



## KLEIN INDEPENDENT SCHOOL DISTRICT FACILITY AND SCHOOL SERVICES DEPARTMENT

### STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES

#### OWNER AND DESIGN PROFESSIONAL AGREEMENT

The following standards are provided as a guideline for design professionals working on Klein ISD projects.

The OWNER has many years of operational experience with hundreds of products, services and designs. The OWNER desires to have a competitive specification and does not intentionally exclude products, services or designs without good reason. Unless otherwise approved in writing, or by email, it is the assumption of the OWNER that these standards have been followed precisely by all design professionals and that only products listed or approved by the OWNER have been specified. These standards are considered minimum criteria and are not intended to restrict the use of products, services or designs that exceed these criteria.

The OWNER is very serious about the use of the term “approved equivalent”. Approved equivalent is defined as prior written or email approval by an OWNER’S representative to use equivalent products, services or designs. Design professionals are not allowed to approve product substitutions during the design, bidding or submittal process without the OWNER’S written or email approval.

Design professionals should consider including features of high performance/sustainable/green schools as defined by the Sustainable Buildings Industry Council as facilities that are healthy and productive for students and teachers (acoustic, thermal, and visual comfort; natural daylight; superior indoor air quality; safe and secure); cost effective (optimized energy performance, life cycle approach to cost of Ownership, and a commissioning process); and sustainable (energy conservation; high-performance mechanical and lighting systems; environmentally preferable materials; and water-efficient design). The OWNER supports the Collaborative for High Performance Schools.

Nothing in this document is intended or shall be interpreted in such a way as to prevent design professionals from meeting all applicable building codes, life safety codes, energy codes, etc. Design professionals who seal the construction documents shall have responsibility for ensuring all applicable design standards are met.



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**NOTE: Changes to this document from the previous revision are highlighted in yellow.**

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**DIVISION 00**

**PROCUREMENT, CONTRACTING, AND CONSULTANT REQUIREMENTS**

**Consultant Insurance requirements**

The Consultant shall not commence work until all required insurance coverage has been obtained and such insurance has been reviewed and accepted by the District. Certificates of Insurances on the current ACORD form shall be issued to the District showing all required insurance coverage.

Insurance Required	Limit Required
Automobile Liability insurance covering Any Auto	\$1,000,000 Combined Single Limit
Comprehensive (Commercial) General Liability insurance including Products, Completed Operations, Independent Contractors, Broad Form Property Damage, Pollution and Blanket Contractual Liability coverage. Any XCU exclusions to be removed when underground work is performed.	\$1,000,000 Occurrence \$2,000,000 Aggregate \$1,000,000 Personal Injury \$ 500,000 Fire Damage \$ 5,000 Medical Payments  Per Project Aggregate  Evidence of coverage must be shown on certificates of insurance.
Professional Errors & Omissions Liability insurance required for all licensed or certified professionals, (e.g., all architects, and engineers)	\$1,000,000 Per Claim/Occurrence \$1,000,000 Aggregate \$5,000,000 maximum limit  Retroactive Date preceding date of contract must be shown in the Comments/Remarks Section of ACORD application.  Professional Errors and Omissions Liability Insurance shall be maintained for three (3) years past substantial completion of construction contract. If coverage is cancelled or non-renewed prior to contract completion date, the Consultant shall purchase "Extended Reporting Period" coverage for a three (3) year period.
Workers Compensation insurance with limits to comply with the requirements of the Texas Workers' Compensation Act.  Employers Liability insurance	Statutory Limits  \$1,000,000



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<b>Umbrella or Excess Liability</b>	\$1,000,000
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**Insurance Conditions**

All insurance coverage shall be issued on an Occurrence form (except Professional Liability insurance, which may be issued on a "Claims Made" form) by companies acceptable to District and licensed to do business in the State of Texas by the Texas Department of Insurance. Such companies shall have a Best's Key rating of at least "A- X".

**All certificates must include:**

1. A 30 day notice of cancellation of any non-renewal, cancellation to any of the policies, and copies of CG 02 05, TE 02 02A and WC 42 06 01 or their equivalents specifically naming the District;
2. "Additional Insured" on the Property, General Liability and Automobile Liability and policies naming the District.
3. A "Waiver of Subrogation" clause in favor of the District will be attached to the Workers Compensation, General Liability, and Automobile Liability.

In addition to certificates of insurance, copies of policy endorsements must be provided (a) listing the District as Additional Insured CG 20 10, CG 20 37, CA 04 03, and (b) showing waivers of subrogation in favor of the District: CG 24 04, TE 20 46A, WC 42 03 04A, or their equivalents

Consultant shall be responsible for payment of all deductibles.

If any policy has aggregate limits, a statement of claims against the aggregate limits is required.

The District reserves the right to review the insurance requirements during the effective period of any contract to make reasonable adjustments to insurance coverage and limits when deemed reasonably prudent by District based upon changes in statutory laws, court decisions or potential increase in exposure to loss.

## **Contractor Requirements**

### **Insurance and Bonds**

[The following information shall be included in the general conditions of all project manuals.]

CONTRACTOR shall not commence work until all required bonds and insurance coverages have been obtained and such insurance has been reviewed and accepted by the OWNER. Certificates of Insurance on the current ACORD form shall be issued to the OWNER showing all required insurance coverages.

**Insurance Required**

**Limit Required**



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<b>Automobile Liability</b> insurance covering Any Auto	\$1,000,000 Combined Single Limit
<b>Comprehensive (Commercial) General Liability</b> insurance including Products, Completed Operations, Independent CONTRACTORS, Broad Form Property Damage, Pollution and Blanket Contractual Liability coverages. XCU exclusions to be removed when underground work is performed.	\$1,000,000 Aggregate, Occurrence and Personal Injury \$ 500,000 Fire Damage \$ 5,000 Medical Payments  Per project aggregate. Evidence of coverage must be shown on certificates of insurance.
<b>Workers Compensation</b> insurance with limits to comply with the requirements of the Texas Workers' Compensation Act	Statutory Limits
Employers Liability insurance	\$1,000,000

<b>Umbrella or Excess Liability</b> insurance (Excess of primary General Liability, Automobile Liability and WC Coverage B.)	One times contract amount for all contracts exceeding \$100,000 up to \$25,000,000 total limit
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Limits for primary policies may differ from those shown when Umbrella or Excess Liability insurance is provided.

<b>All Risk Builders Risk Property Insurance</b> shall be required for all construction contracts when property of the OWNER is at risk or in the care, custody and control of the CONTRACTOR. Builders Risk insurance shall be required for all construction contracts requiring a bond. All Property Insurance shall include coverage against the perils of Flood and Earthquake. (Installation Floater may be substituted when contract involves installation only.)	Contract Limit or Replacement Cost Value of Scope of Work whichever is greater  Permission to Occupy granted  <b>Deductible:</b> 1% of contract or \$50,000 maximum, unless otherwise approved by the OWNER.
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**Insurance Conditions**

All insurance coverages shall be issued on an Occurrence basis (except Professional Liability) by companies acceptable to OWNER and licensed to do business in the State of Texas by the Texas Department of Insurance. Such companies shall have a Best's Key rating of at least "A- X".

All certificates must include:

1. The location or description and the bid number, CSP number or Purchase Order number.
2. A 60 day notice of cancellation of any non-renewal, cancellation or material change to any of the policies.
3. "Additional Insured" on the Property, General Liability, Automobile Liability and Umbrella (Excess) Liability policies naming the OWNER.
4. A "Waiver of Subrogation" clause in favor of the OWNER will be attached to the Workers Compensation, General Liability, Automobile Liability, Umbrella Liability and the Property Insurance policies.
5. In addition to certificates of insurance, copies of policy endorsements must be provided (a) listing the OWNER as



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Additional Insured and (b) showing waivers of subrogation in favor of the OWNER: CG2010, CG2037, CG2404, CA0070, CA0032, WC0003 or their equivalents.

All insurance must be maintained for one year following substantial completion with Certificates of Insurance provided.

CONTRACTOR shall be responsible for payment of all deductibles. The OWNER shall approve the deductibles selected.

If any policy has aggregate limits, a statement of claims against the aggregate limits is required.

The OWNER reserves the right to review the insurance requirements during the effective period of any contract to make reasonable adjustments to insurance coverages and limits when deemed reasonably prudent by OWNER based upon changes in statutory laws, court decisions or potential increase in exposure to loss.

Insurance requirements shall be included in all AIA contracts as Exhibit "A".

### Bonds Required

Construction, installation and service contracts (including repair and alteration) valued at over \$25,000 require that 100% Payment Bonds be furnished by the successful bidder (prime CONTRACTOR). Construction, installation and service contracts (including repair and alteration) valued at over \$100,000 require that 100% Performance and Payment Bonds be furnished by the successful bidder (prime CONTRACTOR). All such bids must include a 10% Bid Bond.

The OWNER does not bond SUB or SUB-SUB-CONTRACTORS. Any CONTRACTOR that elects to bond SUB or SUB-SUB-CONTRACTORS will do so at their own expense. The OWNER will notify the CONTRACTOR of any special bonding requirements for SUB or SUB-SUB-CONTRACTORS, if applicable.

Bonds shall be issued by a company authorized to do business in the State of Texas with an A.M. Best Company rating of at least "A- X" and included on the U.S. Department of the Treasury Listing of Approved Sureties (Dept. Circular 570). The CONTRACTOR shall be responsible for obtaining bonds and shall be responsible for the payment of all bonds with reimbursement by OWNER in accordance with contract documents.

### Contracting Requirements

- OWNER will submit all contracts for review by legal counsel and supplementary conditions will be added to the contract in lieu of modifying AIA contract language. The only changes to the original documents should be information to identify the parties and contract conditions.
- ARCHITECTS AND ENGINEERS shall provide a copy or reference to the appropriate AIA contract document in all construction specifications and shall include an actual copy of applicable Supplementary Conditions in the construction specifications.
- Include current **PREVAILING WAGE RATE SCHEDULE** in all construction proposal and contract documents.
- CONTRACTORS will be required to provide full lien releases to receive retainage. Partial lien releases will not be accepted by the OWNER.
- Add paragraph to all contracts detailing CONTRACTOR, SUB CONTRACTOR and SUB-SUB CONTRACTOR allowable mark-up for change proposals.
- Add the following Paragraphs to the Supplementary Conditions modifying AIA Document A201-2007:

Add Paragraph 8.3.4 and 8.3.5 as follows:

#### 8.3 Delays and Extensions of Time

§ 8.3.4 The work to be performed under this Contract shall be substantially completed within ( ) calendar days after the date of notice to proceed or by (insert date) or as stipulated in the Contract Documents, whichever is earlier, or by such dates thereafter as may be established by any written extensions granted under Article 8 of the General Conditions. The parties hereto agree that time is of the essence to this Contract, and



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that the pecuniary damages that would be suffered by the OWNER, if the CONTRACTOR does not substantially complete all work called for in the Contract Documents by the specified date, are of their very nature difficult of ascertainment. It is therefore expressly agreed that as part of the consideration inducing the OWNER to execute this Contract, that the OWNER may deduct from any final payment made to the CONTRACTOR a sum equal to \$ **[INSERT SUBSTANTIAL COMPLETION DAMAGES PER DAY FROM TABLE BELOW]** per day for each and every calendar day beyond the agreed date which the CONTRACTOR shall require for substantial completion of the work included in this Contract. It is also expressly agreed that if the CONTRACTOR does not complete all punch list items within **90** days of submitting the punch list, the OWNER may deduct from any final payment made to the CONTRACTOR an additional sum equal to **\$100.00** per day for each and every calendar day beyond the **90** days given to the CONTRACTOR to complete the punch list items. It is also expressly agreed between the parties that in its sole discretion, the OWNER may contact the CONTRACTOR'S bonding company in the event that the OWNER believes that its rights under the performance bond related to the Project may be invoked. It is further understood that the above-referenced sums per day are agreed upon by the parties as a fair estimate of the pecuniary damages that will be sustained by the OWNER in the event that the work is not substantially completed within the agreed upon time or the punch list is not completed in a timely manner. These sums shall be considered as liquidated damages only, and in no sense shall be considered a penalty, said damage being caused by additional compensation to personnel, loss of interest on money, inconvenience, disruption of the educational environment, moving costs, loss of building use, and other miscellaneous increased costs, all of which are difficult of exact ascertainment.

**REPLACE THE ITEMS IN BRACKETS [ ] ABOVE WITH APPROPRIATE DATA  
DO NOT INCLUDE THE FOLLOWING TABLE IN THE SUPPLEMENTARY CONDITIONS**

Estimated Construction Contract Amount	Substantial Completion Damages per Day
Less than \$5,000,000	\$ 500.00
\$5,000,001 to \$10,000,000	\$ 1,000.00
\$10,000,001 to \$25,000,000	\$ 1,500.00
\$25,000,001 to \$50,000,000	\$ 2,000.00
\$50,000,001 to \$75,000,000	\$ 2,500.00
\$75,000,001 to \$100,000,000	\$ 3,000.00
Over \$100,000,000	\$ 3,500.00

§ 8.3.5 The OWNER'S use of the Substantially Complete facilities shall not be disrupted or prohibited in any way. Failure to complete and close-out the Project within **90** days after the scheduled Substantial Completion date will result in liquidated damages being assessed in the amount of **\$100.00** per day. If the CONTRACTOR is delayed through no fault of the OWNER, and Substantial Completion is not achieved by the agreed contract completion date, the PROJECT close-out period of **90** days will not be extended by the number of days of delay past the actual Substantial Completion date and will remain based upon the agreed contract completion date. The CONTRACTOR will be assessed any liquidated damages amount for each day past such date, and such liquidated damages will be deducted from the final payment to the CONTRACTOR.

Add Paragraph 9.6.8 and 9.6.9 as follows:

**9.6 Progress Payments**

§ 9.6.8 Based upon the applications for payment and supporting documents submitted to the ARCHITECT by the CONTRACTOR and certification of the amount payable by the ARCHITECT, the OWNER shall make progress payments, no more than once per month, on account of the Contract Sum to the CONTRACTOR as provided in the Contract Documents as follows:

- .1 Not later than thirty (30) days following the approval of the Application for Payment for goods or services by the OWNER, ninety-five percent (95%) of the portion of the Contract Sum properly



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allocable to labor, materials, and equipment incorporated in the Work and ninety-five percent (95%) of the portion of the Contract Sum properly allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing (subject to the conditions listed in Article 9.3.2 of the Supplementary Conditions to the Contract for Construction), for the period covered by the Application for Payment, less the aggregate of previous payments made by the OWNER.

- .2 Upon Substantial Completion of the entire Work, a sum sufficient to increase the total payments to ninety-five percent (95%) of the Contract Sum, less such amounts as the ARCHITECT shall determine for all incomplete Work and unsettled claims as provided in the Contract Documents.

§ 9.6.9 If only five percent (5%) retainage is withheld by the OWNER on payments to the CONTRACTOR, then the CONTRACTOR shall withhold only five percent (5%) retainage on payment to SUB-CONTRACTORS; and SUB-CONTRACTORS shall withhold only five percent (5%) retainage on payments to SUB-SUB-CONTRACTORS.

