shop drawings, samples, layout plan and details, schedule
- 02 - Closeout: Submittals updated to Record status (samples excluded), O&M manual, warranties

C – CONFIGURATION –

- 01 - Manually-operated standard; motorized where mechanism is over 10'-0" above finish floor
- 02 - PVC-coated polyester material
- 03 - Openness factor: South-facing 5%, other locations 14%

D – WARRANTY – 25-year manufacturer hardware, chain and shade cloth.

E – ACCEPTABLE MANUFACTURERS –

- 01 - Springs Window Fashions (LPS-preferred, via J&D Window Innovations, LLC)
- 02 - MechoShade Systems, Inc.
- 03 - Levelor Contract Division
- 04 - Hunter Douglas Window Fashions
- 05 - Draper Shade & Screen Co.

12 36 00 – SPECIALTY COUNTERTOPS – Science labs and classrooms, tech/arts classrooms.**A – SUBMITTAL REQUIREMENTS –**

- 01 - Submittals: Product data, shop drawings, samples, layout plan and details, schedule
- 02 - Closeout: Submittals updated to Record status (samples excluded), O&M manual, warranties

B – SCIENCE CLASSROOMS – Solid monolithic material; epoxy resin with the following characteristics:

- 01 - Non-porous
- 02 - Resistant to all instructional laboratory chemicals, including acetone and acetic acid
- 03 - Flame resistant
- 04 - Abrasion resistant
- 05 - Color: Black
- 06 - Twenty-five year service life without degradation of appearance

C – TECH/ARTS CLASSROOMS – Wood, metal or epoxy resin; resistant to cuts, gouging and staining**D – OTHER COUNTERTOPS WITH SINKS OR LAVATORIES –** Solid material (e.g., Corian or equal) as approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

12 48 43 – ENTRANCE FLOOR MATS – Entry mats shall be nylon carpet scraper mats with finished edges. No recessed, framed or metal-tread or-slatted entrance mats shall be used.

12 59 16 – FREE-STANDING COMPONENT SYSTEM FURNITURE – Standard for office cubicles, partitions, desks, etc., shall be Herman Miller or approved equal. Coordinate with the **LPS Operations, Maintenance and Construction (OMC) Department**.

12 60 00 – MULTIPLE AUDIENCE SEATING –

A – SUBMITTAL REQUIREMENTS –

- 01** – Submittals: Product data, shop drawings, samples (preferred), layout plan and details, schedule
- 02** – Closeout: Submittals updated to Record status (samples excluded), O&M manual, warranties

B – FIXED AUDIENCE SEATING – Floor mounted; upholstered in theaters and auditoriums unless directed otherwise by the **OMC Department**

- 01** – Standards: Heavy-gauge rectangular profile tubular steel welded to mounting plate, seat, back and armrest
- 02** – Seat: One-piece construction, mechanically restrained from separating from standards
- 03** – Hinge: Compensating-type heavy-duty cast iron or steel; noiseless self-rising mechanism
- 04** – Arm rest (if directed by the **OMC Department**): Steel, aluminum, solid wood or solid molded plastic; veneer or laminated construction prohibited
- 05** – Aisle lights built into seating end-panels: UL-listed with rectangular louvered metal faceplate; LED Technology preferred

C – STADIUM AND ARENA SEATING – Wood (interior, only), molded plastic or aluminum bench seating on bolted-down metal brackets, as directed by the **OMC Department**

D – TELESCOPING STANDS – Floor mounted; upholstered in theaters and auditoriums unless directed otherwise by the **OMC Department**

01 – DESIGN CRITERIA –

- a** – Comply with applicable sections of the International Building Code and ICC/ANSI 117.1 as required by Division of Fire Safety, Colorado Department of Regulatory Agencies.
- b** – Design loads: Vertical live load 100 PSF, but not less than 120 PLF at seat and footboards. Sway force horizontal 24 PLF, 10 PLF perpendicular to the seat.
- c** – Cold-formed steel complying with ASTM A570 Grade C; ASTM A653-Grade 33, 50; ASTM A500 Grade B46.

02 – CONSTRUCTION –

- a** – Seats:
 - 18 inch wide one-piece, ribbed, individual seating modules constructed of high density polyethylene
 - Each seat module to have longitudinal and transverse internal ribbing
 - Steel to steel attachment of each seating module to the nose-beam
 - Interlock each seating module to the adjacent module at the perimeter and internal ribs to assure proper alignment.
- b** – Decking: Minimum 19/32" Douglas Fir CC Grade with exterior glue and solid cross-bands. Aluminum "H" connector between deck panels. Wear surfaces

- finished in high-density polyethylene. Clear coat not permitted.
- c - Frame assembly :
 - Steel truss design
 - Continuous steel wheel channel to accommodate 8 -12 wheels per row
 - Size wheels appropriately with non-marring face to protect finished floor.
 - d - Configuration :
 - Wall mounted vertical flush-front stack. Reverse folding configuration is permitted for special applications only.
 - Row spacing: 25 inches minimum
 - Installations:
 - 6 rows or higher: Row-rise of 10" or 12" is acceptable. Typical of Main Gyms.
 - 5 rows or lower: Row-rise of 10" only. Typical of Auxiliary Gyms.
 - Provide additional bracing to prevent deflection in closed position.
 - Capacity: Assume 18 lineal inches per occupant.
 - In closed position, horizontal gaps between sections may not exceed ½".
 - Comply with applicable codes and regulations for aisles, railings.
- 03 - OPERATION -** Motorized systems are required for installations of 10 rows or more when unit Length (in feet) x number of Rows exceeds 250.
- a - Propulsion:
 - Coordinate power supply with available voltage.
 - Power system to lock unit in any position
 - Limit-switch to regulate extended and closed positions
 - Motor starter, limit-switches and key control switch by manufacturer
 - b - Accessories:
 - Self-storing 42" high end rails
 - Wheelchair seating: 36" notch outs at section joints only. Fascia-board finish to match deck-board.
 - Pendant control style operation for extension and retraction. Single receptacle in first row of each section.
 - Vinyl end curtains to close-off exposed units in extended position.
 - Flush-mounted board closure between last row and wall.
 - Signage to indicate no sitting or standing on bleachers in closed position.
- 04 - FIELD QUALITY CONTROL -**
- a - Confirm lateral load capacity of wall structure.
 - b - Provide on-site operation/maintenance instruction for LPS personnel by manufacturer's authorized representatives.
- E - EXTERIOR SEATING -** Fixed aluminum tiered bleachers with concrete-set anchors and skid-resistant surfaces; safety rails and handrails as required by Code and local authority.

★ END OF DIVISION 12 ★

DIVISION 13 – SPECIAL CONSTRUCTION

13 11 00 – SWIMMING POOLS – No new swimming pool construction is contemplated at LPS Facilities. Potential work includes repairs and resurfacing of existing concrete pools, gutter system renovation, and replacement of ancillary furnishings and equipment.

- A – STANDARDS** – All systems shall be designed and constructed to meet all national and local codes and to comply with applicable sections of ANSI/NSPI-2 1999 and rules and regulations of the NCAA, USA Swimming, National Federation of State High School Associations and Colorado High School Activities Association (CHSAA).
- B – SUBMITTAL REQUIREMENTS** –
- 01** – Submittals: Product data, shop drawings, samples, plans and schedule
 - 02** – Closeout: Submittals updated to Record status (samples excluded), O&M manual, warranties
- C – FINISHED SURFACES** –
- 01** – Internal pool surfaces shall be a Diamond Brite or Pebble Tec finish with slip resistant surface and vertical tile band.
 - 02** – Pool markings and trim shall be 2" x 2" black unglazed tile (American Olean or approved equal), as follows:
 - a** – Lane lines and targets shall be 12 inches wide.
 - b** – Break lines at transition into deep end shall be 4 inches wide.
 - c** – Match existing at perimeter tile deck band, end wall parapet, gutter nosing, depth markings and warning signs and all other tile installations.
 - 03** – Tolerances for overall dimensions within the pool shall be maintained in strict compliance with CHSSA requirements for competitive swimming pools.
- D – CONSTRUCTION** –
- 01** – Sawcut and chip old plaster/concrete and caulking under gutters and around any penetration (min. 2") leading into the pool. Replace broken return fittings.
 - 02** – Remove any existing paint of the concrete with sandblasting or similar method to remove 100% of the old paint, protecting gutters, return inlets and main drain from collecting any debris.
 - 03** – Remove recessed steps and install new white ones to match the new plaster.
 - 04** – Install water plug or hydraulic cement around any penetration and under gutters to seal the shell where concrete wash chipped out, leaving 1/2" to feather–in the new plaster.
 - 05** – Wash down surfaces with an acid solution, and neutralize with pressure washing (at least 3,500 psi).
 - 06** – Apply SGM Bond Kote (or approved equal) for adhesion of new plaster to old.
 - 07** – Apply new exposed aggregate (CLI Sunstone or SGM Diamond Brite Blue Quartz) at 3/8" to 1/2" thick, tapered into old penetrations for smooth transitions.
 - 08** – Expose new plaster using a light acid wash to bring out the blue aggregate in the plaster and limit plaster dust.
 - 09** – Coat interior surfaces of gutter trough with a white or other Owner-approved light-colored high-build epoxy or other waterproofing material: Xypex, Vandex, Planiseal 88, Thoroseal, Aquafin 2KM or other pre-approved equal.