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## DIVISION 01

### GENERAL REQUIREMENTS

- **CONSTRUCTION QUALITY**
  - TEA Chapter 61, Subchapter 61.1036
    - (1) Districts with existing building codes.
      - (A) A school district located in an area that has adopted local construction codes shall comply with those codes (including building, fire, plumbing, mechanical, fuel gas, energy conservation, and electrical codes). The school district is not required to seek additional plan review of school facilities projects other than what is required by the local building authority. If the local building authority does not require a plan review, then a qualified, independent third party, not employed by the design architect or engineer, shall review the plans and specifications for compliance with the requirements of the adopted building code. The plan review shall examine compliance conditions for emergency egress, fire protection, structural integrity, life safety, plumbing, energy conservation, and mechanical and electrical design. The review shall be conducted prior to the commencement of construction and must be conducted by a qualified building code consultant or a third party architect or engineer. A qualified building code consultant is a person who maintains, as a minimum, a current certification from the ICC. Associated fees shall be the responsibility of the school district. The reviewer shall prepare a summary list of any conditions not in conformance with the provisions of the adopted building code and is required to send a copy to the school district, design architect, or engineer. The design architect or engineer shall revise the plans and specifications as necessary and certify code compliance to the district. The reviewer, in his or her reasonable judgment and with the approval of the local building authority, may allow a limited number of variances from the codes if such variances do not negatively affect the quality or safety of the facility. Any disputes shall be a matter for contract resolution.
- **FINDINGS AND DIRECTIONS** – Updated September 2007
  - Provide district-wide wireless access in all learning spaces and offices
  - Provide library accessibility to students and the community after hours
  - Library/media centers to meet or exceed TEA and Southern Association requirements
  - Plan building layouts (spatial configuration, location of fixed spaces such as toilets, stairs, shafts and mechanical/electrical rooms); select partition materials; and mechanical, electrical and plumbing systems to accommodate substantial changes in the future



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- Provide diverse and adequate instructional spaces; some large group space at intermediate and high schools; some divisible small spaces at elementary schools for special education programs and small group instruction
- Plan buildings so that areas such as the library, auditorium, theater, gymnasiums, career and technology and some classrooms may be accessed after hours by students, community college and community uses
- Provide spaces for campus based instructional specialists and professional learning communities staff development for PK-12
- Provide technology storage areas and a technical repair facility for technology
- Provide updated and/or adequate spaces for special programs such as special education, GT, bilingual, etc.
- Provide parent resource centers for PK-12
- Provide a welcome center at all schools
- Provide opportunities for experiencing natural light in common spaces throughout each school

#### Elementary Schools

- Build large classrooms and easily divisible spaces for differentiated instruction
- Design buildings that can accommodate differing instructional organizations
  - Pods (by grade or vertical grouping)
  - Families
  - Self-contained special education classrooms
  - Co-teaching (special education instruction)
  - Professional Learning Community
- Redesign the access and usability of the open mod within the grade level pod and the outdoor classroom
- Plan elementary schools to serve grades PK-5
- Design elementary schools for 850 students
- Build science labs and art rooms with adequate water access, cabinetry for storage of equipment and tile flooring
- Provide a separated area in art rooms for a kiln
- Build a community involvement room/wing with separate access/security so that after school activities can be conducted and community parent groups can meet
  - Parent education
  - ESL classes
  - GED
  - Adult literacy
- Provide a flexible performance and activity space in each elementary school
- Provide classroom space in every grade level to accommodate bilingual classes

#### Intermediate Schools

- Provide spaces to accommodate various electives to support student learning
- Provide a larger space for theater arts classrooms
- Provide additional mini gym facility/multi-purpose facility (noncompetitive)
- Design cafeteria/stage area to become more conducive to performances
- Design intermediate schools for 1200 to 1300 students
- Design schools for grade level houses with space for
  - Language arts
  - Reading
  - Math
  - Science
  - Social studies
  - Supporting areas for special education, counselors, large group/flex area
  - Storage

#### High Schools

- Design or breakdown existing facilities to create schools-within-schools or houses for approximately 600 students each
- Design high schools for 3000 to 3500 students in grades 9-12
- House design to be flexible to work either by grade level, vertical houses, academic strand areas or interdisciplinary teams



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- Each house should have classrooms for English, math, social studies, science and elective offerings
- De-emphasize departmentalization by designing generic classrooms
- Create spaces for support services (administration, counseling, technology) in each house
- Put classes that exhibit hands-on learning along main street (CATE, journalism, graphics, etc.)
- Provide varied size work spaces for students and teachers work
- Provide spaces to accommodate eating, studying and connecting (small learning café)
- Provide varied types and sizes of space to accommodate various teaching/learning modes
- Provide spaces to accommodate various electives to support student learning including black box performance theater and scene shop for theater arts
- Provide a career/college center on each campus
- Provide specialized CATE offerings at target campuses
- Create a newcomer center for multiple cultures/languages

#### Alternative High School

- Design alternative high school for 250 to 300 students
- Design building to accommodate extended hours and evening/night programs

#### Health and Wellness

- Design programs, outdoor spaces/equipment and adequate facilities that teach and promote lifelong health and wellness attitude
- Provide designated classroom space for health, fitness and wellness programs on all campuses

- Unless otherwise specified, all systems and materials furnished shall have a minimum one (1) year parts and labor warranty requiring on-site resolution of issues. No service charges or call out charges are allowed to investigate warranty claims. Specify the previous statement in all contract documents related to warranty.
- In all cases, warranties are to include all parts, freight, labor, refrigerant (if applicable) and travel expenses related to warranty diagnosis and repair.
- Classroom minimum ceiling height is 10 feet unless otherwise approved by the OWNER.
- Technology infrastructure such as cabling, patch panels, data racks, telephone racks, sound racks, punch down boards, etc. to be included in the **Base Proposal**.
- CONTRACTOR shall include mark-up for overhead and profit for all allowances in their **Base Proposal**. No additional mark up, including labor burden, will be allowed on individual items provided under the allowances.
- For change orders outside of allowances noted in the document, the CONTRACTOR will be allowed to add mark up for overhead and profit as stipulated in the contract documents.
- As-built underground site utility drawings must be provided showing specific locations of all known underground utilities. CONTRACTOR shall keep a field copy of the as-built drawings current as the project progresses.
- Design professionals shall schedule a walk through with the OWNER prior to commencing design on all projects involving additions or renovations of facilities and all major MEP projects.
- All MEP site visits will be accompanied by the OWNER'S Engineer.
- The MEP Engineer is responsible for prompt replies to all submittals and RFIs.
- The OWNER'S Engineer shall:
  - Be notified and witness all underground piping and electrical conduit inspections prior to cover-up.
  - Be notified and witness all pressure or leakage tests.
  - Be notified and witness all water pipe flushing and cleaning including the fire sprinkler system.
  - Be notified and witness all MEP wall or ceiling cover-up and final inspections.
- The OWNER'S Engineer will receive an official copy of all inspections and verify that all punch list items on all inspection reports are completed.
- Design professionals must provide for continuation of utility services during all addition and renovation projects. Scheduled utility shut downs must be coordinated with the normal operation of the school facility. Where extended utility shut downs are anticipated, a means must be provided to protect the environmental conditions inside the school facility.
- Upon completion and close out of all projects, the ARCHITECT shall provide the OWNER with a CD ROM containing electronic files of all construction documents including, but not limited to, original plans and specs, construction contract, CPR, AEA, close out documents, as-built drawings, meeting minutes and all other documents related to the project.
- Contract documents shall require the CONTRACTOR to produce electronic as-built drawings in AutoCAD format



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(.DWG) that accurately depict any as-built deviations from the original construction documents.

- All documents in the Close-Out Manual shall be arranged by specification section. This includes CONTRACTOR and SUB-CONTRACTOR releases, hazardous material certifications, warranties, extended warranties, etc. Close-Out Manuals arranged any other way will be rejected and returned to the ARCHITECT and CONTRACTOR.
- Provide one full size additional set of as-built drawings at closeout to be given to the MEP Supervisor to put at the school. Provide for a metal storage cabinet in all new construction projects to store the as-built drawings at the facility.
- The ARCHITECT will have the schematic design reviewed by a consultant certified by Crime Prevention Through Environmental Design Organization. [www.cpted.net](http://www.cpted.net)

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## DIVISION 02

### EXISTING CONDITIONS

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## DIVISION 03

### CONCRETE

- Roof Deck Standards - Reinforcing:  $\frac{3}{4}$ " polypropylene fibers, 2 lbs. per cubic yard at the mixing bin.
- Design mix: Mix Ratio 1:4.5±
- Wet Density As-Cast: 53-63 lbs. per cubic foot, ASTM C-138
- Oven Dry Density: 31-37 lbs. per cubic foot, ASTM C-495
- Compressive Strength: 200 lbs. per cubic foot @ 28 days, ASTM C-495
- Roof Deck Standards - Insulation: EPS approved equivalent to INSULPERM, 1.5 lb. Density, Average R-Value = 20.0
- Acceptable manufacturers:

**CELCORE  
ELASTIZELL  
SIPLAST**

- All light weight roofing standards must be reviewed by the **District Roofing Consultant** prior to releasing for proposal requests. CONTRACTOR shall facilitate a light weight roofing pre-installation meeting that shall include the **District Roofing Consultant**.
- The OWNER requires that four (4) test cylinders be made for each 100 yards of structural concrete placed per day. One (1) cylinder will be tested at 7 days and two (2) tested at 28 days. Test lab is to report failed tests to the OWNER immediately.
- At the request and expense of the CONTRACTOR, the extra cylinder will be tested at 56 days. The CONTRACTOR may request additional cylinders at their expense.

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## DIVISION 04



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#### MASONRY

- Eliminate CMU walls from ceiling to deck unless required for fire rating, sound attenuation or security.
- All restroom walls shall extend to deck; including walls between adjacent restrooms.
- All restroom ceilings to be hard surface instead of lay-in ceiling tile.
- The ARCHITECT is responsible for ensuring the integrity of the moisture barrier on all outside walls. This includes frequent onsite inspections during the installation of waterproofing material and exterior brick to ensure that the membrane is not damaged and that the weep holes are properly located and not filled with mortar.
- Mortar Net or similar product shall be specified on all projects.
- Mock-up panel is required for all masonry designs.
- All brick shall be king size, 1/3 bond. Special shapes required at corners if not 90 degrees. Unless otherwise approved by OWNER.
- All interior CMU to be running bond unless otherwise approved by OWNER.
- All outside corners on CMU to be bull nose. **Field ground bull nose is not acceptable.**
- Provide suitable backer material inside of door frames so that silencers can be securely installed in door frames after grouting. **PLACE A BOLD NOTE ON THE DRAWINGS TO INDICATE THIS AS A MANDATORY OWNER REQUIREMENT.**

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#### DIVISION 05

#### METALS

- Roof Deck: G-90 Galvanized 24 gauge slotted deck welded at every corrugation and every bar joist. Screw side laps 18" on center with **#10 STAINLESS STEEL SELF TAPPING SCREWS**.
- Roof deck material to be 80,000 psi, minimum.
- Weld washers not required on roof deck 22 gauge or thicker.
- Do not allow welds to burn through deck leaving a hole.
- Wire brush and paint or cold galvanize roof deck welds.
- Space welds 6 inches on center in perimeter and corner zones.
- Provide a roof ladder for all changes in roof level.
- All roof deck standards must be reviewed by the **District Roofing Consultant** prior to releasing for proposal requests. CONTRACTOR shall facilitate a roof deck pre-installation meeting that shall include the **District Roofing Consultant**.

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#### DIVISION 06

#### WOOD, PLASTICS AND COMPOSITES

- Cabinet Hardware: Hinges; Institutional Hinge, 100742, Dull Chrome (Cabinetmakers Hardware, 2002, Volume 6B), or approved equivalent. (Hinge count, spacing and layout to be determined as required)
- Drawer slides to be full extension with 100 lb. rating.
- Use a standard casework good quality lock and key on all millwork (will not match classroom door key).
- All casework doors and drawers to be keyed.
- Key all cabinets in each room alike. System must be keyed to a master for all cabinets in each facility.
- All casework must have full wood base of either 3/4" plywood or 2"x 4" frame. (Particleboard, wafer board or legs are not acceptable). This requirement is to be verified on LEED or TX-CHPS projects.
- Under-counter computer keyboard trays shall be custom built by the casework SUB-CONTRACTOR to the

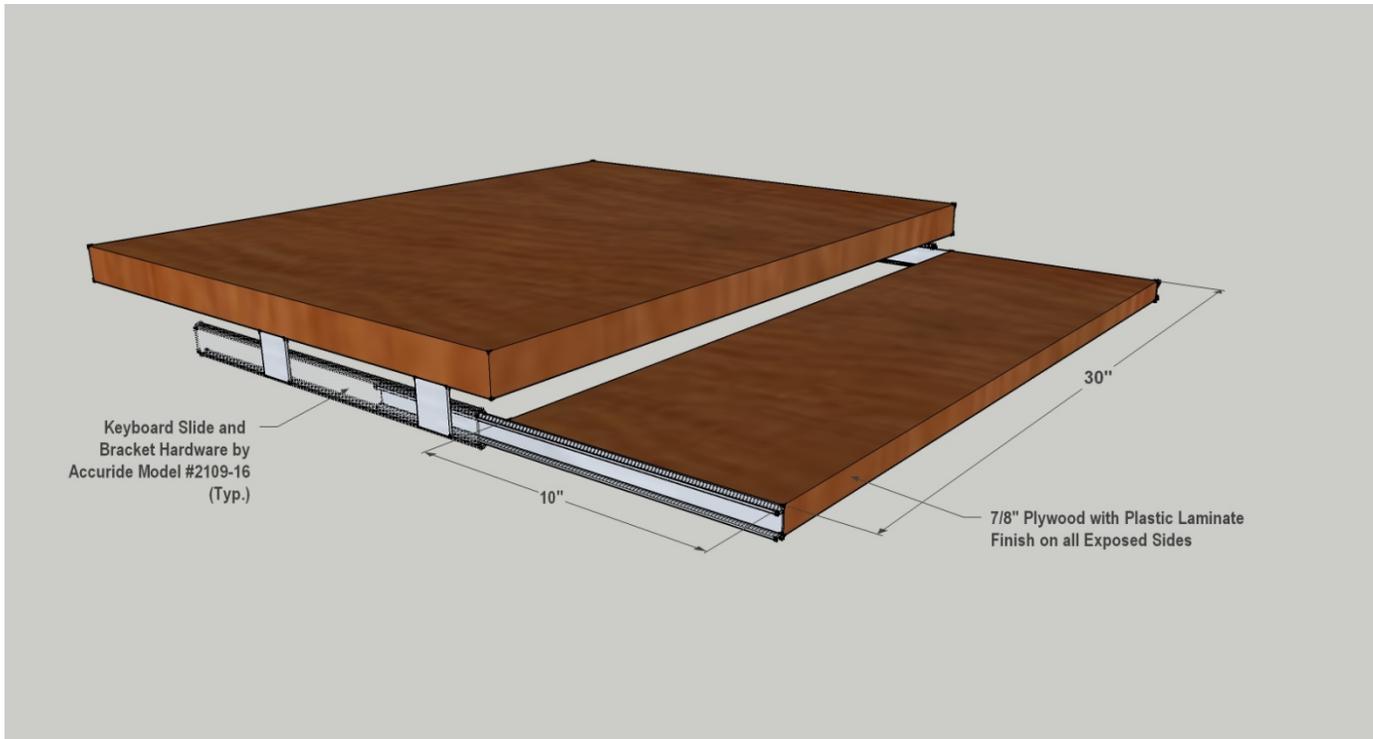


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following specifications:

- Manufacture from 7/8" thick cabinet grade plywood (no particle board)
- Tray to be 10" deep x 30" wide, minimum.
- Trays to be sanded smooth, without sharp corners and covered with laminate on the ends, top and front. Laminate shall match the base cabinet.
- Slides shall be Accuride Model 2109-16 or approved equivalent.
- <http://www.cabinetparts.com/m/accuride/drawer-slides-full-and-partial-extension/AC210916/>





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## DIVISION 07

### THERMAL & MOISTURE PROTECTION

- All roof hatches to be aluminum material. Include a roof hatch in all projects, including single story buildings and additions, unless specifically requested otherwise by OWNER.
- Default color for roof flashing is dark bronze unless otherwise specified by the ARCHITECT.
- Through-wall flashing and receivers to be constructed with 24 gauge stainless steel. Waterproof membrane shall be self-adhered modified membrane (ice and water shield or approved equivalent).
- All thermal and moisture protection standards must be reviewed by the **District Roofing Consultant** prior to releasing for proposal requests. CONTRACTOR shall facilitate a thermal and moisture protection pre-installation meeting that shall include the **District Roofing Consultant**.

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## DIVISION 08

### OPENINGS

- All interior doors to be 7'-0" tall unless otherwise approved by the OWNER. Adjust coursing of masonry if needed to maintain uniform door height.
- Multi-occupant public use restrooms with doors shall have push/pull hardware with an exterior deadbolt lock and interior thumb latch with unlock only function. (IPC 2012 Section 403.3.6)
- Specify heavy duty thresholds at all delivery doors.
- Do not use knock down door frames.
- Provide 3'-6" or 4'-0" doors with level threshold landings in places where large equipment is installed such as in kitchens, industrial tech locations, mechanical rooms, band halls, etc.
- Provide 3'6" door at entrance to all main custodial rooms where an automatic floor machine will be used.
- For entrances, use bronze colored or clear anodized aluminum exterior window and door frames instead of hollow metal; all frames must match in color and must match existing color for renovations.
- Interior door and window frames to be hollow metal painted to match interior color selection.
- All **powered rollup doors or gates** must have the motor and gear mechanism mounted above the ceiling, no exceptions.
- All rollup doors and keyed switches must have a standard keyed lock the same as other doors in the building.