E – EQUIPMENT –

- 01 – Single Post Starting Platforms** shall be custom blocks similar to Legacy Starting Platform with rear step and backstroke bar by SR Smith, Keifer Competitor, Paragon Track Start Quickset or equal pre-approved by the Owner. Blocks shall include SR Smith Rock Solid Anchor System 27-107 (or equal from other acceptable manufacturer). Frames shall be 2.5" square x 0.120" wall thickness 304 stainless steel tubing with powder-coat finish in color selected by Owner. Rear access step shall be 8" x 12". Backstroke bar shall allow both horizontal and vertical grab positions. Platform top shall be 24" x 32" constructed of acrylic outer body skin and slip resistant sanded tread over solid laminated board covered with fiberglass and resin roving. Platform block height shall not exceed 29-1/2" above water level; verify height of platform above water before ordering. Platforms shall have number plates on both sides, numbered as directed by Owner. Each starting platform shall also have two labels affixed stating "Warning: Execute Shallow Racing Dive - Impact with Pool Bottom can Cause Permanent Injury."
- 02 – Diving Stands** for one-meter and three-meter springboards shall be Durafirm by Duraflex International Corp., installed as shown on the plans. Stands shall consist of heavy aluminum castings dipped in Iridite chromic acid solution, followed by a 20 mil coat of baked epoxy, with field touch-up if damaged in shipping or assembly. Roller tube and tracks shall be heat-treated extruded aluminum processed by Alcoa Duranodic hard-anodizing process. Bearings for roller tube and slide shall be nylon with grease fittings, adjustable and field replaceable. Diving board anchor hinges and pins shall be heat-treated aluminum forgings with a design tensile strength of 35,000 psi and shall receive Alcoa Duranodic hard-anodizing. Hinges shall be designed to allow 180-deg. rotation of the diving board to the rear of the stand and shall be mounted on a transverse casting machined to allow 7 leveling positions in one-inch increments. Diving board anchor bolts shall be 5/8-inch diameter by 3-1/2 inch long silicon bronze. Diving stands shall be supplied with top and intermediate guard rails on two sides, using stainless steel tubing firmly attached to guard rail supports with stainless steel band fasteners. Rails shall extend to the edge of the swimming pool, and the rail ends shall be fitted with rubber safety tips. Fulcrum shall have an adjusting wheel at one end that can be turned by hand or foot.
- a – One Meter:** Durafirm Catalog #70-231-400, with
(8) Bronze Deck Anchors Durafirm Catalog #70-231-900
- b – Three Meter:** Durafirm Catalog #70-231-300, with
(8) Bronze Deck Anchors Durafirm Catalog #70-231-900
- 03 – Diving Boards** shall be aluminum extrusion type springboards, Maxi-Flex Model "B" by Duraflex International, Inc., Model #66-231-330, or approved equal. Boards shall be 16 ft long and 19-5/8 inches wide. Top surfaces shall be finished with three coats combined with a mixture of sand and white aluminum oxide to effect the non-skid surface with 200 perforations.
- 04 – Lifeguard Chairs** shall be movable and provided with a molded plastic seat at 6 feet above the deck. Seats shall be capable of 360-degree swivel and shall be supported on a stainless steel tube structure. Platform shall be laminated wood coated with fiberglass and polyester resin in a non-skid surface. Access to the platform shall be by means of a sloping front ladder 26" wide. Ladder steps shall be injection molded ABS, UV stabilized, 26" long x 5" wide with raised non-skid tread. Framework of the chair shall be rigidly bolted. Ladder and guard

rails shall be manufactured of stainless steel tube, 1.90" OD x 0.065" wall thickness, Type 316L polished and buffed to a 320-grit finish. Wheels of 7" diameter shall be attached to the bottom of the front leg, and means of attaching a rescue tube shall be provided. Chairs shall be Paragon Aquatics Catalog No. 20302, or approved equal.

- 05 – Pool Lift** shall be a portable, battery-powered handicap lift with footrest assembly: PAL Lift or pre-approved equal. Lift shall be capable of lifting 300 lbs. and shall include the following: arm rest assembly, seat belt assembly, lift cover, stability vest, extra battery and spineboard attachment. Contractor shall confirm that pool lift fits on pool perimeter and operates correctly.
- 06 – Sockets and Anchors** for accessories and deck equipment shall be stainless steel or cast bronze. Contractor shall confirm compatibility of deck equipment and anchors with equipment manufacturer(s). All anchors or sockets shall be furnished with flush closure caps and escutcheons with set screws as indicated.

- F – WARRANTY** – Provide minimum one-year warranty on workmanship and standard manufacturers' warranties on the new plaster and on all deck equipment.

13 34 13 – GREENHOUSES –

A – APPLICATIONS – Coordinate with the **LPS Operations, Maintenance and Construction (OMC) Department.**

- 01** – Structures in excess of 120 square feet must secure a building permit through the Department of Public Safety.
- 02** – Occupancy group as defined by the International Building Code is Group U.
- 03** – Greenhouses shall not be available to the general public.

B – STANDARDS –

- 01** – Greenhouses shall be designed to current code for roof and snow loads. Calculations by a Colorado Professional Engineer shall be provided.
- 02** – Greenhouse installer shall meet requirements for an MS4 stormwater permit.
- 03** – Subcontractor shall have 5 years' minimum experience in the manufacture and installation of greenhouses.

C – SUBMITTAL REQUIREMENTS –

- 01** – Submittals: Product data, shop drawings, samples (preferred), plans and schedule. Dimensioned drawings shall include site plan, floor plan, elevations and wall section showing construction method and materials.
- 02** – Closeout: Submittals updated to Record status (samples excluded), O&M manual, warranties

D – CONSTRUCTION –

- 01** – Greenhouse shall have concrete foundations and floor slab.
- 02** – Plumbing Systems shall comply with these Guideline Specifications and applicable plumbing codes.
 - a** – Minimum plumbing installation consists of a three cubic foot sediment container with accessible grate.
 - b** – Specialty plumbing systems consisting of misters or hydroponics shall be provided by the greenhouse manufacturer.

- c - Hydroponic systems (optional) shall connect to a sanitary sewer system; if a sewer system is not available, a drainage field consisting of buried perforated pipe shall be provided.
- 03 - Ventilation and Heating optional. If provided, systems shall meet requirements of these Guideline Specifications and mechanical codes. Mechanical ventilation and/or heating shall be provided by the greenhouse manufacturer.
- 04 - Electrical Power and Lighting are optional. If provided, installations shall meet the requirements of these Guideline Specifications and electrical codes. Any specialty electrical shall be provided by the greenhouse manufacturer.

The following technology systems, previously included under CSI Division 13, are further summarized in these Guideline Specifications under Division 26 and detailed fully in LPS Technology Standards Divisions 27 and 28 (revised May 2016).

COMMUNICATIONS SYSTEMS –

A – EXISTING SYSTEMS INSTALLED PRIOR TO 2013 are maintained and repaired as needed by the **LPS Operations, Maintenance and Construction Department** (Clock and Bell Programs) or **ITS Department** (Intercoms). Existing Clock and Bell Program systems typically consist of Simplex master clocks and slaves for time-keeping and class-change bells

B – NEW COMMUNICATIONS SYSTEMS INSTALLED AFTER 2013 shall be Valcom Engineered Solutions (Class Connections) systems designed, engineered and installed in full compliance with applicable sections of LPS Technology Standards Divisions 27 and 28.

SECURITY SYSTEMS – For all new Building and Addition construction projects, design and engineer security system(s) acceptable to and approved by the **LPS Security and Emergency Planning Director** and the **LPS ITS Department** before Construction Documents are finalized for bidding.

A – CAMERAS, MOTION DETECTORS and OTHER SECURITY DEVICES shall be installed where designated by the **LPS Security and Emergency Planning Director**, with routing of conduit and cabling runs approved by the **LPS ITS and Operations, Maintenance and Construction (OMC) Departments**.

TECHNOLOGY INFRASTRUCTURE –Technology Infrastructure includes: intranet and internal cabling and pathways; racks, servers and UPS equipment in telecommunications rooms; and panels, relays and programming typically serving interactive IP-based data, wireless access, voice, intercom, clock/bell program, public address, video, and access control and other life-safety systems.

★ END OF DIVISION 13 ★

DIVISION 14 – CONVEYING SYSTEMS

Where passenger elevators and/or chairlifts are required, systems shall comply in full with all applicable building codes, regulations, Americans with Disabilities Act Guidelines, laws and ordinances, including both the technical provisions and the administrative guidelines of the State of Colorado.

Emergency (battery) backup power shall be provided, and all elevators shall be key-access only.

Elevator cars or enclosed platform chairlifts shall include audible emergency alarms and remote alarm signals to building administration office, in lieu of car telephones.

14 20 00 – ELEVATORS – Traction, hydraulic, etc., shall comply with all applicable Codes and current edition of ANSI A17.1.

14 42 00 – WHEELCHAIR LISTS – Inclined, vertical, etc., shall comply with all applicable Codes and current edition of ANSI A18.1.

★ END OF DIVISION 14 ★

DIVISIONS 20-23 – MECHANICAL AND PLUMBING**20 05 00 – BASIC MECHANICAL REQUIREMENTS**

- A – PERFORMANCE** – Work shall be provided in accord with Underwriters Laboratories, local Public Utilities, Cities of Littleton and Centennial, Arapahoe and Jefferson Counties, and State of Colorado codes, ordinances, and regulations and **LPS** special requirements. Licensed craftsmen shall be on-site at all times while work of their trade is being performed, with licenses in their possession to be presented upon request as required by regulations.
- B – CONSTRUCTION COST(S)** shall include natural gas hookup and installation fees, water meter, water and sewer tap fees (excluding development fees) and associated piping and fittings.
- C – OPERATIONAL CERTIFICATION(S)** – Upon completion of project work, all necessary adjustments shall be made to test and balance Heating and Cooling air and hydronic systems. A complete written report of systems operations shall be furnished to the **LPS Operations, Maintenance and Construction (OMC) Department** with data sheets indicating amount of air handled, room temperatures, exterior weather data, equipment data, and other pertinent data. The same procedure will be repeated during the first winter and first summer after occupancy at no additional cost to **LPS**. **LPS** reserves the right to confirm HVAC testing and balancing by a separate contractor working directly for **LPS**.
- D – MAINTENANCE AND OPERATION MANUALS** – Three printed copies of Operation and Maintenance manuals shall be furnished to **LPS** on completion of and prior to **LPS** acceptance and payment for installation. **OMC Department** representatives shall be instructed on proper operation and maintenance of all systems-using the manuals as a guide. Furnish detailed written instructions for Custodial and Maintenance personnel spelling out daily, weekly, monthly and yearly requirements. Deficiencies in mechanical installations and equipment will be corrected during the first year of operation (or as designated by extended warranty or legal obligation) at no additional cost to **LPS**.
- E – ALTERNATING/STAND-BY PUMPS** shall be provided in main Heating Circulating systems. Pumps should: be sized slightly above performance curve; be properly supported; not be close-coupled; have bronze impellers for domestic side, iron impellers for heating side; include valved by-pass as feasible; include isolation valves at gauges; include back-up or stand-by for main or boiler pumps; have temperature/pressure gauge(s) at main circulation pumps; be easily accessible for operation, maintenance and replacement and not be installed overhead.
- F – EVAPORATIVE COOLING** will be considered only in limited situations and after consultation with and approval by the **OMC Department**.
- G – ENVIRONMENTAL** air conditioning requirements shall accommodate computer installations as specified under Divisions 27 and 28.
- H – EQUIPMENT, MOTORS, AND CONTROLS** associated with addition and remodel areas will be the same manufacturer(s) as existing and/or shall comply with the **LPS** list of acceptable products (see Appendix, this Section.) Motors should: be energy-efficient; have sealed bearings; not be split-phase; be variable-speed if 10 hp or larger, except as approved by the **OMC Department**. Thermostats/controls should be accessible and have copper lines in exposed areas and where temperature is a factor.