#### ACCESS CONTROL

- A. Please note that Schlage is the Klein ISD district standard for access control. Regardless of what manufacturer is awarded the hardware contract, all doors with access control must have a Von Duprin exit device and the door must be a wide stile design.
- B. Schlage Wireless Access-Harrow, PIM-485-OTD-SMS Panel Interface Module, 16 door capacity and RS485 outputs
- C. Schlage Electronic Security, SIPNX-100, IP Addressable Module, for the GRC2NX, GRCNX-8, GRCNX-16 and GRCNX-IR.
- D. Schlage Electronic Security, SRCNX-16, 16 Reader Controller, 1MB RAM, sixteen contact inputs, two SPDT, 3 amp output relays, four solid state relays.
- E. Schlage Electronic Security, G16H-NX, Panel Power Supply
- F. Locknetics 593 PI-12DC, PIM Power Supply
- G. Exterior Doors, Schlage Wireless Access – Harrow, WA993-PXH, Wireless Exit with HID Reader with Von Duprin Panic Bar, 98/99



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- H. Interior Doors, Schlage Wireless Access – Harrow, WA5696-PXH, WA Series mortise lock with HID proximity reader
- I. Elevators shall have access control

## 08 71 00 – FINISH HARDWARE

### PART 1 - GENERAL

#### 1.01 Description of Work

- A. Work under this section comprises furnishing and installing of door hardware herein and as noted on the drawings for a complete and operational system, including any electrified hardware components, systems and/or controls. Any hardware requirement that is not explicitly set forth, but reasonably required to provide a complete and thoughtful job is to be furnished. Such hardware must be selected from the same manufacturers as used on adjacent and/or similar areas on this project. Added hardware must harmonize with this specification, that is, it shall follow logically the pattern and spirit of the existing work.
- B. Items include but are not limited to the following:
  - 1. Butts and Hinges
  - 2. Flush Bolts
  - 3. Exit Devices
  - 4. Locksets and Cylinders
  - 5. Push Plates – Pulls
  - 6. Coordinators
  - 7. Closers
  - 8. Kick, Mop, and Protection Plates
  - 9. Stops, Wall Bumpers, O.H. Controls
  - 10. Thresholds, Gaskets and Door Bottoms
  - 11. Silencers
  - 12. Miscellaneous Trim and Accessories
  - 13. Labor to install all hardware specified in this division

1.02 Related Documents, Drawings and general provisions of contract, including general and supplementary conditions and Division 1 Specification Sections, apply to this section.

1.03 Related work specified elsewhere that shall be examined for the effect upon this section:

- Section 08 11 13 - Hollow Metal Doors & Frames
- Section 08 14 00 - Wood Doors
- Section 08 80 00 - Entrances and Storefronts

1.04 References specified in this section subject to compliance as directed:

- A. National Fire Protection Association publication # N.F.P.A. – 80 Standard for Fire Doors and Fire Windows [Edition as adopted by the Authority having Jurisdiction]
- B. National Fire Protection Association publication # N.F.P.A. – 101 Life Safety Code [Edition as adopted by the Authority having Jurisdiction]
- C. A.D.A. – The Americans with Disabilities Act – Title III – Public Accommodations [Edition as adopted by the Authority having Jurisdiction]
- D. Texas Accessibility Standards [TAS] Architectural Barriers Act, Article 9102, Texas Civil Statutes.



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E. Local Building Code(s) as adopted by the Authority having Jurisdiction.

1.05 Submittals

A. Hardware Schedules: Submit six (6) copies of the proposed Hardware Schedule to the CONTRACTOR/ARCHITECT.

B. All parties connected with this section shall exercise due diligence with regard to all related shop drawings in order to assure the proper detailing of the construction drawings results in a complete and fully end result.

C. For the purpose of clarity with respect to compliance with the specifications, the Hardware Submittals shall follow the same scheme as the hardware schedule in the specifications and:

1. Hardware Set Numbers or Heading Numbers listed for each opening shall match the number listed in the specification for that opening. Should a Supplier wish to split door out of a specified set then the hardware set prefix numbering shall remain the same with a suffix added to note a change [ e.g. Heading # 9 has variations then all doors under Heading # 9 that are changed shall be identified as Set 9.1, 9.2, 9.3, 9.4 etc, etc].
  2. Hardware Item numbers [ aka "short codes" ] [ e.g. B-1; B-2; etc. etc.] shall be the same as the item numbers used in the specification.
  3. Hardware descriptions shall be included as listed in the specification to assure all involved can read and understand what is being supplied and generally where the item is used. Terms such as "Miscellaneous Hardware" and "Weatherstrip" are too general and are unacceptable.
  4. The product listing sequence of each hardware set shall follow the established industry convention as presented within this hardware specification.
  5. Each submittal shall have an index by door number sequence showing the hardware set of heading Number.
  6. Each submittal shall have a recap sorted by item number or short code [ e.g. B-2; B-2 etc. ,etc.].The Recap shall include the manufacturers name or code, item number, manufacturer's product number, finish and total quantity of each item.
- The schedule shall be in a format listing each door opening, including the handing of the opening, door size, door and frame material and all hardware scheduled for the opening.
  - Include catalog cut sheets and any required special mounting instructions with the hardware schedule.
  - Supply the CONTRACTOR with schedules within two (2) weeks from the date purchase order is received.
  - The Hardware Schedule shall use the room signage numbering system. If the plans are not written with the proper signage numbers, an "as built" hardware schedule will be given to OWNER by the Hardware Supplier using the signage numbers.
  - Certification of compliance: Submit any information necessary to indicate compliance to any or all of these standards as required.
  - CONTRACTOR shall provide written verification that all hardware supplied for this project meets all the requirements of these standards.
  - Submit any samples necessary as required by the ARCHITECT.



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- Once the Hardware Schedule is approved, it is the responsibility of the Hardware Supplier to furnish templates to the General CONTRACTOR for his distribution to his Door and Frame Suppliers. Templates for Finish Hardware items shall be sent within three (3) working days of approved schedule receipt.
- An approved door and frame submittal of each type shall be given to the Hardware Supplier so that the proper hardware may be detailed for the project.
- Closer certification: The CONTRACTOR shall furnish a certificate executed by a representative of the door closer manufacturer that all closers have been inspected, adjusted and are operating as designed and have been installed in accordance with the manufacturer's instructions.
- Furnish an "as built" Hardware Schedule with closeout documents, including keying schedule, manufacturer's installation, adjustment and maintenance information.
- The local hardware supplier will provide a printed index listing as follows:  
key tag # x room signage x key change # x key set symbol x foot note remarks  
OWNER will provide a sample of the format required.

#### 1.06 Delivery, Storage and Handling

##### A. Packaging

1. Furnish all hardware with each unit clearly marked or numbered in accordance with the hardware schedule.
2. Pack each item complete with all necessary parts and fasteners.
3. Properly wrap and cushion each item to prevent scratches during delivery and storage.

- B. Deliveries: Hardware suppliers shall stockpile all items in advance to ensure their availability and make all necessary deliveries in a timely manner to guarantee orderly progress of the total work. Drop shipments from the manufacturer to the job site will not be permitted.

##### C. Storage:

1. CONTRACTOR shall supply a separate secure, dry storage area sufficient in which to store, protect and organize Finish Hardware for this project.
2. Upon delivery all items are to be checked by the CONTRACTOR immediately acknowledging their arrival. Any shortages or discrepancies shall be noted at this time and the supplier notified immediately.
3. Hardware supplier shall assist in setting up job site hardware storage, organizing items so they may be located easily when needed for installation.

#### 1.07 Sequencing and Scheduling

- A. All Door Hardware shall be warranted by the local supplier and made good for a period of one year after the date of substantial completion. Improper installation, abuse, and lack of normal maintenance are not covered by this warranty. The Local Supplier's warranty is not part of the Manufacturer's warranty.
- B. Manufacturer's standard warranties continue in force as per each product specified for this project.

## **Part 2 - Products**

### 2.01 Fasteners



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- A. Furnish all Door Hardware with code compliant screws, bolts and other fasteners as recommended by each manufacturer for a long life under hard use.
- B. Furnish fastenings where necessary with expansion shields, toggle bolts and other anchors designated by the ARCHITECT according to the material to which the hardware is to be applied and the recommendations of the hardware manufacturer.
- C. All closers and exit devices shall be thru-bolted.
- D. All thresholds shall be set in a bed of mastic.
- E. Design of all fastenings shall harmonize with the hardware as to material and finish.

#### 2.02 Environmental Concern for Packaging:

The hardware shipped to the job site shall be packaged in biodegradable packs; such as paper or cardboard boxes and wrapping. If non-biodegradable packaging is utilized, such as plastic, plastic bags, Styrofoam, then the CONTRACTOR shall be responsible for the disposal of the non-biodegradable packing to a licensed or authorized collector for recycling of the non-biodegradable packing.

#### 2.03 Butts and Hinges

- A. Provide Architectural Commercial grade butts and continuous hinges.
- B. Do not specify pivot hinges for any application.
- C. Generally each door leaf shall have three (3) hinges up to 7'6" inches in door height and one (1) additional hinge for every 2'6" inches or fraction thereof.
- D. Unless otherwise specified, provide five-knuckle heavy duty, button tip, full mortise type hinges with non-rising pins.
- E. Provide non-removable pins for out swinging doors at secured areas, exterior doors or as called for in this specification.
- F. Where required to clear trim and/or permit doors to swing 180 degrees, furnish hinges of sufficient throw, height and weight, as per hinge manufacturer's data tables to provide long term durability. Frames with 2" reveals require ball bearing butt hinges size 5.0 x 5.0.
- G. Butt hinged doors having door closers shall have Ball Bearing Hinges.
- H. All butts and hinges shall be selected based upon the manufacturer's published recommendations based upon door size, weight and expected frequency of use.
- I. Finishes:
  - 1. At wood and plastic laminate doors, hinges are to be plated to match adjacent hardware, or they are to be finished as scheduled.
  - 2. At hollow metal doors, hinges are to be US Prime for painting or stainless steel at exterior out swinging doors, unless otherwise specified.
- J. Acceptable Manufacturers (or approved equivalent):
  - Hager



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- Ives
- McKinney
- Stanley

#### 2.04 Locks and Lock Trim

- A. All locksets, latches and trim shall be lever operated mortise type having BHMA/ANSI Certification for Performance Grade 1, Security Grade 2.
- B. All Classroom, office, and ancillary rooms shall have a lock/ unlock indicator on the inside of the room. Verify exact rooms with owner
- C. Lever operated mortise locks to have full escutcheon trim. This trim provides for full door hole coverage if and when lock functions are changed. It also provides for trouble free thumb turn installation and operation.
- D. Provide correct cylinder collar size and type as necessary to avoid "cylinder collar stacking". Also provide straight wall or tapered wall collars as necessary to assure cylinder hole coverage. Do not install tapered wall collars where collar overhangs, and is not flush with other hardware trim.
- E. Provide wrought box strikes and curved lip strikes with proper lip length to protect trim of the frame.
- F. All functions shall be exactly as listed in the individual hardware sets with no exceptions.
- G. All lever trim shall be cast or forged. Wrought levers are not acceptable.
- H. All lever trim is to be thru-bolted through the door and lock case.
- I. All locks shall have factory provided brass construction cores installed when the lock is installed on the door to prevent damage to the cylinder housing caused by lock operation via screw driver or other non-factory tool.
- J. At least 2 cylinder wrenches shall be provided and included with the hardware and shall be used to install interchangeable core mortise cylinders.
- K. Generally, provide life safety lock functions at all doors. Out swing doors at offices, closets, mechanical rooms and storerooms etc., shall have life safety functions with deadbolts to provide better protection than by merely having a latch bolt only.
- L. Finish shall be dull chrome plated brass US 26D [626] or as scheduled.
- M. Acceptable Manufacturers (or approved equivalent):
  - 1. Corbin Russwin                      ML2000 Series    NSM Design
  - 2. Sargent                                8200 Series      LW1L Design
  - 3. Schlage                                L9000 Series    06N Design or OME

#### 2.05 Keying

- A. All cores and keys shall be 7-pin small format interchangeable format.
- B. To ensure the OWNER'S requirements are satisfied, a meeting must be held with the OWNER, ARCHITECT, CONTRACTOR and Hardware Supplier to finalize the keying schedule. Bitings for each project will be furnished to the supplier by the OWNER.



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- C. The keying for any medication storage area or closet in a school clinic, shall be keyed “SKD” as directed by the OWNER.
- D. All elevators, powered rollup doors and gates shall be controlled by the specified key system.
- E. Two (2) change keys having “VKC” shall be supplied for each opening. Where numerous duplicate keyed openings exist this number may be adjusted at the discretion of the OWNER.
- F. Furnish 1 key blank for each lock on the project, round the quantity of key blanks up to the manufacturer’s box quantity [e.g. for a job with 189 locks, provide 200 blanks]. Provide for a minimum of 200 blanks on each new construction project.
- G. Provide 20 uncombined cores per project matching the finish and keyway of the majority of product on the job. Uncombined cores must be capable of being field stamped with VKC **without distorting core face**.
- H. Stamp each core face and key bow with its key set symbol [“Visual Key Control” a.k.a. “VKC”]; omit change key numbers on key bow.
- I. **Brass construction cores** shall be provided and installed by the manufacturer prior to shipping.
- J. The CONTRACTOR shall be required to provide a unit price quote for the credit to be issued for the return of **brass construction cores** at the end of the job. The CONTRACTOR OR SUB CONTRACTOR shall arrange for the cores to be picked up by the Hardware Supplier and the credit shall be issued as a change proposal.
- K. Temporary Construction Trims and Cylinders are specified for Card Key Access Doors. These trims are to be used during construction and then turned over to the owner when Card Key Trims are installed.
- L. Provide 24 construction keys and 6 construction control keys for each project. Verify exact quantity with OWNER.
- M. Permanent Building Grand Master, Master Keys, etc shall be furnished according to the following schedule:
  - 1. Elementary Schools – Fifteen (15 each) Sub-Master Keys and above.
  - 2. Secondary Schools – Twenty Five (25 each) Sub-Master Keys and above.
  - 3. Other non-school facilities (i.e. Administration, Warehouse, Instructional Support Center, etc. – Fifteen (15 each) Sub-Master Keys and above.
- N. All permanent keys, cores, key blanks and uncombined cores shall be sent directly to the CONTRACTOR by the Hardware Supplier. **All cores to be installed as directed by the Owner prior to substantial completion.**
- O. The local hardware supplier will provide a printed index listing as follows:  
  
key tag # x room graphics x key change # x key set symbol x foot note remarks.
- P. Furnish deluxe 2 tag wall mounted key cabinet(s) complete for each new facility having a capacity to match the quantity of door locks on the project plus 50% expansion.
- Q. The General CONTRACTOR shall install the key cabinet(s) as directed by OWNER. The CONTRACTOR or Hardware Supplier shall set-up the cabinet as directed by OWNER.



2.06 Exit Devices

- A. Exit devices shall be ANSI/BHMA Performance Grade 1 and shall be “UL” listed for Life Safety. All exit devices for labeled doors shall have “UL” label for “Fire Exit Hardware”. All devices shall be thru-bolted. All devices shall conform to current N.F.P.A.80 and N.F.P.A.101 requirements.
- B. All exit devices shall be of a heavy duty, chassis mounting design, with one-piece removable covers, eliminating the necessity of removing the device from the door for standard maintenance.
- C. All trim shall be thru-bolted to the lock stile case. All non-fire rated exit devices shall be supplied with cylinder dogging feature.
- D. All lever trim shall have an anti-vandal clutching mechanism.
- E. All exit devices shall be plated to standard Architectural finishes matching the balance of the door hardware.
- F. All removable mullions shall be door key removable.
- G. Provide a mullion holder mounted near all doors with removable mullions to allow for storage of removed mullion.
- H. All exit devices shall be installed using factory supplied sex bolts.
- I. Do not use exit devices with concealed mechanisms [e.g. concealed vertical rods].
- J. Architect shall coordinate the specification and installation of proximity door lock devices with OWNER.
- K. Finish US26D/ US32D or as scheduled.
- L. Acceptable Manufacturers (or approved equivalent):
  - Sargent
  - Von Duprin

2.07 Door Closers

- A. All door closers shall be heavy duty ANSI/BHMA Grade 1, surface mounted, hydraulic type, full rack and pinion construction, fully adjustable spring power, with separate tamper resistant, non-critical, adjustable sweep, latch speed and back check valves.
- B. All door closers shall have a heavy duty cast steel body.
- C. Closers shall have minimum 1.5” diameter pistons to further enhance door control.
- D. All closers shall be the product of a single manufacturer.
- E. All door closers shall be installed using factory supplied sex bolts.
- F. All door closers shall be installed and adjusted by manufacturer trained technicians with experience installing the brand of devices provided.