- I – **AUTOMATION SENSORS** will be provided on designated equipment by the Mechanical Contractor, coordinated with the **OMC Department**.
- J – **A/E RESPONSIBILITIES** include defining Contractor-responsibilities relative to existing **LPS** automation connection points. The **A/E** is responsible for coordinating instructions with the **OMC Department** before specifications are completed and ready for bid and construction.
- K – **SECURITY AND FIRE ALARM SYSTEMS** are to be coordinated between Drawings and Specifications prior to receipt of bids.
- L – **TEMPERATURE CONTROL SYSTEMS AND EQUIPMENT** must match existing **LPS** Direct Digital Control (DDC) systems and equipment by Johnson Controls.
 - 01 – New equipment shall include factory-installed DDC modules, field-connected to Metasys NCU provided by Johnson Controls.
 - 02 – Control of existing equipment shall be maintained via existing Johnson Control devices, field-modified as required.
 - 03 – Field level controls are to be BACnet MSTP compatible and interface with the existing JCI ACX Platform.
- M – **ELECTRICAL TEMPERATURE CONTROL SYSTEMS** shall be installed in accordance with Section 23 09 23 and Division 26.
- N – **BOILER AND GAS LINE WORK** –
 - 01 – **CONTRACTOR(S)** will not do any work on gas lines on or near building(s) while building is occupied.
 - 02 – **NO WORK** on boilers, furnaces, or gas lines will be permitted without prior notification and approval of, and coordination with, the **OMC Department**.
 - 03 – **BOILERS AND FURNACES** will not be turned on or off by Contractor(s). When boilers or furnaces are to be turned on or off, the **OMC Department** will be notified, and appropriate personnel will be dispatched to carry out necessary procedures.
 - 04 – **BOILERS** shall: be energy-efficient; be dual-burner types (natural gas) at high schools; be forced-draft wherever possible; include an automatic make-up water system with in-line flowmeter, odometer/dial readout and pulse output option for both local and remote indication.
- O – **VALVES AND VALVED SYSTEMS** should: have the ability to isolate zones (supply and return); be accessible; contain a midway isolation valve where feasible; have isolation valves installed on each side of individual equipment, especially circulation pumps; have main valves color-coded; have manual air-bleeds piped to ground/floor level and automatic bleeds valved; have no iron plug valves; have **no dielectric unions** (brass only); have dielectric nipples.
- P – **STEAM PIPING** –
 - 01 – All steam **supply piping** shall be Schedule 40.
 - 02 – All steam **return piping** shall be Schedule 80.

21 10 00 – FIRE SUPPRESSION

- A – **SPRINKLER SYSTEM** supply lines shall be installed overhead, not underground, for easy inspection and drainage.
- B – **NORMAL REQUIREMENT** is two hydrants within 500' of maximum risk; one within 700' of furthest risk. Basement areas, corridors/exits, Auditorium platforms, Boiler Rooms, and Kitchen areas shall be investigated to determine fire protection requirements within the Building(s), as required by the latest edition of applicable Building Code(s).
- C – **FIRE ALARM SYSTEMS/EXTENSIONS** shall be provided to match existing system(s) or as otherwise approved by the **LPS Operations, Maintenance and Construction (OMC) Department** and governing fire department

22 05 00 – PLUMBING – Comply with local and state codes governing plumbing. Provide adequate facilities for cleaning of sewer and waste lines. Provide stub-out of utilities for temporary facilities required by LPS design programs. Consider future addition(s) when sizing utilities. Refer to Section 11 40 00 Food Service Equipment for Kitchen requirements.

- A – **FIXTURES** – Vitreous china, low-flow type except at water closets (minimum 1.6 gpm).
 - 01 – **UTILITY COUNTERTOP SINKS** may be stainless steel.
- B – **BRASS** – Plated type; chrome preferred.
- C – **PIPING** –Copper service and supply (Type L only, unless pre-approved by the **LPS Operations, Maintenance and Construction (OMC) Department**); iron waste and vent preferred. Soldered and Victaulic (groove-lock) installation, only, for copper pipe and fittings. Any other than these approved methods must be reviewed and approved for each specific case by the **OMC Department** prior to Construction Documents.
- D – **LEAD** – No lead materials shall be used in potable domestic water systems at LPS.

23 05 00 – HEATING, VENTILATING, AIR CONDITIONING (HVAC) – Systems shall have night-time free-cooling capabilities. Systems shall be sound isolated to a maximum 45dB background noise level within occupied space(s), in accordance with CDE standards and ANSI S12.60.2010. Temperatures in occupied spaces shall adhere to **LPS Board of Education** policy (details below).

- A – **MECHANICAL COOLING** on LPS-designated projects shall be selected as most appropriate and cost-effective for specific building conditions. Where central plant chillers do not exist or connection is not practical, as determined by the **LPS Operations, Maintenance and Construction (OMC) Department**, preference shall be given to (1) DX cooling or (2) roof-top package units, especially where no mixed-air ducted distribution exists or is feasible. Heat pumps or active chilled beam systems may be considered, with approval by the **OMC Department**. All equipment must meet Colorado Regulation 15.
- B – **HEATING AND COOLING SYSTEMS** shall furnish positive ventilation and comply with current ASHRAE standards. Projects with or without mechanical cooling shall have provision for introducing up to 100 percent outside air when heating is not required.
- C – **HIGH VELOCITY AIR SYSTEM(S)** shall not be provided without mechanical cooling.
- D – **HEAT SOURCE** shall be central steam, hot water, or gas-fired unit(s) as approved by the **OMC Department**.

- E – DIRECT FIRED HEAT EXCHANGERS** are not allowed.
- F – BASIC HEATING AND VENTILATING EQUIPMENT** may be rooftop, ground-set (least preferred) or central station type. No new Unit Ventilators will be installed at LPS.
- G – SUPPLEMENTAL HEATING** may be Unit Heaters, Cabinet heaters, Radiation, etc., as acceptable to the **OMC Department**.
- H – ELECTRIC HEAT** will be permitted only with **LPS** special approval.
- I – OCCUPIED SPACES WITHIN BUILDINGS** shall be maintained between 76 and 79 degrees Fahrenheit during cooling season and between 67 and 71 degrees during heating season. Interior temperatures during unoccupied periods shall be no lower than 55 degrees.
- J – EXHAUST** – Provide through relief opening(s) or fan(s). Wherever space(s) require exhaust air only, provide make-up air from areas of the building, as permitted by applicable Code.
- K – SUPPLY, RETURN, EXHAUST AIR SYSTEMS** – Variable volume, variable temperature supply air distribution is preferred. Design and balance systems so that the building will have slight positive pressure at all times. Air Ventilation Rates must meet current ASHRAE standards and locally applicable building codes.
- L – VENTILATION REQUIREMENTS** – Conform to latest edition(s) of the IBC, locally applicable Building Codes and Colorado Energy Conservation Code. Requirements contained therein will be considered as minimum.
- M – INDEPENDENT HVAC** systems provided for Administration areas (and other areas as designated by **LPS**) shall be separate from primary building HVAC systems, with central controls override afforded via on-site timer switch(es).

23 90 00 – ENERGY MANAGEMENT AND CONSERVATION SYSTEMS – Energy Conservation Standards of Colorado, latest edition, will be followed in the design of Heating and Cooling Systems with cross-reference to Electrical Energy utilized. Life Cycle Costing (**LCC**) for base systems (air, water, electrical, gas) and any proposed alternates shall be researched and reported in writing to the **LPS Operations, Maintenance and Construction (OMC) Department** when Design Development documents are submitted for review and approval.

APPENDIX – MECHANICAL DIVISIONS

Specifications for Mechanical Work shall incorporate the following **LPS** standard list of acceptable manufacturers and products, as applicable, with equals as pre-approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

21 10 00 – FIRE SUPPRESSION

- A. Valves: Nibco, Kennedy, Mueller, Stockham, Grinnell, Milwaukee, Central, Mission, Automatic, Firematic.
- B. Fire Department connections: Croker, Potter-Roemer, Standard, Elkhart.
- C. Dry pipe valves: Reliable, Viking, Grinnell.
- D. Air maintenance devices: Reliable, Viking, Grinnell, General Air.

21 12 00 – STANDPIPE AND FIRE HOSE SYSTEMS

Croker, Elkhart, Larsen, Potter-Roemer, Standard.

21 13 00 – FIRE SPRINKLER SYSTEMS

Gem, Central, Automatic, Reliable, Viking, Grinnell.

21 30 00 – FIRE PUMPS

Allis-Chalmers, Aurora, Fairbanks Morse, Patterson, Peerless.

22 05 00 – PLUMBING

- A. Cleanouts; shock arrestors; floor, roof and area drains; wall and yard hydrants: Josam, J.R. Smith, Woodford, Zurn.
- B. Trench drains: Polycast, Quazite.
- C. Hose bibbs: Josam, Woodford, Zurn.
- D. Domestic water heaters: A.O. Smith, Rheem, Ruud, State.
- E. Hot water generators: Bell & Gossett, Taco.
- F. Hot water storage tanks: American Steel & Iron Works, Eaton Metal Products, Engineered Sales & Service, Inc.
- G. Sewage ejectors and sump pumps: Swaby Liberty, Gorman Rupp.
- H. Pressure and temperature relief valves: Watts.
- I. Water pressure regulating valves: Bell & Gossett, Watts, Wilkins.
- J. Backflow preventers: Febco, Watts.

- K. Water tempering valves: Lawler, Powers, Watts.
- L. Precast concrete basins: Copeland.

22 11 23 – PUMPS

- A. Base-mounted, double suction pumps: Grundfoss, Bell & Gossett, Taco, Armstrong.
- B. Base-mounted, ball-bearing pumps, flexible-coupled: Bell & Gossett.
- C. Vertical turbine pumps: Allis-Chalmers, Goulds.
- D. In-line pumps: Bell & Gossett, Taco.
- E. Condensate return units: ITT Domestic, Skidmore.

22 12 00 – TANKS

- A. Expansion tanks: Bell & Gossett, Eaton Metal Products, Taco.
- B. Pressurized expansion tanks: Bell & Gossett, Amtrol, Wessel.
- C. Domestic hot water storage tanks: Eaton Metal Products, Patterson-Kelley, Ruud.

22 31 00 – WATER TREATMENT

Rocky Mountain Aqua Tech.

22 42 00 – PLUMBING FIXTURES AND TRIM

- A. Water closets, urinals, lavatories, bathtubs: American Standard, Kohler, Sloan, Zurn.
- B. Showers:
 - 1. Stall (stainless steel, only): Aquarius, Eljer, Gerber, Kohler, Lasco.
 - 2. Column shower: Bradley, Acorn.
 - 3. Base: Arco, Fiat, Stern-Williams.
- C. Sinks:
 - 1. Stainless steel: Elkay, Zurn.
 - 2. Vitreous china: American Standard, Kohler.
 - 3. Enameled cast iron: American Standard, Kohler.
- D. Mop service basins: Arco, Fiat, Stern-Williams.
- E. Electric water coolers, drinking fountains: Cordley, Elkay, Halsey-Taylor, Haws, Oasis.
- F. Wash fountains: Bradley.
- G. Emergency eye-wash, shower: Guardian Equipment, Haws, Speakman, Bradley.

- H. Toilet seats: Bemis, Church, Olsonite.
- I. Flush valves: Sloan (Royal), Zurn.
- J. Lavatory and sink supply faucets: American Standard, Chicago Faucet, Delta Workforce, Kohler, Moen Sani-Stream, Zurn.
- K. Metering faucets: No metering faucets are to be used in **LPS** buildings.
- L. Shower valves, heads: American Standard, Bradley, Chicago, Powers.
- M. Water tempering valves: Bradley, Powers, Watts, Leonard.
- N. Supply and drain fittings: American Standard, Brassco, Chicago, Kohler.
- O. Food waste disposals: In-Sink-Erator, National, Waste King.
- P. Fixture carriers: Josam, J.R. Smith, Wade, Zurn.

22 60 00 – SPECIAL PIPING SYSTEMS

Vacuum pumps: ITT Pneumotive, Lammert, Quincy.

23 05 13 – MOTORS, STARTERS & DRIVES

- A. Starters: Siemens/ITE, Sprecher+Schuh.
- B. Variable-frequency drives: ABB, Square D, Eaton, Aquavar, Yaskawa.

23 05 16 – EXPANSION COMPENSATION

Flexonics, Garlock, Hispan, Thermo-Tech. (If threaded, use in conjunction with unions.)

23 05 19 – METERS AND GAUGES

- A. Thermometers: Ashcroft, Duro, Marshalltown, Tel-Tru, Tetrice, Weiss, Weksler.
- B. Pressure gauges: Ashcroft, Duro, U.S. Gauge.
- C. Air filter gauges: Dwyer, Ellison.
- D. Flow measuring devices:
 - 1. 2" and smaller: Flow-set, Gerand, Presco
 - 2. 2-1/2" and larger: Barco, Dieterich Standard Corp., Gerand, Presco.
- E. Test plugs: Fairfax, Peterson, Sisco, Universal Lancaster.

23 05 23 – VALVES

Valves shall be accessible (within or immediately adjacent to equipment housings) and be able to isolate zones (supply and return).

- A. Globe, check valves: Jenkins, Lunkenheimer, Walworth
- B. Ball valves (full-port, only): Apollo, Nibco.
- C. Butterfly valves: Keystone, Nibco.
- D. Gas valves: DeZurik, ITT General, Walworth.
- E. Drain valves: Walworth, Josam.
- F. Plug valves: No plug valves are to be used in **LPS** hydronic systems.
- G. Gate valves shall not be used.

23 05 48 – VIBRATION CONTROL

Korfund, Mason Industries, Peabody Kinetics, Vibration Eliminator Co., Vibration Mountings & Controls.

23 05 53 – MECHANICAL IDENTIFICATION

Line Guard, T& B Westline, W.H. Brady.

23 07 00 – MECHANICAL INSULATION

CertainTeed, Owens-Corning.

23 09 00 – CONTROLS AND INSTRUMENTATION

Coordinate new and existing equipment with **LPS** Metasys DDC control system by Johnson Controls. All controls shall be BACnet MSTP compatible and interface with the existing JCI ADX Platform.

23 21 00 – HYDRONIC SPECIALTIES

- A. Expansion tanks: See Section 22 12 00.
- B. Air separators: Bell & Gossett, Taco, Wilkerson.
- C. Relief valves: Watts Regulator Co., McDonnell & Miller, Inc.
- D. Combination check and shut-off valves: Crane Co., Lunkenheimer.
- E. Combination pump inlet and strainer fittings: Bell & Gossett.
- F. Pressure reducing valves: Bell & Gossett, Taco, Watts Regulator Co.
- G. Note: Braided metallic lines shall not be used with hydronic systems in LPS facilities.

23 22 16 – STEAM SPECIALTIES

- A. Steam traps: Dunhan-Busch, Hoffman, Sarco.

- B. Steam air vents: Acme, Hoffman.
- C. Steam pressure reducing valves: Watts Regulator Co.
- D. Steam pressure relief valves: Watts Regulator Co., McDonnell & Miller, Inc.

23 23 00 – GLYCOL SYSTEMS

Glycol solutions: Ashland, Colorado Petroleum Products Co., Dow Chemical, Industrial Chemicals Corp., Siegel Oil Co.

23 31 00 – DUCTWORK

- A. Acoustical plenum: Aerocoustics, DynaSonics, Environmental Air Products, Gale, Industrial Acoustics, Koppers, Semco.
- B. Fiberglass ductwork: Not acceptable.
- C. Duct lining: Owens-Corning.

23 33 00 – DUCT ACCESSORIES

- A. Air flow measuring station: Brant, Air Monitor, Cambridge.
- B. Acoustical sound attenuator: Aerocoustics, DynaSonics, Enelco, Gale, Environmental Air Products, Industrial Acoustics, Semco, United Acoustical.

23 34 00 – AIR DISTRIBUTION EQUIPMENT

- A. Centrifugal roof, wall up-blast fume exhaust fan: Barry, Carnes, Greenheck, Jenn-Air, Penn.
- B. Centrifugal ceiling exhaust fan: Carnes, Greenheck, Jenn-Air, Penn.
- C. Propeller wall exhaust fan: Carnes, Greenheck, Jenn-Air, Penn.
- D. Utility fan: Barry, Greenheck, New York Blower, Trane, York.
- E. Centrifugal fan: Barry, New York Blower, Pace, Trane, York.
- F. In-line tubular centrifugal fan: Greenheck, Penn, Barry, Greenheck, New York Blower, York.
- G. In-line vane axial fan: Barry, New York Blower.
- H. Cabinet fan: American Air Filter, Greenheck, Trane.
- I. Roof hood: Carnes, Greenheck, Penn, Vent Systems.

23 36 00 – AIR TERMINAL UNITS

Anemostat, Carnes, Trane.

23 37 13 – AIR DISTRIBUTION DEVICES

Registers, grilles and diffusers: Anemostat-Waterloo, Carnes.

23 41 00 – AIR FILTERS

American Air Filter, Farr, Airguard.

23 51 00 – CHIMNEYS AND BREECHING

Prefabricated chimneys: Van Packer.

23 52 00 – BOILERS

- A. **CAST IRON BOILERS:** Burnham, H.B. Smith, Peerless, Weil-Mclain.
- B. **CAST IRON MODULAR BOILERS:** Hydrotherm, Weil-Mclain.
- C. **PACKAGED STEEL WATER TUBE BOILERS:** Bryan, Cleaver-Brooks.
- D. **PACKAGED STEEL FIRE TUBE BOILERS:** Cleaver-Brooks, Kewanee.
- E. **FORCED DRAFT CONDENSERS:** Patterson-Kelley, AERCO.
- F. **FORCED DRAFT NON-CONDENSERS:** Patterson-Kelley, AERCO.

23 57 00 – HEAT EXCHANGERS

- A. Steam/water to water heat exchanger: Bell & Gossett, Taco.
- B. Air to air heat exchanger: Pace.

23 64 19 – RECIPROCATING CHILLERS

Carrier, McQuay, Trane.

23 65 00 – COOLING TOWERS

- A. Induced-draft cooling tower: Baltimore Air Coil, Ceramic Cooling Tower Co., Marley Cooling Tower Co.
- B. Blow-through cooling tower: Baltimore Air Coil.

23 72 00 – IN-DUCT COILS

Carrier, McQuay, Trane, York.

23 73 00 – AIR HANDLING UNITS

American Air Filter, Carrier, McQuay, Pace, Trane, York.

23 74 00 – PACKAGED ROOFTOP UNITS

- A. Single-zone heating and air conditioning rooftop units (commercial quality): Carrier, Lennox, McQuay, Trane, York, Daikin.
- B. Multi-zone heating and air conditioning rooftop units: Carrier, McQuay.
- C. Heating and ventilating rooftop units (commercial quality): McQuay, Reznor.

23 81 23 – COMPUTER ROOM AIR CONDITIONING UNITS: Liebert. See also applicable sections of Division 27.

23 81 26 – SPLIT SYSTEM AIR CONDITIONING EQUIPMENT

Carrier, Lennox, McQuay, Trane, York, Daikin.