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- G. Provide door closer mounting accessories as required to facilitate a complete material list, items required, such as drop plates, special arms, spacer blocks, etc., shall be supplied as required by the details shown on the plans and/or door and frame vendors shop drawings.
- H. All door closers shall have a 10 year factory warranty
- I. Acceptable Manufacturers (or approved equivalent):
  - LCN 4041 Series
  - Sargent 281 Series

2.08 Door Stops and Holders

- A. OWNER requires that floor stops be used wherever possible. The CONTRACTOR shall properly reinforce any wall that is to have a wall stop installed.
- B. Some sort of device shall be furnished to stop every door leaf. Every door shall have a floor, wall or overhead stop.
- C. Place door stops in such a position that they permit maximum door swing, but do not present a hazard or obstruction. Furnish floor strikes for door holders of proper height to engage holders of doors.
- D. Where overhead stops or holders are specified, or otherwise required, they shall be heavy duty and of solid brass with no plastic parts and shall be installed with sex bolts.
- E. Code permitting, provide door holders/ hold opens at Cafeteria Doors and Special Ed Doors.
- F. When exterior floor stops are used, provide Heavy Duty "Jail Type" floor stops.
- G. Heavy Duty "Jail Type" floor stops shall be installed using epoxy.
- H. Finish: US 32D or US 26D as called for.
- I. Acceptable Manufacturers (or approved equivalent):
  - Hager
  - Ives
  - Rockwood
  - Trimco
- J. Acceptable Manufacturers of Overhead Holders (or approved equivalent):
  - Glynn-Johnson
  - Rixson
  - Sargent
  - ABH

2.09 Push Plates, Door Pulls and Protection Plates

- A. Push plates shall be 8" x 16" where door conditions allow.
- B. Push plates shall be bronze, brass or brushed stainless steel, minimum .050" thick.



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- C. Kick plates shall be 10" high by 2" less than door width (LDW) as specified. Protection plates shall be (.050 thick) bronze, brass or stainless steel. For doors with louvers or narrow bottom rails, kick plate height shall be 1" less than the dimension shown from the bottom of the door to the bottom of the louver or glass.
- D. All Wood, Plastic Laminate and Hollow Metal doors with exit devices shall be equipped with kick plates.
- E. Traffic doors within the kitchen shall be equipped with Brushed Stainless Steel US32D [632] armor plates 34" high x 2" less door width.
- F. Where required, armor plates, edge guards and other protective hardware shall be supplied in sizes as scheduled in the hardware sets.
- G. Provide rub bars [similar to Rockwood # R115LPB] on doors that can be expected to have regular wheeled traffic.
- H. Finish: brushed stainless steel US 32D [632] or as called for.
- I. Acceptable Manufacturers (or approved equivalent):
  - Hager
  - Ives
  - Rockwood
  - Trimco

#### 2.10 Flush Bolts and Coordinators

- A. Manual flush bolts: Top bolt operator shall be at 72" A.F.F. Bottom bolt operator shall be at 12" A.F.F. under normal conditions.
- B. Constant latching automatic flush bolts are preferred as they are more trouble free.
- C. Frame stop mounted full door width coordinators are the preferred type. Provide closer brackets when and where required sized fitting the frame stop width.
- D. Dust proof strikes shall be provided for all public areas and all fire rated openings having flush bolts.

#### 2.11 Thresholds and Seals

- A. Provide materials as listed in hardware sets.
- B. All thresholds must be crushproof and in accordance with the A.D.A. and A.N.S.I. – A117.1.
- C. All seals shall be crimped into their metal tracks to prevent the seal from "walking" out of position.
- D. All seals shall have attaching screws within reasonable distance [approximately 1"] from the end of each piece to properly secure the product to the door or frame and prevent traffic damage.
- E. Provide rain drips at all exterior doors without a canopy or not recessed.
- F. The finish for all hardware in general shall be Dull Chrome Plated Brass US26D [626] and Brushed Stainless Steel US32D [632] as called for in the hardware sets. Regardless of the finishes specified, verify those finishes to be supplied with the OWNER/ARCHITECT.



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G. Acceptable Manufacturers (or approved equivalent):

- Hager
- National Guard Products
- Pemko
- Reese

2.12 Door Silencers

- A. Furnish door silencers at all openings, door seals permitting. Provide two (2) sets at each pair of doors and minimum three (3) silencers, minimum, for each single door.
- B. Install silencers before filling frames with grout or provide suitable backer material inside of frames so that silencers can be securely installed in door frames after grouting. **PLACE A BOLD NOTE ON THE DRAWINGS TO INDICATE THIS AS A MANDATORY OWNER REQUIREMENT.**

2.13 Owner's Stock

A. At completion of the project, supply to the OWNER the following items:

- One (1) complete bitting list of cut keys
- The local hardware supplier will provide a printed index listing as follows:  
key tag # x room graphics x key change # x key set symbol x foot note remarks.
- OWNER will provide a sample of the format required.
- One (1) set of instruction sheets for each item furnished.
- One (1) each of any non-standard tools required for installation or adjustment of each item furnished.
- The General CONTRACTOR shall turn over to the OWNER any and all left over or unused hardware material. This includes but is not limited to such items as screws, cylinder collars, construction keys, shims, closer brackets, installation aids and wrenches etc.

2.14 Special Notes on Product Substitution

A. Proprietary Products:

1. References to specific proprietary products are used to establish minimum standards of utility and quality. Unless otherwise approved, provide only the specified product.

B. Furnish all other materials, not specifically described, but required for a complete and proper Finish Hardware installation, shall be selected by the CONTRACTOR, subject to the approval of the ARCHITECT and OWNER.

C. The ARCHITECT and OWNER reserve the right to approve all substitutions proposed for the specification. All requests for substitutions shall be made prior to bid by a minimum of ten (10) working days, and shall be in writing hand delivered to the ARCHITECT. **The ARCHITECT must confer with the OWNER prior to any approval of substitutions. The OWNER shall have final approval of any substitution.** Two (2) copies of the manufacturer's brochures and a physical sample of the appropriate design and finish shall accompany all requests.

### **Part 3 - Execution**



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3.01 Installation of Door Hardware

- A. All door hardware standards must be reviewed by the **District Hardware Consultant** prior to releasing for proposal requests. CONTRACTOR shall facilitate a door hardware pre-installation meeting that shall include the **District Hardware Consultant**.
- B. All frames to be filled with grout shall first have a suitable backer material installed so that any and all surface mounted hardware can be attached to the frame without having to drill into grout. Backer material is also needed at frames having only frame silencers to assure that silencers can be securely installed.
- C. Experienced hardware installers only shall install hardware. Install strictly according to the hardware manufacturer's installation instructions.
- D. If a hardware pre-installation meeting has not been scheduled by the CONTRACTOR ask to have one scheduled before starting door and door hardware installation.
- E. Install door closers in such a manner as to allow the doors to open as far as possible based upon the on-site conditions and/or limitations of the closer itself. For example, if a door will door will open 180 degrees based on site conditions use the 180 degree installation set-up for the closer. Install the closer for less than 180 degree swing only in special conditions where the door is restricted from opening 180 degrees due to site conditions or deep reveals. If in doubt ask for directions.
- F. Check hardware against the approved Finish Hardware Schedule upon delivery. Store the hardware to protect against loss and damage.
- G. Hardware shall be completely fitted before final coat of paint or other finish is applied and then removed for the final coat. Mortise and cutting shall be done neatly and evidence of cutting shall be concealed in the finish work. Permanently install the hardware after finishing operations are complete and dry. Protect levers from scratching or other damage, adjust hardware, and turn over to the OWNER, in perfect operating condition.
- H. Tag misc. keys and turn over to the OWNER at the time of acceptance of the project.
- I. Upon completion of the installation, the CONTRACTOR shall as a condition of its acceptance, deliver to the ARCHITECT, a report stating that his inspection was made, that all recommended adjustments have been completed, and that all Door Hardware furnished under this section has been installed and is in optimum working condition.
- J. ADA COMPLIANCE: All hardware shall be "ADA" compliant.
- K. Proper door closer adjustment shall be the responsibility of the CONTRACTOR. Final door closer adjustment cannot be accomplished until all glass is installed and the HVAC system is balanced.
- L. ADA Door Closer Adjustment Procedure:
  - 1. All doors must open to at least 90 degrees.
  - 2. Maximum opening force for interior non-fired rated doors = 5.0 pounds.
  - 3. All fire rated doors shall have the minimum opening force allowable by the appropriate administrative authority, typically the local Fire Marshall. Closing and latching a fire door takes precedence over ADA opening force limits.
  - 4. Exterior doors are recommended to have 8.5 pounds maximum force per ANSI Standard A117.1, but this amount of force has not been shown to be effective and has not been adopted by ADA.



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- M. To properly measure closer force;
1. Open door clear of strike plate.
  2. Set force gauge at 30" from hinge or on centerline of lock trim [whichever is greater].
  3. With force gauge in place, push the door open to 70 degrees, note the force reading for compliance with ADA. [Adjust closer spring power as needed to comply with code.]
  4. Regulate closing time; open door to 70 degrees, release and time closing speed [from 70 degrees to within 3" of the frame]. The minimum time shall be no less than 3 seconds. [Adjust the closer's main (sweep) speed valve to comply with code.]
- N. Sources for gauge to measure door closer force:
- |   |  |   |
|---|--|---|
| Howard Manufacturing Co.<br>5996 South Crocker St.<br>Littleton, Colo. 80120<br>303-794-2510<br>Model 719-40MRP | Hunter Products<br>Bridgewater, N.J.<br>800-524-0692<br>Model FDK 40 | Wagner Instrument<br>Greenwich, Ct.<br>800-345-4188 |
|---|--|---|
- O. Install manual floor holder stops such that the hold open mechanism can be operated without reaching far behind the door.
- P. Secure all door seals by crimping the metal track of the seal media to prevent the seal from "walking" out of position.
- Q. Apply door seal fasteners within 1" of the end of each piece of door seal/weather strip.
- R. Loose screws shall be re-installed with "Loc-Tite"
- S. All attaching screws whose heads [slots] are damaged during installation shall be replaced.
- T. The following table lists general recommendations for the location of Finish Hardware as it is applied to doors on this project. This recommendation is a guideline only and is subject to specific instruction. Coordinate with Manufacturers recommendations, Building Code Requirements and Door and Frame Vendors.

Item Description	Preferred Location
Top Hinge	5" from Top of Door
Bottom Hinge	10" from Bottom of Frame
Center Hinge(s)	Equal space CL to CL of Top & Bottom Hinges
Continuous Hinge	Install top of hinge flush with top of door
Deadbolts	48" CL above Bottom of Frame (maximum allowable)
Exit Devices`	40 to 40 5/16" CL of Strike to Bottom of Frame [see manufacturer's instructions]
Locks	40 5/16" CL of Strike to Bottom of Frame
Push Plate	45" CL to Bottom of Frame
Push Bar	42" CL to Bottom of Frame
Pull	42" CL to Bottom of Frame
Panic Device Pulls	Horizontal center line of pull to match center line of panic bar; center line of pull attaching screws to align with vertical center line of key hole.
Push/Pull Set	42" CL of Pull to Bottom of Frame with Maximum Push Bar Height not to exceed 48" to Bottom of Frame



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- 4.01 Additional Bid Information Required of Hardware Supplier:
- A. Price of Hardware as per plans and specifications.
  - B. Supplier's Sales Policy regarding plan changes, credits, extras, returns and engineering time.
- 5.01 Door Hardware Sets:
- Refer to construction plans and standards.

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## DIVISION 09

### FINISHES

- CONTRACTOR to paint basketball court layout on concrete and asphalt play areas at elementary and intermediate schools. Coordinate with the basket goals as follows:
  - Court lines and half-court lines, 3" wide, white
  - All others, including 3-point line, free throw line and lane, 2" wide minimum, white
- Kitchen floors to be quarry tile; use dark epoxy grout only.
- For Kitchen floors use the following tile and grout (or approved equivalent):
  - **Metropolitan** – Quarry tile: Color No. 507 – Puritan Grey
  - **Dal-Tile** – Quarry tile: Color No. 000 – Grey
  - **Laticrete** – Color No. 22 Walnut: Sanded
- Use epoxy grout for all applications. There is no need to seal epoxy grout.
- All grout lines shall be as narrow as possible.
- Carpeting:
  - **COLLINS & AIKMAN** – Applause III or approved equivalent
  - Roll goods only; no tiles
- Walk Off Mats:
  - **COLLINS & AIKMAN** – Abrasive Action; Charcoal color
  - Roll goods only; no tiles
- Paint SUB-CONTRACTOR or CONTRACTOR shall provide supplemental work lighting at areas being painted. Workers must be able to see clearly in the opinion of the OWNER.
- Color of first finish coat of paint shall be a different shade of color to facilitate inspection of the work.
- Paint Standards: All **Sherwin Williams** products:

Painter's Interior Caulk  
Interior Caulk No. 950A

Type A Finish – Exterior and Exterior Hollow Metal  
Kem Kromik Universal Metal Primer B50 Series  
Industrial Enamel B54 Series

Type B Finish – Interior CMU Block



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PrepRite Block Filler B25W25  
ProClassic WaterBorne Interior Acrylic Semi-Gloss B31 Series

Type B Finish – Interior Gypsum Board  
PrepRite 200 Interior Latex Wall Primer  
ProClassic WaterBorne Interior Acrylic Semi-Gloss B31 Series

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## DIVISION 10

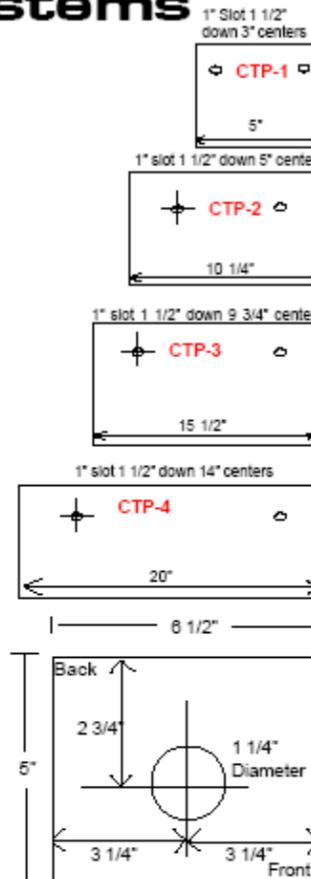
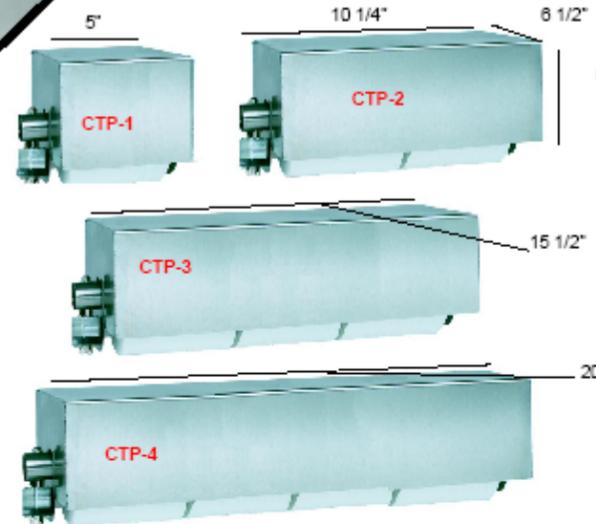
### SPECIALTIES

- Do not use hinged flagpoles.
- Provide solid phenolic core with glue laminate restroom partitions. All partition panels including doors, pilasters, side panels and urinal screens must be minimum  $\frac{3}{4}$ " thick material.
- Available color selection for phenolic partitions shall be based on laminate manufacturers' standard colors and not the standard colors of the phenolic materials.
- All restroom partition hardware shall be heavy duty brushed solid stainless steel.
- Provide heavy duty brushed solid stainless steel slide-type locks on all restroom partition doors.
- Provide continuous heavy duty stainless steel spring return hinges on all restroom partitions.
- Provide double lockers in main custodial room and food service area.
- Hand towel dispensers and soap dispensers will be provided by the OWNER for installation by the CONTRACTOR.
- ALL other toilet room accessories required are to be furnished and installed in the base contract.
- Student restrooms toilet tissue dispenser – **Royce Rolls Ringer Company #CTP-2** - no approved equivalent.
- **Royce Rolls #CTP-2** is only required in student restrooms.
- Do not specify Royce Rolls #CTP-2 in administration, staff or faculty only restrooms.
- One District standard keyed pad lock (Master Lock #510) must be purchased for each Royce Rolls #CTP-2. OWNER will provide keying information for the pad locks.
- Air Circulators – Locker room air circulators shall be wall mounted oscillating design with aluminum propellers and nickel chrome plated wire guard. **Dayton Mfg. Model No. 2WCG3 (30") and 2WCG7 (24")**.
- Air circulators shall be plugged into a wall receptacle near the elevation of the circulator and wall receptacle shall be switched by a wall mounted mechanical 4-hour timer control.
- Coordinate exterior door emergency numbering system with Klein Police department



## Stainless Steel Paper Dispenser Systems

CTP series



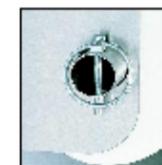
### Covered Toilet Paper Dispensers

	LENGTH	STOCK #
1	Roll 5"	CTP-1
2	Roll 10 1/4"	CTP-2
3	Roll 15 1/2"	CTP-3
4	Roll 20"	CTP-4
	Replacement Tube	TP-TUBE
	Master Lock® #510 (keyed alike)	TP-LOCK
	Snap Ring	TP-CLIP

Stock #TP-TUBE  
 1 1/8" OD stainless steel tube with flared end. 5/8" hole for TP-Lock or TP-Clip.

Durable, sturdy, 18 gauge, type 304 stainless steel frame. 20 gauge, 1 1/8" diameter stainless steel tube fits all rolls. Locks are keyed alike. Anti theft design.

Lock and Clips sold separately



Stock #TP-CLIP



Stock #TP-LOCK (keyed alike) Master Locks®

## ROYCE ROLLS RINGER COMPANY

Grand Rapids, Michigan Since 1925 ALL PRODUCTS GUARANTEED 10 YEARS  
 TOLL FREE 1-800-253-9638 FAX 616-361-5976 www.RoyceRolls.net





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- OWNER shall be consulted as to placement of all restroom dispensers. (Note this requirement on drawings.)
- CONTRACTOR must furnish and install all toilet accessories in the location specified by OWNER or ARCHITECT, regardless of where shown on the drawings.
- Use heavy duty corner guards - 4' high, minimum - in high traffic areas. **Narrow clear plastic corner guards are not acceptable.**
- All Kitchen wall corners that are exposed must be protected with a 2" x 2" (minimum) x 4' high (minimum) angle or break metal stainless steel corner guard.
- Provide and install bracket-mounted fire extinguishers in all mechanical rooms. Do not install recessed fire extinguisher cabinets in mechanical or electrical rooms.
- Provide and install ABC type fire extinguishers in Mechanical Rooms and Front Office.
- Provide and install CO<sub>2</sub> type fire extinguishers in all MDF and IDF rooms.
- Provide and install K-type fire extinguishers in Kitchens.
- Provide 2 flag holders per room.
- Provide 4 map clips per 12' white marker board and one additional map clip for each additional foot of board length (e.g. 16' marker board will have 8 map clips).

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## DIVISION 11

### EQUIPMENT

- Walk-in Cooler/Freezer Doors: Door hardware shall have provisions for locking and interior safety release.
- All custom made stainless steel fabricated sinks and tables shall be made from 14 gauge stainless steel.
- Booster heaters in the Kitchen shall be natural gas operated. OWNER will furnish model numbers.
- Gas appliances must have pilot protection. No standing flame pilots allowed.
- Transition from tile floor to interior of cooler and freezer must be flush; no more than 3/8" offset is acceptable.
- Residential appliances shall be **Kenmore** or approved equivalent. OWNER will furnish model numbers.
- Residential appliances shall be Energy Star rated.
- Approved food service contactors are **Custom Kitchen, Kommercial Kitchens, Kitchen Equipment Fabricating and Texas Metal Equipment** only.

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## DIVISION 12

### FURNISHINGS

- A full mock-up of each finished cabinet style shall be provided for inspection by OWNER before fabrication.
- Millwork drawers must accept letter size hanging folders in the longest dimension, compatible with the Pendaflex Hanging File System, without adding a wire frame, plastic frame or other type hanging rack. Top of drawer sides shall be fitted with a full length molded plastic or metal rail to fit hanging folders.
- Typical dimensions for fitting Pendaflex folders are as follows:
  - Inside width = 12" ±1/8"
  - Inside depth = 9-1/4" minimum to top of folder rail
- Upper wall cabinets and bookshelves must accommodate typical 3-ring binders. Doors must be able to close fully with an 11-1/2" binder in the shelf. Typical usable depth of upper cabinets is 12" minimum.
- Provide round plastic grommet in the countertop at each knee space and at other locations as required. Color to be specified by ARCHITECT.
- Hinges on all cabinet doors must be capable of swinging a full 270 degrees.
- All millwork doors, drawers and other vertical edges must be **edged with 3mm PVC** applied with hot melt adhesive and radiused with automatic trimmers. Hand applied or field applied and trimmed is not acceptable.
- All counter tops must have a 2" radius at exposed corners.
- All laminate countertops containing a sink shall have a **cove backsplash** or shall be manufactured with solid surface material as noted below. A cove backsplash is formed when a continuous sheet of plastic laminate rolls from the countertop deck up the vertical backsplash. This provides a seamless back to the countertop.





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- In all applications where the countertop drops down at a sink, the countertop in the sink area must be manufactured from solid surface material or must have a straight backsplash on three sides surrounding the sink. Approved supplier of solid surface material is **DuPont Corian** or approved equivalent.
- Although **DuPont Corian** does have a molded Corian sink that meets ADA requirements, other available sink options include drop-in/self-rimming or above-the-counter sinks.
- Optionally, provide nominal 1" pressure treated wood-veneer core plywood with .050" plastic laminate at sink cabinets.
- Sides and bottoms of all sink cabinets shall have pressure treated plywood core.
- All exposed vertical surfaces shall be laminated with .030" thick N.E.M.A. approved high-pressure plastic laminate.
- All cabinets to have **heavy-duty** (double magnet) magnetic latches. Roller style latches are not acceptable.
- Provide wall-hung cabinets with finished laminate exterior bottoms matching vertical faces.
- All interior surfaces and door backs shall be laminated with .020" thick high pressure cabinet liner in matt finish. Color to be selected by ARCHITECT. **Melamine type liner is not an approved equivalent.**
- All cabinet bases shall be constructed of preservative treated 2x solid lumber. No particle board or fiber board shall be located within 4" of floor level.
- ARCHITECT shall specify at least two manufacturers of casework acceptable to the OWNER and shall not approve product substitution without prior written approval from the OWNER.
- ARCHITECT shall specify a mock-up of selected casework and require the general CONTRACTOR to supply it for approval by the ARCHITECT and OWNER.
- Casework is not allowed on the site until the building is completely dried in and the humidity is controlled less than 60% and the temperature is controlled between 65 and 80 °F. The entire HVAC system must be operational before casework is allowed on the site.
- Approved Casework and Millwork Manufacturers (or approved equivalent):
  - **Global Casework**
  - **MGC, Inc.**

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## DIVISION 13

### SPECIAL CONSTRUCTION

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## DIVISION 14

### CONVEYING EQUIPMENT

- No special requirements.

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## DIVISION 21

### FIRE SUPPRESSION

- Fire Suppression System must comply with latest state and local codes.
- All fire sprinkler pipe shall be Schedule 40 Black Steel.
- Fire risers shall be single-piece construction with no joints under the building slab.
- Sprinkler heads shall be concealed in areas with ceilings. Flexible heads are allowed in accessible ceilings. Heads in hard ceilings shall be rigid.
- Provide guards for sprinkler heads in gymnasiums, coolers, freezers, and under stairwells.
- Dry-type sprinklers shall be used in all coolers and freezers.
- All systems must be designed, installed, cleaned and tested in accordance with NFPA 13 and NFPA 25.
- The OWNER's Engineer shall:
  - Be notified and witness all flushing, cleaning and testing of the fire sprinkler system.

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**DIVISION 22**

**PLUMBING**

The design team shall obtain a flow test for any new or renovated buildings with a new or modified fire or domestic water service.

**List of Acceptable Plumbing Equipment Manufacturers:**

<b>EQUIPMENT/FIXTURES</b>	<b>MANUFACTURER</b>
Domestic Gas Water Heaters	PVI, A.O. Smith, Lochinvar
Domestic Electric Water Heaters	A.O. Smith, Rheem, State
Electric Drinking Fountains	Halsey Taylor or Elkay only
Manual Flush Valves	SLOAN or ZURN only
Faucets	Chicago only
China	American Standard, Kohler, Toto, Zurn
Carriers	Wade, Zurn, J.R. Smith, Josam, Watts
Stops	McGuire, Kohler, Chicago, Zurn
Water Closet Seats	Beneke, Church, Olsonite, Bemis, Centoco
Floor Drains and Cleanouts	Wade, JR Smith, Josam, Zurn
Shower Systems	Acorn, Bradley
Shower Valves	Chicago, Acorn, Bradley
Sinks	Elkay, Just, Amteko
Hand Wash Stations	Sloan, Bradley
Mop Sinks	Fiat, Stern Williams, Acorn
Roof Drains	Wade, JR Smith, Josam, Zurn, Watts
Thermostatic Mixing Valves	Symmons, Powers, Lawler
Emergency Equipment	Haws, Bradley
Backflow Preventers	Fabco, Wilkins, Beeco, Apollo
Hose Bibbs	Chicago 952

**NOTES:**

- Verify acceptable manufacturers for all Division 22 equipment with OWNER before releasing construction documents.
- Engineers are not allowed to approve product substitutions without OWNER'S written approval.

Acceptable Chicago faucets are shown on the pages following this section. All faucets to be chrome plated model.

**WARRANTIES:** All normal and extended warranties shall include parts, labor, miscellaneous materials, travel time, incidental expenses, normal freight/shipping, refrigerant, oils, lubricants, belts, filters and any expenses related to service calls required to diagnose and correct warranty problems.

School district maintenance personnel are to be present to observe plumbing underground, top out and gas test inspections (It is mandatory that district maintenance personnel witness tests while being performed).

- Domestic water boilers must meet current low NOx standards.
- CONTRACTOR must provide applicable State of Texas boiler inspections and certificate prior to substantial completion where applicable.
- In elementary schools, provide two (2) quick recovery natural gas domestic water heaters (PVI or OWNER approved equivalent). 199,000 BTU maximum.
- All water heaters are to be natural gas fueled whenever possible.
- Electric water heaters, if provided, shall be controlled by the BAS.
- All valves are to be quarter-turn ball valves with bronze body and full port stainless steel ball. DO NOT USE GATE VALVES.
- Main water supply shut off valves to all buildings to be located inside the building.
- Provide a separate cooling tower water supply to be routed to a separate meter by CIVIL to avoid sanitary sewer charges.
- Provide check valves on all hot and cold water supplies to thermostatic mixing valves.
- Provide shut off valves on water lines feeding exterior hose bibs.
- Provide shut off valves on all branch lines feeding fixtures and on all main lines every 100' or less. Shut off valves must be located in an accessible area of ceiling and not in a two-story volume or above hard ceilings.



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- All shut off valves are to be conveniently located within 10' of the floor. Provide shut off valves in the corridor ceiling on water lines to isolate all restrooms. Every restroom shall have a separate shut off valve on each floor of the building regardless of piping layout.
- Provide a shut off valve on all piping branches off the main within 5 feet of the main and preferably in a corridor.
- Provide a potable water hose bib at remote areas of athletic fields.
- All exterior water supplies (hose bibs or faucets) shall have vandal protection.
- Provide anti-syphon devices on all hose bibs and exterior faucets.
- Use only Type L copper pipe for domestic water lines. (No Type M allowed)
- Type K Copper shall be used for below slab domestic water piping and shall be sleeved.
- Press-connect crimp fittings are approved for use on all ½" through 4" copper pipe.
- Approved Copper Press Connect Systems:
  - Viega ProPress with Smart Connect feature
  - Nibco Press System (2" and smaller)
- Fittings used must be crimped on either side of the O-ring seal. Single crimp fittings are specifically not approved.
- Solder is an acceptable means to join copper pipe on new construction projects. Renovations shall be press fittings only.
- All copper pipe connections are to be made with individual wrought copper fittings and not drilled and brazed. "Tee-drilling" is not allowed even though it may be code approved.
- Isolate copper lines from all steel. OWNER prefers copper plated clevis hangers such as Cooper B-Line Dura-Copper Clevis hanger with plastic coating. **Cooper B-Line Part No. B3104CTC or approved equivalent.**
- Provide protective sleeves wherever copper pipes of any type penetrate CMU walls.
- All insulated piping shall have appropriate length and thickness galvanized metal shields (saddles) at all hanger points with a stainless steel band around the saddle on each side of the hanger. The shield shall wrap 180 degrees around the lower ½ of the pipe.
- All piping 2" and larger with fiberglass insulation shall have appropriate length and thickness high density foam glass inserts at hanger points. The insert shall wrap 180 degrees around the lower ½ of the pipe and extend 1" past the metal shield on each end.
- Provide hot water in Kitchens, teacher's lounge, mop sinks, custodial sinks, administration break room, clinic, special needs sinks, art rooms and science room teacher stations. **DO NOT PROVIDE HOT WATER IN STUDENT RESTROOMS.**
- Provide hands free hand wash sinks in the Kitchen with 120 VAC power supplies.
- All sensor faucets shall be hard-wired.
- Electric drinking fountains shall not need power to supply water. Do not use factory supplied plastic strainers. Drinking fountains shall be all stainless steel construction.
- Provide bottle-fillers at electric drinking fountains as directed by owner. Do not provide filters for bottle fillers.
- Provide floor drains under all drinking fountains.
- Provide emergency shower stations with floor drains in Intermediate and High School Science Labs.
- Provide utilities for washer/dryer in custodial break rooms (all-electric appliances, hot and cold water and dryer vent). **DO NOT USE FLEXIBLE DRYER VENT. USE RIGID DUCT TO VENT DRYERS.** All dryer vents must be vented to outside the building.
- Specify height of water and drain recessed valve box for washer at 36" to 42" AFF or per code.
- Specify recessed valve box for all applications where a refrigerator with ice maker is installed or planned for the future. Valve box must be large enough to house any backflow preventer and filter that may be required.
- Provide backflow preventers on all faucets at custodial sinks.
- Provide check valves on all hot and cold water supplies to mixing valves to prevent backflow of hot water into the cold water system.
- Provide a hose bib in all mechanical rooms.
- Sewer lines are to be set in 6 inches of bank sand on top and bottom inside the building slab perimeter.
- Sewer lines are to be set in 6 inches of cement stabilized sand on top and bottom outside the building slab perimeter.
- Provide a clean out every 75'. Provide carpet markers for all floor cleanouts.
- Install PVC under the slab for all sewer and grease trap lines (no cast iron). Transition to cast iron above the slab for all drains and vents. No PVC above slab, no exceptions. Specify proper cast iron support at slab transition.
- Do not run grease trap sewer line into building under slab.
- Pump out grease trap immediately prior to substantial completion.
- Provide plaster traps at all sinks in Art Rooms. Specify Zurn 1183-F with disposable filter bags.
- Install double clean-outs at grease traps and concrete them in at grade level.
- Grease traps to have a test well installed outside the trap.
- Install double clean-outs outside building for disposal sewer line & pour concrete pad around them at grade level.
- Provide clean outs for all sinks and toilets. Where multiple sinks and toilets are located, install one clean-out for all sinks and toilets. Clean out must be located on the main line drop and not a branch. Cleanouts must be located above the flood rim of the fixture.
- All clean outs inside the building are to be installed in Men's or Boy's restrooms. Do not install clean outs in the Women's or Girl's restrooms whenever possible.
- All roof drains to be tested by filling with water to the roof level. Test to be witnessed by OWNER'S Engineer.
- Provide a floor drain in all rooms with a water supply and drain. All floor drains to be properly recessed to facilitate proper drainage. Contractor to facilitate an owner-witness demonstration of all floor drains prior to substantial



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completion.