23 82 00 – TERMINAL HEAT TRANSFER UNITS

- A. Unit ventilators: Replacement of existing, only; not acceptable for new installations.
- B. Vertical Air Handlers: Airedale, Temspec, Change'Air
- C. Fin-tube radiation: American Air Filter, Trane.
- D. Cabinet heaters, unit heaters, convectors: American Air Filter, McQuay.
- E. Fan-coil units: American Air Filter, McQuay, Trane, York.
- F. Water-source heat pump: Only with pre-approval by **LPS**.
- G. Gas-fired unit heaters and duct heaters: Reznor, Trane.
- H. Gas-fired unit heaters and duct heaters (sealed combustion type): Reznor.
- I. Gas-fired infrared heaters: Roberts-Gordon (Co-Ray-Vac).
- J. Electric fin-tube radiation: Not acceptable.
- K. Electric cabinet heaters (prefer not to use): Airtherm, Trane.
- L. Electric unit heaters (prefer not to use): Trane.

★ END OF DIVISIONS 20-25 ★

DIVISION 26 – ELECTRICAL

26 01 05 – TEMPORARY WIRING – Special safety considerations are required for temporary wiring installations in school buildings. All OSHA and NEC standards shall be met, as well as state and local building codes. The Contractor shall be responsible for any personal injury or property damage resulting from temporary wiring improperly installed or improperly protected.

26 01 15 – EXISTING WIRING – No additional loads will be attached to existing circuits except by permission of authorized **LPS Operations, Maintenance and Construction (OMC) Department** representatives.

26 05 00 – BASIC ELECTRICAL REQUIREMENTS –

- A – WORKMANSHIP** – Installation shall be performed in a neat and workmanlike manner and in accordance with all applicable local, State, and national code requirements. All installation shall be performed by licensed electricians and apprentices, who shall be on-site at all times while work of their trade is being performed, with licenses in their possession to be presented upon request as required by regulations.
- B – CONDUIT AND CABLING** – Existing building piping shall not be used except by specific permission of an authorized **OMC Department** representative. New conduit and cabling shall be aligned parallel and perpendicular to building structure and shall be concealed except in equipment rooms or by permission of the **OMC Department**. All rooftop-installed raceways shall be steel and be properly supported by Unistrut-type roof stands (Miro Industries, B-Line, etc.); all such fabrications shall be submitted for **OMC Department** approval.
- C – CONDUCTORS** – Conductors of 50 volts or more shall be installed in approved raceways. Cabling of less than 50 volts when not installed in approved raceways shall be plenum rated.
- D – INSULATION PROTECTION** – Electrical conduit shall be properly reamed to prevent damage to wire insulation.
- E – PIPE CUTTERS** – Plumbing-type pipe cutters shall not be used on electrical conduit except when used for cutting ridged pipe (GRC) and proper care is taken not to reduce internal diameter.
- F – BOX SUPPORT** – Boxes in walls shall be securely fastened in such a manner as not to rely on cover trim plate for support.
- G – PENETRATIONS** – Penetrations shall be made in such a way as to maintain structural integrity and firewall rating. Non-firewalls will be patched as required to prevent environmental air from passing from one zone to another. All penetrations will be sealed with expanding foam to prevent airflow by 98 percent minimum or as required by standards of Underwriters Laboratories Fire Resistance Directory, current edition, or applicable Code or AHJs. Roofs and outside walls will be properly sealed to prevent leakage.
- H – LABELING** – Panel boards, switch gear, and motor control centers shall have permanent, engraved plastic nameplates clearly designating equipment or panel and will include a complete typewritten list identifying circuit use and location. When circuits are

added to existing panels, new circuits shall be clearly identified. Junction boxes shall be identified with panel and circuit number. Concealed or mechanical room junction boxes shall be labeled on outside of cover; exposed junction boxes shall be labeled on inside of cover. All device cover plates shall be labeled with panel and circuit numbers.

- I – **MATERIALS AND EQUIPMENT** shall comply with **LPS** list of acceptable manufacturers and products. (See Appendix, this Division.)

26 05 01 – SPECIAL ELECTRICAL CONDITIONS

- A – **EACH MAIN ELECTRIC PANEL** shall be oversized 25 percent to assure power and circuit breaker capacity for future requirements occurring after occupancy.
- B – **MERCURY VAPOR LAMPS** and incandescent bulbs are not acceptable.
- C – **BUILDING EXTERIORS**, when lighted for security purposes, are to utilize LED lighting controlled through photo cells. Exterior fixtures shall be vandal resistant. Parking lot lighting shall be controlled by both photo cells and time clock for energy management purposes.
 - 01 – **PHOTO CELLS** to be Tork 2101 or 2104.
 - 02 – **TIME CLOCKS** to be Intermatic ET70115C, ET70115CR, ET70115CR8, ET70115CR24, ET70215C, ET70215CR, ET70215CR8 or ET70215CR24.

Substitutions must have written approval from the **LPS Operations, Maintenance and Construction (OMC) Department**.

- D – **SUFFICIENT ELECTRICAL CHARACTERISTICS** and capabilities shall be provided to support Classroom and Office computer installations. A minimum of two dedicated 20amp circuits shall be provided to each classroom excluding computer rooms, which require special consideration.

26 05 05 – SELECTIVE ELECTRICAL DEMOLITION

- A – **PERSONNEL** – Demolition required during construction shall be performed by qualified electrical personnel in such a manner as not to interrupt or destroy the integrity of existing systems.
- B – **RECONNECTION** – All systems that are disconnected due to construction needs, including phone, PA, Security or computer systems, shall be reconnected upon completion of the project. Exceptions must be authorized, in writing, by the **LPS Operations, Maintenance and Construction (OMC) Department**. The Contractor assumes the responsibility of reporting all system deficiencies, in writing, to the **OMC Department** prior to commencement of work on the project. All systems will be considered fully functional and operational prior to project commencement unless properly reported as described here.
- C – **REMOVAL** – All abandoned electrical conduit wiring and devices shall be removed and existing holes patched. Abandoned circuits and feeders shall be removed all the way back to panels.

- D – **REINSTALLATION** – It shall be the responsibility of the Contractor to ensure proper installation and operation of existing electrical systems that may be affected by construction.
- E – **TECHNOLOGY INFRASTRUCTURE** – See also LPS Guideline Specification Section 02 41 19 re coordination with the **LPS ITS Department** for any work involving existing technology infrastructure in or around LPS facilities.

26 05 09 – ELECTRICAL OUTAGES – Outages of any kind involving existing building systems will be scheduled in advance with the authorized **LPS Operations, Maintenance and Construction (OMC) Department** representative. Life safety systems must remain functional while a building is occupied. Any exceptions must be prearranged with and authorized by the **OMC Department**.

26 05 95 – FINAL ACCEPTANCE AND SYSTEM DEMONSTRATION – All electrical equipment will be demonstrated as being fully functional. Installation, adds, changes, or modifications to new or existing fire alarm, temperature control, intercom, or any other control function-type systems shall be demonstrated to the authorized **LPS Operations, Maintenance and Construction (OMC) Department** representative(s) as fully functional before final acceptance. The cost of repairing any damage to existing systems due to improper equipment or improper wiring shall be the responsibility of the Contractor.

26 19 00 – SERVICE AND DISTRIBUTION – Provide underground service from Utility Company lines to transformers and service equipment at load center location.

- A – **STANDBY SERVICE** – Provide automatic emergency standby power source as required by applicable codes and regulations fueled by natural gas.
- B – **DISTRIBUTION PANELS** – Circuit breaker type of the "quick-make, quick-break" switch and fuse unit type.
- C – **SECONDARY FEEDERS** – Conductors #6 or smaller shall be copper; those larger than #6 may be aluminum, provided that connectors shall be those specified by the manufacturer solely for aluminum conductors and shall be torqued in strict accordance with manufacturer's specifications.

26 50 00 – LIGHTING - Conform to UL and local requirements, except where **LPS Standards or Operations, Maintenance and Construction (OMC) Department** requirements are more stringent. The maximum electrical power used to provide general lighting for new construction or a Remodel area shall be one watt per net square foot overall, with variations per area to comply with recommendations from the Illuminating Engineering Society standards.

- A – New **LIGHT FIXTURES** shall be LED, except as noted below or as pre-approved by the **OMC Department**. Standard fixtures shall comply with the **LPS** list of acceptable manufacturers and products. (See Appendix, this Division.)

T-8 or T-5 fluorescents are to be used where they currently exist unless 80% of the light fixtures in the space are being replaced. All ballasts are to be electronic type with 5-year warranty (General Electric or Advance, only) and are to be compatible with existing system. No series-wired ballasts are permitted.

- B – BULBS AND FLUORESCENT TUBES** will be of an energy-efficient type approved for use by the **OMC Department**.
- C – DIMMERS** must be provided on Computer Room lighting. All dimmers shall be non-resistive energy efficient type, except as necessary for stage lighting.
- D – EMERGENCY LIGHTING** – All exit and emergency lighting must be powered by emergency systems, with 20-minute battery backup for emergency/night lights. LED exit signs shall be used in new construction and remodel areas. Exit lights are to be Lithonia Model #LQMSW3RELN 120/277 (add ELM to number for battery backup). Interior dual emergency lights shall be Dual-Lite LZ2 type. Substitutions require written approval from the **OMC Department**.
- E – SWITCHING** – Switching will allow for use of natural light in portions of any room or area where conditions will permit and shall follow applicable Code. Hallways and passage areas shall allow for two levels at full and reduced occupancy, and classrooms shall allow for a minimum of two levels, with switching available at several convenient locations so as to facilitate adjustment. Motion sensors will be used in all restrooms.
- F – AUTOMATIC CONTROLS** – Automated control of lighting shall comply with all applicable State and Federal standards and the 2009 IECC. Occupancy sensors shall be provided to shut off lights as per Colorado Energy Codes. Standard devices shall be manufactured by Lutron, only: Maestro occupancy sensing switches, PowPak Relay Modules with Softswitch, and wall-mounted wireless occupancy and vacancy sensors with XCT Technology.
- Note:** House lighting in theaters and other assembly/performance spaces must be tied into Fire Alarm systems so that lighting levels increase to Code-specified minimums upon alarm initiation.
- G – DESIGN CRITERIA/TASK ILLUMINATION LEVELS** – A range of lighting levels is presented due to the impracticality of obtaining and maintaining a specific footcandle number. Simple photometer measurement can only be used to define the quantity of illumination, not the quality. Lighting energy requirements are of major proportion, 31 to 37 percent of total energy requirements used in School and Office type buildings, so it becomes obvious that significant energy savings can be realized if it is possible to reduce energy demands of artificial illumination. Lighting levels in LPS schools shall follow recommendations of the IESNA Lighting Handbook, latest edition. (See also Table of Task Illumination Levels that follows.)