- Gas piping is to be welded if it is 2-1/2" or larger, both inside and outside the building.
- Use welded black steel pipe for above ground gas piping.
- Paint all metal exterior and interior exposed gas piping yellow.
- Underground gas-pipe must be yellow poly pipe with coated steel risers. Provide a tracer wire.
- All gas piping shall be installed such that gas testing can be accomplished without testing through a regulator. Appropriate isolation valves and test tees shall be required to isolate all gas regulators on both sides.
- Provide a manual shutoff ball valve on the appliance gas supply line in addition to the Kitchen Ansul unit automatic shut off.
- Specify a gas valve manifold to isolate Kitchen gas appliances individually at one location. See attached reference sketch in this document after plumbing faucets and confirm design with OWNER.
- Provide separate gas valves on each fixture in labs.
- Provide solenoid valve boxes for science lab utility control. With an EPO button at the teacher's work station.
- Acid waste piping shall be plenum rated CPVC.
- Do not specify hand wash basins (e.g. Bradley); use individual hand wash sinks unless otherwise approved by the OWNER.
- Provide urinals with a strainer type drain such as **KOHLER** K-4960-ET Bardon or approved equivalent.
- ALL faucets to be specified with ceramic cartridge if available and shall be chrome plated.
- Elementary student restroom sinks to be wall mounted with a single **CHICAGO** metering type faucet for cold only. No substitutions.
- Install a gooseneck kitchen type faucet with spray hose in the Teachers' Lounge sink. Spray hose attachments shall not be provided at break room sinks.
- No goose neck faucets are to be installed in student restrooms.
- All lavatories shall be mounted with carriers.
- All toilet seats shall be **BLACK** in color, if available based on design. Check hinges shall be stainless steel.
- All sanitary rough-ins for water closets shall be a minimum of 12" from the rear wall.



**MVP FAUCETS**

**857-E12-665PSHCP**

Manual and Metering Faucets



Product Type

Deck Mounted 4" Fixed Centers Hot and Cold Water Mixing  
Metering Sink Faucet

Features & Specifications

- 4" Fixed Centers
- 2.2 GPM (8.3 L/min) Aerator
- 1 3/4" Vandal Proof MVP Metering Push Handle
- MVP Metering Adjustable Cycle Time Closure Cartridge
- 1/2" NPSM Supply Inlets and Coupling Nut for 3/8" or 1/2" Flexible Riser
- 4" Center to Center Deck Cover Plate
- 4 1/8" Center to Center Integral Cast Brass Spout
- CFNow! Item Ships in 5 Days

Performance Specification

- Rated Operating Pressure: 20-125 PSI
- Rated Operating Temperature: 40-140°F

Warranty

- Lifetime Limited Faucet Warranty
- 5-Year Limited Cartridge Warranty
- 1-Year Limited Finish Warranty

Codes & Standards

- ASME A112.18.1/CSA B125.1
- ADA ANSI/ICC A117.1

Job Name \_\_\_\_\_

Item Number \_\_\_\_\_

Section/Tag \_\_\_\_\_

Model Specified \_\_\_\_\_

Architect \_\_\_\_\_

Engineer \_\_\_\_\_

Contractor \_\_\_\_\_

Submitted as Shown     Submitted with Variations

Date \_\_\_\_\_



2100 South Clearwater Drive  
Des Plaines, IL  
P: 847/803-5000  
F: 847/803-5454  
Technical: 800/TEC-TRUE  
www.chicagofaucets.com

Last Revision: 07/25/2011 • Date Printed: 11/13/2012 • Product specifications subject to change without notice

**Hand Wash Lavatory Metering Faucet**  
**857-E12-665PSHCP**



**KLEIN INDEPENDENT SCHOOL DISTRICT**  
**FACILITY AND SCHOOL SERVICES DEPARTMENT**

**STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES**

**MECHANICAL FAUCETS**

**802-V317XKCP**



**Manual and Metering Faucets**

**Product Type**

Deck Mounted 4" Fixed Centers Hot and Cold Water Sink Faucet

**Features & Specifications**

- 4" Fixed Centers
- 2.2 GPM (8.3 L/min) Vandal Proof Aerator
- 4" Vandal Proof Wristblade Handle
- Ceramic 1/4 Turn Operating Cartridge
- 1/2" NPSM Supply Inlets and Coupling Nut for 3/8" or 1/2" Flexible Riser
- 4" Center to Center Integral Cast Brass Spout

**Performance Specification**

- Rated Operating Pressure: 20-125 PSI
- Rated Operating Temperature: 40-140°F

**Warranty**

- Lifetime Limited Faucet Warranty
- 5-Year Limited Cartridge Warranty
- 1-Year Limited Finish Warranty

**Codes & Standards**

- ASME A112.18.1/CSA B125.1
- Certified to NSF/ANSI 61, Section 9 by CSA
- ADA ANSI/ICC A117.1

Job Name \_\_\_\_\_

Item Number \_\_\_\_\_

Section/Tag \_\_\_\_\_

Model Specified \_\_\_\_\_

Architect \_\_\_\_\_

Engineer \_\_\_\_\_

Contractor \_\_\_\_\_

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 P: 847/803-5000  
 F: 847/803-5454  
 Technical: 800/TEC-TRUE  
 www.chicagofaucets.com

**Hand Wash Lavatory Faucet**  
**802-V317XKCP**



**KLEIN INDEPENDENT SCHOOL DISTRICT  
FACILITY AND SCHOOL SERVICES DEPARTMENT**

**STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES**

**MECHANICAL FAUCETS**

**201-A317XKCP**



**Manual and Metering Faucets**

**Product Type**

Deck Mounted 8" Fixed Centers Concealed Hot and Cold Water Sink Faucet

**Features & Specifications**

- 8" Fixed Centers
- 9 1/2" L Type Swing Spout
- 2.2 GPM (8.3 L/min) Aerator
- 4" Wristblade Handle
- Ceramic 1/4 Turn Operating Cartridge
- 1/2" NPSM Supply Inlets and Coupling Nut for 3/8" or 1/2" Flexible Riser

**Performance Specification**

- Rated Operating Pressure: 20-125 PSI
- Rated Operating Temperature: 40-140°F

**Warranty**

- Lifetime Limited Faucet Warranty
- 5-Year Limited Cartridge Warranty
- 1-Year Limited Finish Warranty

**Codes & Standards**

- ASME A112.18.1/CSA B125.1
- Certified to NSF/ANSI 61, Section 9 by CSA
- ADA ANSI/ICC A117.1

Job Name \_\_\_\_\_

Item Number \_\_\_\_\_

Section/Tag \_\_\_\_\_

Model Specified \_\_\_\_\_

Architect \_\_\_\_\_

Engineer \_\_\_\_\_

Contractor \_\_\_\_\_

Submitted as Shown     Submitted with Variations

Date \_\_\_\_\_



2100 South Clearwater Drive  
Des Plaines, IL  
P: 847/803-5000  
F: 847/803-5454  
Technical: 800/TEC-TRUE  
www.chicagofaucets.com

Last Revision: 07/25/2011 • Date Printed: 11/13/2012 • Product specifications subject to change without notice

**Faucet for Faculty/Staff Lounge Area Kitchen Sink**  
**201-A317XKCP**



**KLEIN INDEPENDENT SCHOOL DISTRICT  
FACILITY AND SCHOOL SERVICES DEPARTMENT**

**STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES**

**MECHANICAL FAUCETS**

**895-317XKCP**



**Manual and Metering Faucets**

Product Type

Deck Mounted 4" Fixed Centers Hot and Cold Water Sink Faucet

Features & Specifications

- 4" Fixed Centers
- 3 1/2" Rigid / Swing Gooseneck Spout
- 2.2 GPM (8.3 L/min) Aerator
- 4" Wristblade Handle
- Ceramic 1/4 Turn Operating Cartridge
- 1/2" NPSM Supply Inlets and Coupling Nut for 3/8" or 1/2" Flexible Riser
- CFNow! Item Ships in 5 Days

Performance Specification

- Rated Operating Pressure: 20-125 PSI
- Rated Operating Temperature: 40-140°F

Warranty

- Lifetime Limited Faucet Warranty
- 5-Year Limited Cartridge Warranty
- 1-Year Limited Finish Warranty

Codes & Standards

- ASME A112.18.1/CSA B125.1
- Certified to NSF/ANSI 61, Section 9 by CSA
- ADA ANSI/ICC A117.1

Job Name \_\_\_\_\_

Item Number \_\_\_\_\_

Section/Tag \_\_\_\_\_

Model Specified \_\_\_\_\_

Architect \_\_\_\_\_

Engineer \_\_\_\_\_

Contractor \_\_\_\_\_

Submitted as Shown       Submitted with Variations

Date \_\_\_\_\_



Last Revision: 07/25/2011 • Date Printed: 11/13/2012 • Product specifications subject to change without notice

2100 South Clearwater Drive  
Des Plaines, IL  
P: 847/803-5000  
F: 847/803-5454  
Technical: 800/TEC-TRUE  
www.chicagofaucets.com

**Clinic Sink Faucet**  
**895-317XKCP**



**KLEIN INDEPENDENT SCHOOL DISTRICT  
FACILITY AND SCHOOL SERVICES DEPARTMENT**

**STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES**

**MECHANICAL FAUCETS  
540-LD897SWXFKCP**



**Manual and Metering Faucets**

**Product Type**

Wall Mounted 8" Fixed Centers Hot and Cold Water Sink Faucet

**Features & Specifications**

- 8" Fixed Centers
- 5 3/4" Rigid Vacuum Breaker Spout with 3/4" Male Hose Thread and Pail Hook
- 2 3/8" Lever Handle
- Ceramic 1/4 Turn Operating Cartridge
- Straight 2" Inlet Supply Arm with Wall Flange with 1/2" NPT Female Thread Inlet
- Atmospheric Vacuum Breaker, Not Intended for Continuous Pressure Applications
- Atmospheric Vacuum Breaker, Not Intended for Continuous Pressure Applications

**Performance Specification**

- Rated Operating Pressure: 20-125 PSI
- Rated Operating Temperature: 40-140°F

**Warranty**

- Lifetime Limited Faucet Warranty
- 5-Year Limited Cartridge Warranty
- 1-Year Limited Finish Warranty

**Codes & Standards**

- ASME A112.18.1/CSA B125.1
- ADA ANSI/ICC A117.1

Job Name \_\_\_\_\_

Item Number \_\_\_\_\_

Section/Tag \_\_\_\_\_

Model Specified \_\_\_\_\_

Architect \_\_\_\_\_

Engineer \_\_\_\_\_

Contractor \_\_\_\_\_

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Date \_\_\_\_\_



Last Revision: 10/19/2011 • Date Printed: 11/13/2012 • Product specifications subject to change without notice

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Des Plaines, IL  
P: 847/803-5000  
F: 847/803-5454  
Technical: 800/TEC-TRUE  
www.chicagofaucets.com

**Mop Sink Faucet  
540-LD897SWXFKCP**



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**FACILITY AND SCHOOL SERVICES DEPARTMENT**

**STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES**

**MECHANICAL FAUCETS**

**928-VR317XKCP**



**Water Faucets**

**Product Type**

Deck Mounted Single Hole Vandal Proof Single Inlet Cold Water Faucet with Vacuum Breaker

**Features & Specifications**

- Single Hole
- 6" Rigid / Swing Gooseneck Spout with Atmospheric Vacuum Breaker
- Full Flow Nozzle
- 4" Vandal Proof Wristblade Handle
- Ceramic 1/4 Turn Operating Cartridge
- 1/2" NPSM Supply Inlets and Coupling Nut for 3/8" or 1/2" Flexible Riser
- Atmospheric Vacuum Breaker, Not Intended for Continuous Pressure Applications
- All Threaded Connections Factory Assembled
- Anti-Rotational Body Deck Pin to Prevent Turning
- Atmospheric Vacuum Breaker, Not Intended for Continuous Pressure Applications

**Performance Specification**

- Rated Operating Pressure: 20-125 PSI
- Rated Operating Temperature: 40-140°F

**Warranty**

- Lifetime Limited Faucet Warranty
- 5-Year Limited Cartridge Warranty
- 1-Year Limited Finish Warranty

**Codes & Standards**

- ASME A112.18.1/CSA B125.1
- ADA ANSI/ICC A117.1

Job Name \_\_\_\_\_

Item Number \_\_\_\_\_

Section/Tag \_\_\_\_\_

Model Specified \_\_\_\_\_

Architect \_\_\_\_\_

Engineer \_\_\_\_\_

Contractor \_\_\_\_\_

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Date \_\_\_\_\_



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2100 South Clearwater Drive  
 Des Plaines, IL  
 P: 847/803-5000  
 F: 847/803-5454  
 Technical: 800/TEC-TRUE  
 www.chicagofaucets.com

**Science Faucet for Cold Only**  
**928-VR317XKCP**



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**FACILITY AND SCHOOL SERVICES DEPARTMENT**

**STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES**

**MECHANICAL FAUCETS**

**930-VR317XKCP**



**Water Faucets**

Product Type

Deck Mounted Single Hole Vandal Proof Hot and Cold Water Mixing Faucet

Features & Specifications

- Single Hole
- 6" Rigid / Swing Gooseneck Spout with Atmospheric Vacuum Breaker
- Full Flow Nozzle
- 4" Vandal Proof Wristblade Handle
- Ceramic 1/4 Turn Operating Cartridge
- 3/8" O.D. Copper Supply Tubes
- Atmospheric Vacuum Breaker, Not Intended for Continuous Pressure Applications
- All Threaded Connections Factory Assembled
- Anti-Rotational Body Deck Pin to Prevent Turning
- Atmospheric Vacuum Breaker, Not Intended for Continuous Pressure Applications

Warranty

- Lifetime Limited Faucet Warranty
- 5-Year Limited Cartridge Warranty
- 1-Year Limited Finish Warranty

Codes & Standards

- ASME A112.18.1/CSA B125.1
- Certified to NSF/ANSI 61, Section 9 by CSA
- ADA ANSI/ICC A117.1

Job Name \_\_\_\_\_

Item Number \_\_\_\_\_

Section/Tag \_\_\_\_\_

Model Specified \_\_\_\_\_

Architect \_\_\_\_\_

Engineer \_\_\_\_\_

Contractor \_\_\_\_\_

Submitted as Shown       Submitted with Variations

Date \_\_\_\_\_



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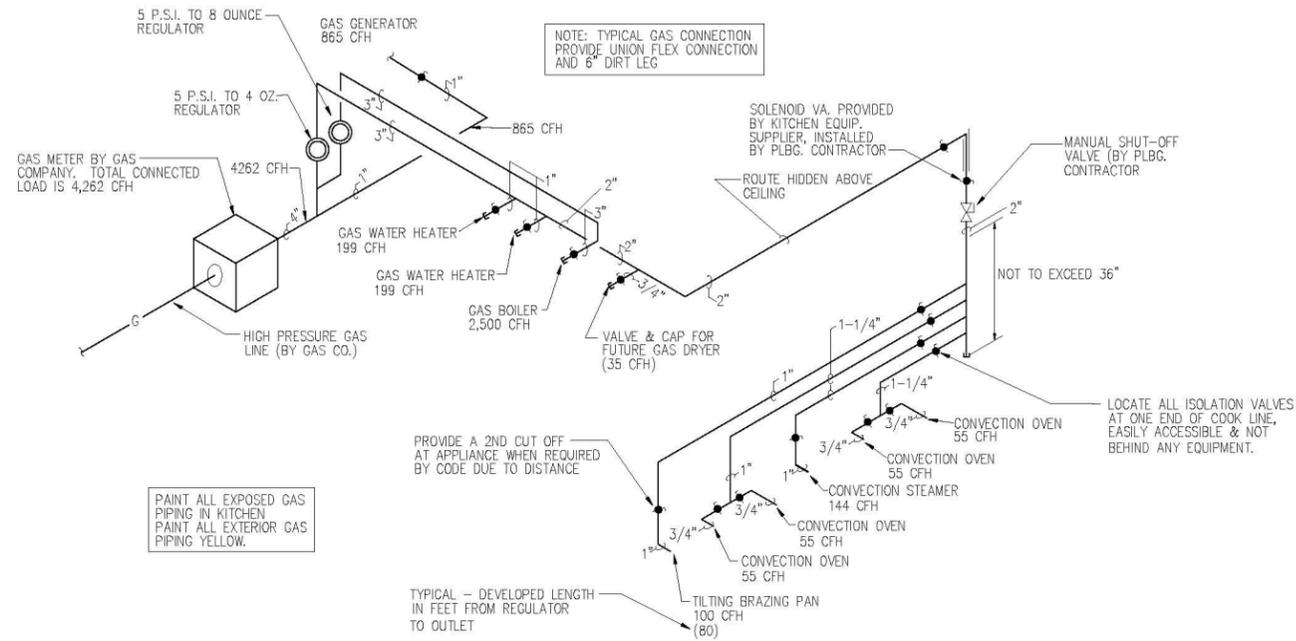
2100 South Clearwater Drive  
 Des Plaines, IL  
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 F: 847/803-5454  
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 www.chicagofaucets.com

**Science Faucet for Cold and Hot**  
**930-VR317XKCP**



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**STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES**



**2 GAS RISER DIAGRAM**  
SCALE: NTS

**Kitchen Gas Piping Riser Example**  
Modify for Specific Project Requirements



**KLEIN INDEPENDENT SCHOOL DISTRICT  
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**STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES**

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**DIVISION 23**

**HEATING, VENTILATION AND AIR CONDITIONING**

**List of Acceptable HVAC Equipment Manufacturers:**

<b>EQUIPMENT</b>	<b>MANUFACTURER</b>
Air-Cooled Scroll Chillers (100 ton capacity or less)	Carrier, Daikin or Trane (Must be Manufactured in the United States)
Air-Cooled Screw Chillers	Carrier, Daikin, Trane or JCI
Water-Cooled Screw Chillers	Carrier, Daikin, Trane or JCI
Water-Cooled Centrifugal Chillers	Carrier, Trane or York
Frictionless (Mag-bearing) Centrifugal Chillers	Daikin, Trane or York
Cooling Towers (Stainless Steel)	BAC, Evapco or Marley
Energy Recovery Units	Trane, Daikin (Core), RenewAire, or Venmar
Variable Frequency Drives	ABB, Danfoss or Yaskawa
Air Handling Units	Carrier, Custom Air Products, Daikin, Temtrol, Trane or JCI
Packaged Rooftop Units	Carrier, Daikin, Trane, JCI
Packaged Outside Air Units	Air2O (Munters), Aaon, Trane
Terminal Devices	Krueger, Price or Titus
Condensing Boilers	RBI, Hydrotherm (KN) or Patterson Kelly (Sonic), Fulton
Non-Condensing Boilers	RBI (Futura), Fulton or Patterson Kelly (Modu-fire)
HVAC Pumps	Armstrong, Aurora, Bell & Gossett, Grundfos or Patterson

**NOTES:**

- **Verify acceptable manufacturers for all Division 23 equipment with OWNER before releasing construction documents.**
- **Engineers are not allowed to approve product substitutions without OWNER'S written approval.**

**Approved Chiller Applications:**

Elementary Schools ..... Air-Cooled Screw with VFD  
 Elementary Schools (Alternative).... Water-Cooled Frictionless Centrifugal with VFD  
 Intermediate Schools ..... Water-Cooled Centrifugal with VFD  
 Intermediate Schools (Alternative). Water-Cooled Frictionless Centrifugal with VFD  
 High Schools ..... Water-Cooled Centrifugal with VFD  
 High Schools (Alternative)..... Water-Cooled Frictionless Centrifugal with VFD

**NOTE: Consult with OWNER for special applications or to deviate from chillers specified above.**

**WARRANTIES: All normal and extended warranties shall include parts, labor, miscellaneous materials, travel time, incidental expenses, normal freight/shipping, refrigerant, oils, lubricants, belts, filters and any expenses related to service calls required to diagnose and correct warranty problems.**

- Each facility shall have two (2) chillers, minimum sized at 60% of the building load. Where three (3) chillers are provided, each chiller shall be sized for 40% of the total building load.
- **Provide alternate bids for each chiller manufacturer. There are no chillers included in the base bid.**



**KLEIN INDEPENDENT SCHOOL DISTRICT  
FACILITY AND SCHOOL SERVICES DEPARTMENT**

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- Chiller specifications shall include minimum IPLV (or NPLV) chiller efficiency. Do not specify full load chiller efficiency as design criteria. Specify full load kW/ton for electrical design requirements only. All chillers must qualify for SCORE program.
- All water-cooled chiller specifications must include a factory performance test. Performance test points must include 100%, 75%, 50% and 25% load values for IPLV as specified by ARI 550.
- All chillers and VFDs shall be provided with native BACNet interfaces and be capable of transferring data to and from the OWNER'S building automation system (BAS).
- Primary/Secondary pumping is the preferred overall central plant design scheme. .
- Specify all chillers with refrigerant isolation valves on each circuit.
- Air-cooled chillers and condensing units must include a full guard package with hail guards on the coils and vandal resistant guards around the base of the chiller.
- All condenser coils shall be epoxy coated.
- Mechanical design must conform to the **International Energy Code**.
- Engineers should design systems appropriate for the hot and humid climate in the Houston area. Systems shall be designed to maximize humidity control.
- Provide energy recovery ventilators or outside air pre-treatment units whenever possible.
- Please note that the OWNER contracts directly with Test and Balance and Commissioning Consultants. There is no allowance in the bids for Test and Balance or Commissioning. **Include TAB specifications in the construction documents with a note that the TAB consultant will be selected by the OWNER and paid directly by the OWNER.** Engineer shall coordinate with owner's commissioning agent for documentation to be included in the project.
- Equipment Extended Warranties (from date of substantial completion):
  - Provide a ten (10) year manufacturer's parts warranty for frictionless centrifugal chiller compressors.
  - Provide a five (5) year manufacturer's parts and labor warranty for all chillers.
  - Provide a five (5) year manufacturer's parts and labor warranty for all components of the cooling tower drive system including the motor
  - Provide a three (3) year manufacturer's parts and labor warranty for all VFDs
- In all cases, warranties are to include all parts, freight, labor, refrigerant and travel expenses related to warranty diagnosis and repair.
- There shall be no cost to the OWNER, under any circumstances, for a CONTRACTOR, SUB-CONTRACTOR, SUB SUB-CONTRACTOR, Distributor, Dealer, Manufacturer, Wholesaler, etc. to investigate a warranty claim.
- All motors shall be NEMA Design B, Class F, TEFC premium efficiency.
- All motors controlled by VFDs shall be NEMA MG-1 Section 31 Inverter-Fed Rated.
- Provide VFDs on all motors 5 horsepower or larger where applicable.
- All VFDs must have a bypass to operate the motor in case of drive failure.
- All loose VFDs shall be installed indoors. Provide NEMA 12 enclosures in central plants and boiler rooms. Provide NEMA 1 enclosures in air handler rooms.
- Cooling Tower Specific Design Information
  - Shall be gear driven with VFDs on the fan motors.
  - Shall be all 304 or 316 stainless steel design.
  - Shall be designed and piped in such a manner that they can be used interchangeably with any combination of chillers. Do not design towers for operation with a specific chiller only.
  - Shall be designed and piped with the bypass returning directly to the cold (lower) basin.
- All belt-driven air handling equipment shall have two drive belts on all motors.
- Direct drive fans are acceptable. Avoid ECM and fan arrays. Motor selection shall be made to minimize sound transmission.
- Insulation on all **chilled** water piping shall be closed-cell foam with waterproof sealant. No fiberglass insulation allowed except on hot water piping.
- Install VAV boxes in the center of corridors and ensure access panels are not blocked. Access for servicing must be provided.
- All ductwork must be externally lined, except for the first 15 feet from AHU may be internally lined with access door for cleaning. Return air boots through mechanical room walls shall be internally lined.
- Kitchen duct shall be externally lined only. Do not specify any section of ducts that supply kitchens with internally lined ducts.
- Do not specify gate valves on any chilled or hot water piping.
- All chilled and hot water piping shall be supported from the structure with trapeze hangers, clevis hangers or on pipe support stands.
- All insulated piping shall have appropriate length and thickness galvanized metal shields (saddles) at all hanger points with a stainless steel band around the saddle on each side of the hanger. The shield shall wrap 180 degrees around the lower ½ of the pipe.
- All piping 2" and larger with fiberglass insulation shall have appropriate length and thickness high density foam glass inserts at hanger points. The insert shall wrap 180 degrees around the lower ½ of the pipe and extend 1" past the metal shield on each end.
- DO NOT allow mechanical CONTRACTORS to weld pipe hangers or support devices directly to the pipe.
- Specify a 4-pipe HVAC system for all facilities. DO NOT USE ELECTRIC HEATERS IN ANY DESIGN UNLESS APPROVED BY OWNER IN ADVANCE.
- Hydronic water boilers must meet current low NOx standards.
- CONTRACTOR must provide applicable State of Texas boiler inspections and certificate prior to substantial completion.
- All piping in the central plant and cooling tower piping shall be painted with appropriate color specified below. Insulated pipe will have the insulation jacket painted and non-insulated pipe shall be properly prepared and painted.

HVAC SYSTEM	SHERWIN WILLIAMS COLOR NUMBER	SHERWIN WILLIAMS COLOR NAME
Chilled Water from Chiller	SW-4056 (Dark Blue)	Blueprint
Chilled Water to Chiller	SW-4054 (Light Blue)	Basin



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Hot Water from Boiler	SW-6871 (Dark Red)	Positive Red
Hot Water to Boiler	SW-6858 (Light Red)	Zany Pink
Condenser Water from Tower	SW-4070 (Light Green)	Generator Green
Condenser Water to Tower	SW-4071 (Dark Green)	Rain Forest
Natural Gas Piping	SW-4084 (Safety Yellow)	Safety Yellow

- All hydronic hot water piping in the central plant shall be painted for 12 inches, minimum, from all terminations at boilers, pumps, valves, flanges, etc. before water is allowed to circulate through the piping. Paint shall be rust inhibiting or galvanizing type.
- Provide carbon monoxide monitors in all boiler rooms.
- Review low-load requirements with the owner to determine if separate cooling means are required for any building areas. All air handling equipment shall meet the latest IAQ standards. Example: Sloped stainless steel drain pans, access doors for cleaning and metal covered interior insulation.
- All AHUs and RTUs to be specified with double-walled construction with metal interior.
- All equipment shall be installed for serviceability. Adequate access must be provided for all doors on AHUs, RTUs, ERVs, etc. Show all clearance requirements on the contract documents for coordination.
- Specify metal filter frames on all air handling equipment. OWNER uses bulk filter media and requires filter frames in all air handling equipment. Filter media shall be minimum MERV 11.
- Specify angled filters on all AHUs.
- Provide stainless steel headers on all air handling units.
- Do not install sight glasses on piping loops outdoors.
- Clinics shall be on a separate zone and maintain negative pressure with respect to all adjacent spaces.
- On new construction projects, the general CONTRACTOR shall provide monthly water treatment services by district chemical treatment vendor for a period of one year after substantial completion.
- **All chilled and hot water systems shall be flushed using external pumps and filters. All equipment and coils shall be bypassed during the system flush. SYSTEMS SHALL NOT BE STARTED UP UNTIL THE PIPING HAS BEEN CLEANED.**
- CLEANING OF HYDRONIC AND CHILLED WATER PIPING SYSTEMS:
  - a) General cleaning of piping systems. Purge pipe of construction debris and contamination before placing the systems in service. Provide and install temporary connections as required to clean, purge and circulate. Flush the chilled and hot water systems utilizing the filter feeders.
  - b) Install temporary strainers at the inlet of pumps and other equipment as necessary where permanent strainers are not indicated. Keep strainers in service until the equipment has been tested, then remove either entire strainer or straining element only. Fit strainers with a line size blow down ball valve and pipe to nearest drain. Blow down strainers, remove and clean as frequently as necessary.
  - c) Phase One: Initial flushing of system. Remove loose dirt, mill scale, weld heads, rust and other deleterious substances without damage to system components. Open valves, drains, vents and strainers at all system levels during flushing procedures. Flush until "potable water clear" and particles larger than 5 microns are removed.
  - d) Connect dead-end supply and return headers, even if not shown on the drawings, and provide terminal drains in bottom of pipe end caps or blind flanges.
  - e) Dispose of water in approved manner.
  - f) Phase Two: Cleaning of Piping Systems. Remove, without chemical or mechanical damage to any system component, adherent dirt (organic soil), oil, grease, (hydrocarbons), welding and soldering flux, mill varnish, piping components, rust (iron oxide) and other deleterious substances not removed by initial flushing. Chemical shall be approved equivalent to **Nalco 2578** prepping compound. Insert anti-foam compound as necessary. Circulate for 48 hours or as recommended by the manufacture. Dispose of water in approved manner. Flush system and replace with clean water. Verify compatibility of chemicals used with existing chemical treatment program on remodel projects.
  - g) Phase Three: Final flushing and rinsing until "potable water clear" and particles larger than 5 microns are removed. Operate valves to dislodge and debris in valve body. Dispose of water in approved manner.
  - h) Submit status report upon completion of each phase of work on each system.
  - i) Special requirements, if any, are specified in the sections on each type of piping or in the section on Water Treatment Systems.

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**DIVISION 25**

**INTEGRATED AUTOMATION**

**BAS Controls (BACNet)**

**List of Acceptable Building Automation System Equipment Manufacturers:**

EQUIPMENT	MANUFACTURER
BAS Controls	Alerton/Tridium by OpenTech
BAS Controls	Automated Logic by ALC – Houston
BAS Controls	Reliable by Unify Energy Solutions
Standard Control Valves	Belimo, Bray, Griswold, Honeywell or



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	Siemens
PICCV Control Valves	Belimo or Griswold

**NOTES:**

- Verify acceptable manufacturers for all Division 25 equipment with OWNER before releasing construction documents.
- Engineers are not allowed to approve product substitutions without OWNER'S written approval.

**WARRANTIES:** All normal and extended warranties shall include parts, labor, miscellaneous materials, travel time, incidental expenses, normal freight/shipping, refrigerant, oils, lubricants, belts, filters and any expenses related to service calls required to diagnose and correct warranty problems.