Table of Task Illumination Levels

Task	Range Of Foot-candle Power	Recommended Footcandle Power
Reading – Printed Material	30 to 50	35
Handwriting – Ink or Soft Pencil	50 to 80	60
Note Taking	30 to 50	40
Lab Work – Detailed Experiments	50 to 70	60
Sewing	60 to 80	70
Cooking	30 to 60	45
Computer Labs	30 to 50	40
Music Playing	40 to 60	50
Arts and Crafts Work	50 to 90	70
Drafting	70 to 80	75
Bench Work (Shops)	40 to 80	75
Offices	40 to 60	50
Conference and Interview Rooms	30 to 40	35
Library / Media Center	30 to 50	50
Locker Rooms	10 to 30	20
Gymnasiums	25 to 55	50 (HS), 30 (ES)
Pool Area	50 to 70	60
Theater / Auditorium	10 to 30	20
Lecture Rooms	30 to 50	40
Dining	10 to 30	20
Cleaning	10 to 20	15
Kitchen	50 to 90	70
Serving	30 to 60	45
Circulation (Corridors and Halls)	10 to 30	25
Stairways	10 to 20	15

The following technology systems, formerly under Divisions 13 and/or 26, are further summarized below and detailed fully in the LPS Model Specifications and Technology Standards, Divisions 27 and 28 (June 2016).

TECHNOLOGY INFRASTRUCTURE SYSTEMS

Technology Infrastructure systems will be defined for the purposes of this document as any Communications (voice, data, video, intercom, clock/bell program and public address), Security or Life Safety system. The term system will be defined as all of the components required for a fully functional operation meeting the stated purpose(s).

A – CABLING

- 01 – PLATFORM** for infrastructure Cabling shall be Commscope Uniprise structured cabling system, with components acceptable to the **LPS ITS Department**.
- 02 – DESIGN TEAMS** for infrastructure Cabling systems shall include a technology design consultant or engineer with a current Registered Communications Distribution Designer credential from BICSI (Building Industries Consulting Services, International).
- 03 – QUALIFIED CONTRACTORS** for infrastructure Cabling systems shall be CommScope Uniprise certified Installers based within a two-hour travel distance from Littleton Public Schools, with installation teams local to the State of Colorado.

B – COMMUNICATIONS

- 01 – PLATFORM** for Communications systems shall be Valcom Engineered Solutions (Class Connection), with compatible components as certified by Valcom and acceptable to the **LPS ITS Department**.
- 02 – DESIGN TEAMS** for Communication systems shall include a technology design consultant or engineer with a current Registered Communications Distribution Designer credential from BICSI (Building Industries Consulting Services, International).
- 03 – QUALIFIED CONTRACTORS** for Communications systems shall be Valcom Engineered Solutions (Class Connections) Authorized Distributors headquartered in the State of Colorado. Contractors shall have a minimum of five (5) years' experience in this specialized field and shall have completed a minimum of three (3) projects similar in scope to this project.

C – SECURITY

- 01 – PLATFORMS** for Security systems shall be as follows:
 - a – Physical Access Control** by Open Options and Aiphone
 - b – Video Management Systems** by 3xLogic
- 02 – DESIGN TEAMS** for Security systems shall include a physical security design consultant or engineer. The consultant or engineer shall possess a current credential from ASIS International or SIA (Security Industry Association).
- 03 – QUALIFIED CONTRACTORS** for Security systems shall be companies specializing in the design, fabrication and installation of physical security systems. Contractors must: be properly licensed to perform all work within the State of Colorado; have a minimum of five (5) years of experience in this specialized field; have completed a minimum of three projects similar in scope to this project; and be certified by the product manufacturer for the installation of the proposed manufacturer's solution through completion of the project.

D – LIFE SAFETY

- 01 – PLATFORM** for Life Safety systems shall be Notifier, with components furnished by Fire Detection Systems or Mountain Alarm only, or as acceptable to the **LPS Operations, Maintenance and Construction (OMC) Department**.
- 02 – DESIGN TEAMS** for Life Safety systems shall include a Fire Protection Engineer, who shall be a registered PE in fire protection engineering with a minimum of four (4) years' experience in fire protection and alarm engineering and a minimum NICET Level 3 in fire alarm systems.
- 03 – QUALIFIED CONTRACTORS** for Life Safety systems shall specialize in installing the products specified, with a minimum three (3) years' documented experience in such installations, and shall employ NICET Level 2 trained technicians to install the products specified. Programming and final testing shall be completed by the selected Notifier equipment distributor with oversight by a fire protection engineer.
- 04 – HOUSE LIGHTING** in theaters and other assembly/performance spaces must be tied into Fire Alarm systems so that lighting levels increase to Code-specified minimums upon alarm initiation.
- 05 – PULL STATION** shall be provided at each FACP for immediate alarm initiation.

APPENDIX – ELECTRICAL DIVISIONS

Specifications for Electrical Work shall incorporate the following **LPS** standard list of acceptable manufacturers and products, as applicable, with equals as pre-approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

26 05 33 – SURFACE METALLIC RACEWAYS AND FLOOR BOXES

Raceways: Wiremold 700 Series (preferred), or Walker.
Floor Boxes (poke-through, only): Hubbell, Wiremold.

26 05 36 – CABLE TRAY RACEWAYS

B-Line Systems, Globe, Husky-Burndy.

26 05 83 – WIRE CONNECTORS

Splitbolt, Setscrew, Compression, Wingnut, Wirenut, and Scotchlock wire connectors are acceptable. Push, Quick, Stab Lock and/or equivalent are prohibited.

26 09 36 – LIGHTING DIMMERS

Hubbell, Lutron.

26 18 00 – MOTOR AND CIRCUIT DISCONNECTS

General Electric, Square D, Siemens and Westinghouse.

26 22 00 – PAD-MOUNTED TRANSFORMERS

- A. Pad-Mounted: Westinghouse, General Electric, Square D, Siemens, Eaton.
- B. Dry-Type: General Electric, Westinghouse, Square D, Siemens, Eaton.

26 24 13 – DISTRIBUTION SWITCHBOARDS

General Electric, Siemens, Square D, Westinghouse, Eaton. (If panel cover is one piece, it is to be the hinged.)

26 24 16 – BRANCH CIRCUIT PANELBOARDS

General Electric, Westinghouse, Siemens/ITE, Square D, Eaton. (Bolt-in breakers, only. Panels are to be hinged.)

26 24 19 – MOTOR CONTROL CENTERS

General Electric, Square D, Westinghouse, Siemens, Eaton.

26 25 00 – ENCLOSED BUS ASSEMBLIES

General Electric, Square D, Westinghouse, Siemens, Eaton.

26 27 13 – METERING

- A. Meter mounting device (as approved by Xcel): Crouse-Hinds, Durham, Landis & Gyr.
- B. Current transformer enclosure (as approved by Xcel): Erikson, Hoffman.

26 27 19 – MULTI-OUTLET ASSEMBLIES

Hubbell, Wiremold.

26 27 26 – WIRING DEVICES

- A. Wall Switches: Hubbell, Leviton. (No quick-connector or residential.)
- B. Device Plates: Leviton, Mulberry, Stenco. (Metal only, no plastic or nylon.)
- C. Receptacles: Hubbell, Leviton. (No quick-connector or residential.)

26 28 00 – OVERCURRENT PROTECTIVE DEVICES

Circuit breakers (bolt-in only; by same manufacturer as panelboard, disconnecting device, etc.): General Electric, Siemens/ITE, Square D, Westinghouse.

26 29 13 – MOTOR STARTERS

- A. Magnetic motor starters (full voltage, no light-duty): General Electric, Square D, Westinghouse, Siemens.
- B. Manual motor protection switches: General Electric, Square D, Westinghouse, Siemens.

26 32 13 – ENGINE GENERATOR SETS

Natural Gas units, only: Generac, Onan or equal as pre-approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

26 36 23 – AUTOMATIC TRANSFER SWITCHES

Match generator: ASCO, Generac, Onan, General Electric.

26 51 13 – LIGHT FIXTURES

- A. Standard 2' x 4': Acuity Lithonia, LED Troffer, 4000K - Model 2GTL4 LP840; alternates: GE Model BT240A2APWHITE or Philips Day-Brite Model 2TG48L840-4.

- B. Standard 2' x 2': Acuity Lithonia, LED Troffer, 4000K - Model 2GTL2 LP840; or equal by GE or Philips, as approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.
- C. Decorative (e.g., lobbies) 48x24in.: CREE, LED Troffer, 4000K, 4000L, 44W - Model CR24-40L-40K-S
- D. Decorative 24x24in.: CREE, LED Troffer, 4000K, 35W - Model CR22-32L-40K-S
- E. Decorative (high-mount) 48x24in.: CREE, LED Troffer, 4000K, 5000L, 50W - Model CR24-50L-40K-S
- F. Wraparound: Acuity Lithonia, LED Wraparound, 1x4, 4000K - Model LPB4 LP840
- G. Wet Areas: Acuity Lithonia, LED Vapor Tight, 4000K, 24W, 47 InL - Model XWM LED
- H. Small-area wall-mount Security Light: Lumark Crosstour LED, 3500K, 20W - Model XTOR2A
- I. Large-area wall-mount Security light: Lumark, Crosstour Maxx LED, 3500K, 50W - Model XTOR5A-N
- J. Exterior Area Light: CREE Area Light, Bronze, 133W, Type V, 10253L - Model BXAL1508D-UCZ7 (Note: Size watts and fixture to pole height.)
- K. Exit Signs: Acuity Lithonia Exit Sign with Battery Backup - Model LQMSW3RELN
- L. Emergency Lights: Dual-Lite wall-mount Indoor Emergency Light, LZ-series LED.

26 51 15 – LAMPS

- A. 28WT8 lamps for electronic ballasts (existing or replacement fluorescent fixtures, only): General Electric, Westinghouse, Sylvania, Phillips, Osram.
- B. Where special lamps are indicated, furnish exactly as specified and pre-approved by the **LPS Operations, Maintenance and Construction (OMC) Department**.

26 51 17 – BALLASTS, CONTROLS AND ACCESSORIES

- A. Electronic ballasts with 5-year warranty: General Electric, Advance.
- B. Lighting occupancy sensors: Lutron, only. (Maestro sensing switches, PowPak relay modules, wall-mounted wireless sensors.)
- C. No series ballasts allowed.

26 56 13 – LIGHTING POLES AND STANDARDS

- A. Lighting poles shall be constructed so that all metallic parts are continuously grounded, with grounding stud inside hand-hole.
- B. Poles shall be set on concrete base, with top elevation 3'-0" above grade at parking areas and 6" above grade at all other areas.
- C. Pole material and wall thickness shall be sufficient to support effective projected area of luminaire and pole, without damage to lamp filaments, for a wind-gust factor of 130 mph.

26 83 13 – ICE- AND SNOW-MELT CABLE

Raychem. (See also LPS Model Spec Section 23 83 13.)

★ END OF DIVISIONS 26 - 28 ★

DIVISIONS 31-33 – SITE IMPROVEMENTS

31 10 00 – SITE PREPARATION – Include clearing, grubbing, and tree, shrub, and sod removal or relocation as per instructions by the **LPS Operations, Maintenance and Construction (OMC) Department**; stockpiling of reusable topsoil and squeegee; protection of trees, shrubs and groundcovers remaining on job site and adjacent properties. **Rototill 12"** using topsoil and sterilized compost in planters and lawn areas.

31 20 00 – EARTHWORK – Include site grading, rock removal, excavation, trenching, backfilling, granular fill, compacting, and finish grading.

31 25 00 – DRAINAGE AND DUST CONTROL – Contractor(s) shall adhere to Cities of Littleton or Centennial, Arapahoe County and State of Colorado regulations for erosion and fugitive dust control during construction. Proper work sequencing is responsibility of Contractor(s) to prevent erosion damage to work performed under the Construction Contract, to existing site improvements, and to adjoining properties.

31 63 00– DRILLED CAISSONS – Include, as necessary: excavation, drilling, casing, concreting of shafts for drilled piers; provision of steel casings, reinforcing, anchor bolts, dewatering, disposal of excavated materials, and cleaning of loose debris from bottom of excavation; provide unit prices for extra charges or credit for caissoning below or above established bid depth elevation(s). Suitable bearing elevation(s) to be confirmed by Soils Engineer during drilling.

32 01 31 – VEHICULAR TRAFFIC – Bus and auto loading and unloading shall be developed on perimeter of site(s). Student loading and unloading are from right-hand side of bus. **CROSS-TRAFFIC FLOW BETWEEN CARS, BUSES AND STUDENTS IS NOT ACCEPTABLE.**

32 10 00 – PAVING AND SURFACING – Include walks, circulation and parking paving, and associated accessories. Parking areas, tennis courts, drives, sidewalks, and other exterior flatwork shall be placed on nonexpansive soils as recommended, selected, and approved by Soils Engineer.

- A – PARKING AREAS** are required for faculty, administrative staff, visitors, maintenance vehicles, and high school students. Space(s) may be provided 50-50, standard to compact size; however, standard size preferred throughout.
- B – SERVICE TRUCK TRAFFIC** should be developed for each site and kept separate from other traffic and parking. Provisions shall be made for turnaround immediately adjacent to unloading area(s) and allowance(s) for deliveries and pickups as follows:
 - 01 – DAILY PICKUP** of trash. Include dumpster or roll-off location and 8-inch thick, rebar-reinforced concrete slab on compacted subsoil to carry loaded container and truck without cracking.
 - 02 – WEEKLY DELIVERY** of school and custodial supplies.
 - 03 – SUPPLIER** deliveries on occasional basis.
 - 04 – FOOD SERVICE** supply to Kitchen.

05 - SPACE for one LPS Operations, Maintenance and Construction (OMC) Department vehicle.

C – ACCESS ROADS:

01 – MINIMUM 16' wide for one-way traffic.

02 – MINIMUM 24' wide for two-way traffic.

03 – SIGNED AND PAINTED for "NO PARKING ALLOWED."

D – CONCRETE CURB AND GUTTER – Typically 6" vertical curb with 24" gutter pan; "Hollywood" type in areas approved acceptable by the **OMC Department**.

E – ASPHALTIC CONCRETE PAVING – Minimum 4" compacted asphaltic concrete granular wearing surface on prime coat over minimum 6" compacted granular base course on compacted sterilized earth subgrade for automobile parking areas; minimum 6" compacted asphaltic concrete granular wearing surface on prime coat on minimum 8" compacted granular base course on compacted sterilized earth subgrade for service and access roads. Appropriate full-depth asphalt will be considered as an Alternative by **LPS**.

F – CONCRETE PAVING – Medium broom finish, sealed, minimum 8" thick, steel rod-reinforced concrete slabs (minimum 6" reinforced concrete in refuse disposal areas) on minimum 4" thick compacted granular fill on compacted sterilized earth subgrade as determined by **A/E**.

G – CONCRETE WALKS – Medium broom finish, sealed, minimum 4" thick, steel rebar-reinforced concrete slabs (6" thick unreinforced) on minimum 3" thick compacted granular fill on compacted sterilized earth subgrade; 8'0" preferred width, 6'0" absolute minimum; location(s) most advantageous to shortcuts for student use to and from playgrounds, streets, and parking.

H – STRIPING AND STENCILING – One coat white or yellow traffic paint as specified.

I – WHEELSTOPS – Minimum 6" x 6" x 6'0" precast concrete curbs, with driven 5/8" round by 2'0" long deformed steel reinforcing rod anchors at each end; provide wherever parking abuts curbless walks and landscape termination(s).

J – AGGREGATE WALKS – 6'0" wide preferred, up to 8'0" wide acceptable; min. 4" thick, with Granite Sand or crusher fines (from Aggregate Industries or approved equal).

32 14 00 – UNIT PAVERS – Material(s), thickness(es), size(s), shape(s), color(s), location(s), pattern(s), finish(es), waterproofing(s), bedding(s), coating(s), compliance(s), protective(s), grout, and mortar as determined by the **A/E** with **LPS** approval.

32 17 00 – SIGNS, SIGNALS, MARKINGS on school property shall conform to "Uniform Traffic Control Device Manual" published by Colorado Department of Highways, Planning, and Research Division, and **LPS** sign standards. Signage(s) shall be approved in advance by the **LPS Operations, Maintenance and Construction (OMC) Department**.

32 18 00 – PLAYFIELDS –

A – FOR PROTECTION OF CHILDREN avoid the following:

- 01 – Steep Slope(s)** – Maximum 1 foot vertical in 50 feet horizontal unless sodded.
- 02 – Open Drain Swales** across Playgrounds or Playfields.
- 03 – Retaining Walls**
- B – PROVIDE MEANS** to exclude autos, buses, trucks and motor scooters from playground area(s).
- C – PROVIDE PROTECTED ACCESS WAYS** at normal lines of pedestrian traffic.
- D – PROVIDE ACCESS** for sweepers and snow removal equipment to playfields, and minimum 16-foot wide access from major street(s) for fire trucks.
- E – ATHLETIC SURFACES –**
- 01 – Synthetic Turf Fields** – Monofilament Synthetic Turf system:
- a – Carpet:** tufted UV-resistant polyethylene fibers in perforated or permeable backing; minimum 45-oz. face weight; backing grab tear strength (X – Y) > 250-400 lbs. minimum
 - b – Infill Mix:** all-rubber graded SBR mix (no sand allowed), spread with an SMG SandMatic mechanically-driven rubber infill injection/leveling system
 - c – Standards:** must maintain a G-Max rating of between 100-120 on the field held Kleg Hammer Scale for the entire 8-year life of the system.
 - d – Approved Manufacturers/Products:** ACT Global SX 60, Greenfields Slide Max XQ or Shaw Sports Turf Powerblade Bolt. Slit Film or Hybrid systems (lower face-weight) from same manufacturers may be considered, in consultation with the **LPS Operations, Maintenance and Construction (OMC) Department**.
 - e – Options:**
 - Slit Film or Hybrid systems (lower face-weight) from same manufacturers may be considered, in consultation with the **OMC Department**
 - subsurface perimeter drainage system for on-site storm water control; Nyloplast or equal pre-approved by the **OMC Department**.
- 02 – Baseball Fields** – Infield mix shall be “Stabilized Gold Infield Mix”, a mixture of 29% silt and clay and 71% sand by volume, fortified with organic binders. Available from All-American Sports Materials, a division of Best Way Concrete and Aggregate (contact: Bill Schell, 970-539-1418).
- 03 – Running Tracks** – Secondary school sites shall have cast-in-place, durable, resilient, all-weather running tracks; minimum ½”-thick rubber surface course consisting of liquid binder and specifically graded SBR with a gradation of 0.5-4.0mm; sealed, and topped with two structural spray layers of liquid binder and EPDM colored rubber granulate graded at 0.5-1.5mm, applied uniformly at a minimum rate of 1.5 lbs. per sq. yd. per coat and sprayed in opposite directions to achieve a uniform application. Approved manufacturer: Fisher Tracks, Inc., or equal pre-approved by the **OMC Department**.
- a** – High School tracks shall be polyurethane-based.
 - b** – Middle School tracks shall be latex-based.
- 04 – Tennis Courts** –
- a** – All new tennis courts shall be post-tensioned concrete.

- b – Existing asphaltic concrete courts shall be patched and crack-filled as needed, recoated and striped as directed by **LPS**. More severely damaged courts may require a 2-inch overlay of asphaltic concrete on a geotextile mat in addition to patching and crack-fill, plus new top-coat and striping, as determined in consultation with the **OMC Department**.

32 31 00 – SECURITY FENCE AND GATES – Chain-link type with manual operating and lockable swinging or sliding gate(s), galvanized fabric (minimum 9-gauge, knuckle to knuckle), posts, bracing and hardware. Vehicle gates must be minimum 10' across; two 5' gates are acceptable.

32 33 13 – BICYCLE RACKS – Brandir International RIBBON RACK model RB-7 or **LPS**-approved equivalent, hot dipped galvanized per **ASTM A53** Spec for Pipe; Steel, Black, and Hot Dipped, Zinc-Coated Welded and Seamless, Schedule 40 pipe 2.375" o.d. by 0.154" wall; anchored as necessary against vandalism or theft.

32 80 00 – IRRIGATION SYSTEM(S) – Provide underground automatic sprinkler system utilizing Rainbird controllers and valves and Rainbird or Hunter heads. PVC mainline piping of 160 psi gained with complete bell joints; joints with clean coat, then special glue; plastic pipe laterals with stainless steel clamps; swing joints. System design and head selection shall treat water-efficiency as a primary criterion for each area, based on location, contours, drainage, adjacent structures, shading and plantings.

A – PARTS AND MANUFACTURERS:

- 01 – Valves** – Rainbird PEB (brass or plastic)
- 02 - Heads** –
 - a – Rainbird Falcon spray pop-ups
 - b - Hunter MP rotators (I-40, I-25, I-20)

32 90 00 – LANDSCAPING – Relocate salvageable trees and shrubs. Provide new trees, shrubs, plants, grass or sod where existing will be contaminated or destroyed; include topsoil, soil preparation, fine grading in new planting areas, fertilizing, planting, guying, and staking; maintenance through one-year guaranty/warranty period.

- A – TOPSOIL** – Use good existing soil as available on-site; off-site material: sandy loam, ripped 4" to 6" after spreading; minimum pH factor 7; free from subsoil stones, stumps, roots, weeds, clay lumps and debris over 1" diameter.

- 01 – ATHLETIC FIELDS** – 8" deep with less than 20 percent clay; 3" per hour permeability desirable.

B – SOIL AMENITIES:

- 01 – COMPOST** – Well-rotted, unleached, no animal manure/fertilizer, and reasonably free from shavings, sawdust, refuse and harmful materials.
- 02 – PEAT HUMUS** – Shredded peat, low mineral and wood content, minimum 50 percent decomposed organic matter by weight, oven dry.
- 03 – SUPERPHOSPHATE** – Soluble mixture of treated minerals; 20 percent available phosphoric acid.

- 04 – **COMMERCIAL FERTILIZER** – Neutral character with some elements derived from organic sources, as follows:
 - a – *Spring Application formula: 28-7-7-65-3FE* (50% nitrogen from sulfur-coated urea).
 - b – *Fall Application formula: 12-11-11-55-3FE* (quick-release nitrogen).
- 05 – **PLANT BED MULCH** – Red Cedar mulch is to be used at a minimum thickness of 3". Alternative, with pre-approval by LPS, is ¾" granite rock mulch,

C – GRASS –

- 01 – **SOD** – Strongly rooted **1/3 Barton, 1/3 Merion, 1/3 Nugget** for typical lawn areas; Fescues and Ryes may be included for athletic fields, if approved in advance by the **LPS Operations, Maintenance and Construction (OMC) Department**. Large roll application; minimum 1" thickness; free of holes; sufficient density to prevent tearing or stretching while unrolling; not less than two years old; free of weeds and undesirable native grasses.
- 02 – **SEEDING** – Standard Dryland Seed Mix, by weight percentage for each species:
 - 20% Crested Wheatgrass "Fairway"
 - 20% Western Wheatgrass "Arriba" or "Barton"
 - 20% Smooth Brome "Lincoln" or "Manchar"
 - 20% Tall Fescue "K-31"
 - 10% Sideoats Grama
 - 10% Blue Grama
- 03 – **HILL AND PERIMETER AREAS** above 1 ft. in 3 ft. slope may be native grass.

D – MISCELLANEOUS MATERIALS:

- 01 – **WRAPPING** – Tree-wrap tape not less than 4" wide, designed to prevent sun scald and dehydration, extending above guy-wire height. Include a plastic tube slit down one side and fit over tree trunk to prohibit infestation by bugs.
- 02 – **WOOD STAKES & GUYS** – Provide in accordance with good practice.

E – EXCAVATION FOR TREES AND SHRUBS:

- 01 – **EXCAVATE** pits, beds and trenches with vertical sides and with bottom of excavation slightly raised at center for proper drainage.
- 02 – **MAKE EXCAVATIONS** for balled-and-burlap or container-grown stock at least twice as wide as ball diameter; ball to rest on unexcavated or compacted subsoil. Do not over-excavate planting pit depth.
- 03 – **FOR CONTAINER GROWN STOCK**, excavate as specified for balled-and-burlap wrapped stock, except conform to container width and depth. Cut root balls vertically from top to bottom 1" into side in at least three locations around the ball.
- 04 – **DISPOSE** off-site all unacceptable subsoils removed from landscape grading and excavations.
- 05 – **MIX** two parts topsoil to one part each of peat and manure. Use for setting and filling all plants where existing soil is unacceptable for backfill.

- 06 – WHERE RUBBLE FILL IS ENCOUNTERED**, prepare planting pits properly by removal of rubble or other acceptable methods.
- F – MECHANICAL SPADE PLANTING** – Larger trees and shrubs may be planted by means of mechanical spade equipment at Contractor's option. Larger plants being moved from existing locations to new locations must be transplanted by this method. Use equipment that will dig, carry, and replant with the same unit. Equipment size must be adequate for size of plant and not less than 8" of space diameter at 15" of depth per caliper inch of trunk diameter. Contractor shall assume responsibility for contacting line location service and obtaining underground public utility locations prior to excavating.
- G – SODDING NEW LAWNS** – Area(s) to be sodded shall be fine graded and raked to meet LPS approved finish grade(s). Where sod adjoins paved areas, surface of sodded lawn shall be approximately 3/4" below pavement surface. Uniform grades shall be established between paving and other established elevations. Coarse soil lumps, rocks over 1/2" diameter, roots and weeds shall be removed. Surface of ground shall be firm and smooth and of fine texture immediately before placing sod. Sod shall not contain more than two percent other grasses and weeds, and shall be free of objectionable weeds such as crabgrass, bentgrass, tall fescues, clover, dandelions, plantain, thistle, bindweed, etc.
- 01 – LAY SOD** within 24 hours from time of stripping. Do not plant dormant sod or if ground is frozen.
- 02 – LAY SOD TO FORM** a solid mass with tightly fitted joints. Butt the ends and sides of sod strips evenly, leaving no cracks. Do not overlap joints; stagger strips to offset joints in adjacent courses. Tamp or roll lightly to ensure contact with subgrade after first watering.
- 03 – SECURE SOD ON SLOPES** with wood pegs to prevent slippage.
- 04 – WATER** sod thoroughly with a fine spray immediately after planting.
- H – MAINTENANCE** – Furnish by Contractor for 90 calendar days as follows:
- 01 – IRRIGATION** shall start immediately after 300 square feet of sod is installed to ensure against shrinkage of or damage to sod.
- 02 – PERFORM** routine maintenance of watering, weeding and mowing of grass. Do necessary weeding, reseeding, resodding and removal of dead material(s). Fertilize sod twice during contract maintenance period.
- 03 – CONTRACTOR** shall erect signage, fencing, or barricades to prohibit traffic or playing on new lawns until notified after acceptance by LPS.
- I – SHRUBS AND TREES** –
- 01 – ALLOWED** – Native landscaping is desired, requiring little watering and minimum fertilizer.
- 02 – NOT ALLOWED** – No Cottonwoods (not even cottonless cottonwood); No Hedging; No Russian Olive trees, thorny bushes, or thorny trees. Trees without burlap ball roots are not acceptable.

- 03 – **TREES** shall be staked with not less than two stakes. Top of the ball crown must be at least 2" to 3" above the surrounding grade. All trees and shrubs must be watered immediately after planting.
- 04 – **WARRANTY** shall cover replacement of shrubs and trees as needed through one full calendar year.

33 00 00 – PIPED UTILITIES – Underground water, natural gas, sanitary and waste service, distribution and transmission systems as per applicable code(s) and public utility provider(s).

33 40 00 – DRAINAGE – Dewatering, foundation and underslab drainage systems as required by Soils Investigation Report(s). Site drainage preferably will be surface runoff, with drainage to basins and inlets where available or established to area drains; corrugated metal pipe culvert permitted if property entry is off frontage road.

- A – **PARTICULAR ATTENTION** shall be given to ground water, including seasonal fluctuations and surface water.
- B – **WEATHER AND NATURAL CHARACTERISTICS** of the site shall be considered, especially wind and soil conditions. A drainage study shall be submitted to the **LPS Operations, Maintenance and Construction (OMC) Department** for approval and acceptance prior to finalizing site layout. Study shall encompass flow, retention, and dispersal of water to and from the site.
- C – **POSITIVE DRAINAGE** shall be provided away from building(s). Consideration shall be given to discharging roof drains into a collector system. Where roof drains discharge onto site, set at base of bank, not on top. Discharges shall not cross over sidewalks or in close proximity to building parking area(s), and shall be away from building(s).
- D – **LPS STANDARDS:**
 - 01 – **SLOPES ADJACENT TO BUILDING(S)** – Minimum 1:5, maximum 1:2 (or as approved by the **OMC Department** at existing facilities where the minimum slope is not achievable.)
 - 02 – **SLOPES NOT ADJACENT TO BUILDING(S)** – Minimum 2:100, maximum 1:4; no flat area(s).
 - 03 – **BUILDING FLOOR(S)** shall be minimum 7" above surrounding finish grades; ramps shall slope to top of walks.
 - 04 – **BERMS** will be permitted only with **OMC Department** approval and acceptance.

33 90 00– POWER AND COMMUNICATION – Underground electrical, telephone, and cable service, supports and distribution as per applicable code(s) and public utility provider(s) LPS Technology Standards. Confirm existing underground service lines with the LPS ITS Department prior to beginning design for any sitework or building addition.

END OF DIVISIONS 31-33