- **Building Automation Systems (BAS) shall be specified and bid as Division 25 directly to the General Contractor.**
- **Provide alternate bids for each BAS controls vendor. There are no BAS controls included in the base bid.**
- Building Automation System (BAS) controls shall be native BACNet, in compliance with ASHRAE Standard 135-2004 and addenda, latest edition, for control systems. Proprietary control systems or software are not acceptable.
- Specify all BAS controls with a 2-year all inclusive labor and materials warranty from the date of substantial completion.
- Control vendors must guarantee interoperability with future installations of their own manufacturer's equipment and with equipment of other BACNet compliant manufacturers for the life of any new or upgraded control systems installed.
- Control vendors must guarantee that they will provide labor and materials at a cost to the OWNER to assist future control vendors in attaining interoperability on future additions and renovations.
- User access to the BAS must be compatible with an iPad browser. Following is a list of minimum functionality that must be provided on an iPad interface.
  - Alarm Display
  - Point Commanding
  - Graphic Display
  - Scheduling
  - Running Reports
  - Point Details
- OWNER will specify on each project if a BAS operator interface computer is to be provided. Otherwise, do not specify that a user interface computer is to be provided.
- Control vendor shall update all BAS computers at the OWNER'S office with the latest version of software available from the manufacturer for each project completed.
- BAS system shall be web browser based (Internet Explorer or approved equivalent open architecture) and shall provide the capability of full operator interface via the Internet from any computer with a connection to the Internet. Security shall be provided via an unlimited number of administrator defined user names and passwords.
- All features, functions, graphics, capabilities, scheduling, etc. shall be accessible through the web interface.
- **Any BAS control vendor supplying controls on any OWNER new construction project must provide a new or updated user interface that is web browser based, as described above.**
- All control system user interfaces must be fully functional without restrictions or limitations such as limited time of use, requirement for a key, dongle or other use restricting device.
- Control vendor shall provide a web based graphical user interface for every project that represents the latest capability of the manufacturer's software.
- Control system shall provide live "thermographics" (a real-time color representation of the temperature, alarm status and occupied status in each zone).
- Graphical user interface must provide the capability to pick a room number (or closest zone control) and allow the operator to navigate to the cooling or heating source serving that room or zone and continue to navigate all the way to the central plant.
- All HVAC equipment must be accessible to the BAS operator for manual start/stop and other control features.
- Provide separate humidity control devices in the band equipment storage areas, learning resource centers (library) and anywhere else that the engineers feel is appropriate. Humidity control is a very important concern.
- Direct digital controls (all electric) shall be provided for all HVAC systems to the zone level using adjustable enhanced thermostats in every zone.
- Thermostats shall have manual temperature slide adjustment and manual override capability. Both features are programmable and controlled by the BAS computer. Digital display on thermostats is not required.
- Pneumatic controls are not allowed on any new control installation. Retrofit and renovation designs shall require the conversion of all pneumatic devices to electric.
- Provide electric control actuators on all VAV air dampers.
- Provide only aluminum bronze discs on all butterfly or disc valves. Undercut discs are acceptable depending on the application.
- Characterized Control Valves (CCV) and Pressure Independent Characterized Control Valves (PICCV) are acceptable for use on HVAC controls; however, they must be specified with adequate flow range to allow for variations between actual field conditions and theoretical calculations.
- Provide electric control actuators on all chilled and hydronic water valves.
- All interior and exterior lights to be controlled by BAS. Include point(s) on points list.
- All exterior lights shall have an astronomical calculation of sunrise and sunset included that prevents the lights from being on during daylight hours even if they are scheduled on.
- Provide a manual override button for all lighting zones.
- Outside air dampers shall be motorized and be on a separate time schedule from the AHUs. Must be a discrete schedule point.
- DO NOT provide temperature sensors or control points for the Kitchen freezer and cooler. KISD has a separate system to monitor those systems.
- On facility additions, renovations and control upgrades, all existing exhaust and supply fans must be interlocked with AHUs or controlled by BAS individually.
- Control system cabinets must be new and must be appropriately sized based on the equipment installed in each cabinet. Reuse of existing control cabinets is not allowed on any type project.
- All control wiring must be in D-Rings or approved equivalent hangers. **No wiring is to be attached to the building structure with tie-wraps.**
- Provide a minimum 8-1/2" x 11" laminated control wiring diagram and control sequence in each control cabinet for all points terminated in that cabinet. Diagrams shall be permanently mounted flip chart style with holes punched at the



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top of each bundle. If two-sided, the back of the sheets must be oriented legible when flipped up. Non-laminated papers inside plastic sleeves are not acceptable. Control CONTRACTOR should consult with OWNER for a detailed description of this requirement.

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**DIVISION 26**

**ELECTRICAL**

**List of Acceptable Electrical Equipment Manufacturers:**

EQUIPMENT	MANUFACTURER
Panels and Switch Gear	Cutler Hammer, General Electric, or Square D, or Siemens
Ultra Efficient Transformers	PowerSmiths, Mirus, or Power Quality International PowerSmiths E-Saver OPAL, Mirus ULLTRA, or PQI EYe-Rated series
LED Drivers	Philips, Osram Optotronic, or Eldo LED. Drivers must be readily available.
Exterior LED Light Fixtures	Acuity, Eaton, Hubbell, LSI, Cree, Visionaire, Signify, or GE Current
Lighting Controls	Lutron ONLY
Emergency Generators	Cummins, Caterpillar, Kohler, <del>Onan</del>
Surge Protection Devices	Current Technology, ACT Communications

**NOTES:**

- Verify acceptable manufacturers for all Division 26 equipment with OWNER before releasing construction documents.
- Engineers are not allowed to approve product substitutions without OWNER'S written approval.

**List of Electrical Wiring Jacket Colors:**

WIRING APPLICATION	COLOR
120/208/240 VAC	Black, Red, Blue, Orange (high leg) and White
277/480 VAC	Brown, Purple, Yellow and Gray

All low voltage wiring must be in D-Rings or similar hangers. No wiring is to be attached to the building structure with tie-wraps. Add this requirement to Tech standards

**WARRANTIES:** All normal and extended warranties shall include parts, labor, miscellaneous materials, processing equipment, travel time, incidental expenses, normal freight/shipping, oils, lubricants, belts, filters and any expenses related to service calls required to diagnose and correct warranty problems.

A school district supervisor is to be present to observe all electrical underground cover up inspections.

- Electrical design must conform to *the latest published International Energy Code*.
- Engineer shall specify/design a lighting control system for all exterior and site lighting. All interior lights shall be controlled by occupancy/vacancy sensors.
- Microwave based sensing technologies shall not be used
- Specify that all switchboards shall have factory installed circuit breakers. P
- Provide high quality surge protection devices (SPDs) in all facilities. Provide SPDs on all switchboards, panelboards, emergency power distribution wireways, and motor control centers. SPDs at service entrance shall include selenium components to protect against power swells.
- Provide CNP approved crane truck access for main building services transformer.
- No "BX" cable allowed.
- Steel MC cable may only be used for light fixture whips up to 10 feet in length.



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- Conduit or any wiring etc. shall not be attached to or be located within 4" of the bottom side of the roof deck.
- Line voltage wiring devices shall be gray except receptacles for emergency power shall be red in color. All cover plates shall be stainless steel. Painted cover plates or receptacles are not acceptable. Low voltage lighting control devices shall be white.
- Rooms with operable partitions are to have separate electric lighting control switches and zones for each room.
- Specify a 20 amp 120-Volt electrical receptacle in all corridors every 400' 50-foot maximum minimum on drawings. Corridor receptacle circuits shall not be shared with any other space other than janitor's closets.
- Provide power for battery powered custodial equipment in all janitor's and custodial areas.
- **MULTI DISCIPLIN REQUIREMENT, ADD TO RESPECTIVE STANDARDS SECTION** Provide utilities for residential type washer/electric dryer in the main custodial break room.
- Provide power for electric hand dryers at all restroom locations unless directed otherwise by OWNER. Provide permanent lock-off device at circuit breaker for NEC required appliance safety disconnect switch.
- Specify ultra-efficient minimum k-7 rated three phase transformers to supply all 120/208/240-Volt panels
- Teacher Lounges are to have a minimum of six (6) 20-Amp dedicated circuits.
- Provide a dedicated 20 amp 120V circuit for every (8) duplex receptacles or equivalent.
- Provide a minimum of one 20 amp 120V circuit for each instructional area.
- Provide deep double gang junction boxes for all rough ins for data and AV connections.
- Rough-in for power and data on both sides of room in administrative offices.
- Provide dedicated receptacles for device charging as directed by owner.
- Provide 50A, 250V plug for temporary panel in gymnasiums and cafeterias as directed by owner.
- All data and power outlets to be located at 18 inches AFF unless otherwise specified by the ARCHITECT or technology plans and standards.
- Provide power and data in Textbook Storage Room located near the door.
- Provide electrical power for six (6) portable buildings. Specify a minimum 250 Amp, 480Volt 3 phase 4 wire panel board to be installed on a galvanized SCH 40 steel pipe rack in the area designated on the drawings for future portable buildings. Power is to be provided from an electrical panel inside the building to the distribution panel.
- Provide six (6) 2" underground conduits from the MDF room or nearest IDF room to the back of the building near the area designated for future portable buildings. Stub the conduits up on the back side of the portable building power distribution rack and cap ends. Exact location is to be determined by OWNER.
- Use multiple pole breakers instead of brackets to tie circuits with shared neutrals together.
- Fuses: There shall be a spare fuse box mounted in main mechanical room with 3 spare fuses of each size used on building, if applicable.
- Provide interior building LED fixtures that comply with the Design Lights Consortium (DLC) standards and are DLC or DLC Premium listed as a Qualifying Product at time of proposal submittal date.
- Instructional and office areas shall utilize 2x2 or 2x4 LED Lay-in edge lit or back flat panel / troffer fixtures: Opaque, edge or back lighted, 4000 Kelvin color temperature. 0-10 Vdc dimmable, L70: 60,000 minimum hours.
- Safety chains and wire guards at light fixtures in mechanical and electrical rooms, and high abuse areas. Provide safety chains only for gymnasium fixtures.
- Gymnasium light fixtures, glass or acrylic refractors or lenses, round profile, single point swivel pendant or hook mounting, designed to be vandal proof without the need for wire guards, no wire guards.
  
- Light fixtures located outdoors, in interior unconditioned spaces, and in wet locations shall be of aluminum construction.
- Light fixtures with door frames located in kitchens, food prep areas, toilets, restrooms, locker rooms, dressing rooms, showers, and unconditioned spaces shall have aluminum door frames.
- Provide minimum 5-year warranty for fixture, driver, and light engine. year
- Outdoor pole mounted light fixtures shall include a discrete / replaceable surge suppression device in addition to the surge suppression incorporated in the LED driver.
- Steel parking lot light poles shall have powder coat finish over galvanizing with a minimum 5 year finish warranty.
- Color Rendering Index (CRI):  $\geq 80$  Indoor;  $\geq 65$  Outdoor
- LED Exit Signs: The exit lighting fixtures shall meet the requirements of Federal, State, and Local Codes.
  - a. Gymnasiums, locker rooms, athletic/PE wing and associated corridors, black box theaters, auditorium stages, cafeteriums and kitchens: Vandal resistant, wet location cast aluminum with polycarbonate protective cover exit signs, Lithonia Extreme Series or similar.
  
- Emergency Lighting Units (when applicable): Lead Calcium batteries with self-diagnostics. Provide full light output at 90 minutes of battery operation. LED lamps.
- The manufacturer shall have performed JEDEC (Joint Electron Devices Engineering Council) reliability tests on the LEDs as follows: High Temperature Operating Life (HTOL), Room Temperature Operating Life (RTOL), Low Temperature Operating Life (LTOL), Powered Temperature Cycle (PTMCL), Non-Operating Thermal Shock (TMSK), Mechanical Shock Variable Vibration Frequency, and Solder Heat Resistance (SHR).
  
- LED drivers:
  1. NEMA 410 compliant for in-rush current.
  2. Starting Temperature:  $-40^{\circ}$  F [ $-40^{\circ}$  C].
  3. Input Voltage: 120 to 480 ( $\pm 10\%$ ) V.
  4. Power Supplies: Class I or II output.
  5. Surge Protection: The system must survive 250 repetitive strikes of "C Low" (C Low:  $6kV/1.2 \times 50 \mu s$ ,  $10kA/8 \times 20 \mu s$ ) waveforms at 1-minute intervals with less than 10% degradation in clamping voltage. "C Low" waveforms are as defined in IEEE/ASNI C62.41.2-2002, Scenario 1 Location Category C.
  6. Power Factor (PF):  $\geq 0.90$ .
  7. Total Harmonic Distortion (THD):  $\leq 20\%$ .
  8. Comply with FCC Title 47 CFR Part 18 Non-consumer RFI/EMI Standards.



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9. Drivers shall be reduction of hazardous substances (ROHS)-compliant.
  10. All drivers must be readily and locally available.
- Light fixture housing for exterior use: Provide aluminum or stainless housing. Where stainless steel hardware is used, both male and female fasteners shall be stainless steel.
  - Emergency LED battery self-testing drivers and inverters; 5-year warranty. Basis of Design:
    1. Bodine BSL-ST Series for OEM installation
    2. Bodine BSL310-SI Series for field installation
    3. Bodine ELI-S Series for line voltage sine wave inverter field installation
  - Emergency Battery Packs – Exit Signs: Nickel Cadmium battery with self- diagnostics; Minimum 3-year non-prorated replacement warranty.
  - Emergency Generator / Inverter Load Control Device (ELC):
    1. 16 Amp minimum ballast / driver load
    2. Compatible with 0-10 Volt dimmer switches
    3. UL 924
    4. Minimum 3-year warranty
    5. Integral or wall-mounted remote test switch.
  - Emergency Generator / Inverter branch circuit transfer switch:
    1. UL 1008
    2. 20 Amp ballast/driver load
    3. 0-10Vdc dimming compatible
  - Do not specify light fixtures with a battery power source for emergency power, except at automatic transfer switch locations. All emergency fixtures to be on the emergency power panel supplied by the emergency generator.
  - Target average illumination light levels for the following spaces shall be as follows, unless noted otherwise in KISD Educational Specifications or the programming criteria. Variations due to fixture spacing and ceiling grid shall be approved by the KISD PM:
    - Classroom 30-45 foot-candle
    - Flex spaces 30-40 foot-candle
    - Science and vocational shops 50-65 foot-candle
    - Library 30-40 foot-candle
    - Offices 40-50 foot-candle
    - Dining and Commons 30-40 foot-candle
    - Corridor / Storage 25-30 foot-candle
  - Provide separate exterior lighting circuit for Kitchen and trash dumpster areas.
  - Provide factory start up services for all emergency generators.
  - Emergency generators shall be load tested at full load for 2 hours. CONTRACTOR must provide a load bank to achieve a minimum load of 90% of the rated generator capacity. During load testing the gas pressure shall be recorded and must remain stable and within manufacturer's acceptable pressure drop range.
  - Emergency generator shall include a **five (5) year parts and labor warranty** for the complete standby electric power system including the transfer switches. Provide separate life safety and standby 4-pole automatic transfer switches.
  - All generator and transfer switch warranty work must be performed by factory certified technicians.
  - The following equipment shall be on an **emergency circuit** with generator backup:
    1. Telecommunications equipment-life safety
    2. Public Address Communication & Master Clock System-life safety
    3. Fire Alarm and Detection System-life safety
    4. Security Systems (except for access control door hardware)-life safety or stand by
    5. Video Surveillance CCTV System including remote camera power supplies-life safety or stand by
    6. Technology/Computer data MDF/IDF equipment-life safety
    7. MDF/IDF dedicated HVAC equipment-life safety
    8. Special needs refrigerators and other selected refrigeration equipment-stand by
    9. Clinic refrigerator and selected clinic receptacles-stand by
    10. Building Access control System including remote power supplies, except do not power door electric strike or hinge hardware on emergency power.-stand by
    11. Radio Base Station / Radio Repeaters / Distributive Antennae System (DAS)-life safety
    12. Elevator-stand by
    13. Point of Sale Stations-stand by
    14. Kitchen Manager's Work Station-stand by
    15. Building Management and Control System (BMCS)-stand by
    16. Special education receptacle (one in each room).-stand by
    17. Offices :At least one light in each administrative office-stand by
    18. Instructional areas At least one light in each instructional area -life safety
    19. Kitchen :All food storage freezers and coolers-stand by



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- 20. Misc :One light-life safety and one receptacle-stand by in each mechanical and electrical room,
- 21. Areas occupied by students without direct administrative supervision: At least one light fixture-life safety.
- 22. The principal's workstation and school secretary's workstation..

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**DIVISION 27**

**COMMUNICATIONS**

**TECHNOLOGY**

**New Campus Infrastructure requirements:**

- (4) cat6 ties from MDF to each IDF, including kitchen wall mount IDF (all pairs terminated)
- Drop(s) for each utility monitoring/management connection (gas, electrical, irrigation, lift station etc.)
- Drops for fire alarm per solution provider requirements to the LEC DMARC (66 block)
- (1) D2 for each Multi function Device (i.e. clinic, registrar, attendance and work rooms)
- (4) 4" (or current district standard) utility entrance conduits with inner duct each with pull cord from public utility easement to the MDF
- ¾" Plywood on MDF walls
- #6 ground wire to building ground on a bus bar for DMARC
- Drop from PA system to MDF Patch Panel for dial tone
- Drop for each elevator back to nearest closest MDF/IDF

**General Infrastructure requirements:**

- Data cabling, terminations, conduit, junction boxes, jacks, racks, ladders and associated equipment are in the **Base Bid**.
- **ANSI/TIA/EIA-568-B is the OWNER standard for telecommunication wiring.**
- **All data cabling shall be terminated using 8P8C modular connectors.** Appropriate matching crimpers shall be used to crimp wires into connectors.
- OWNER requires all **Hubbell** products and a **Hubbell 25-Year Mission Critical warranty** for data infrastructure.
- Provide stainless steel face plates for data and voice. Use **Hubbell SSFxxx Stainless Steel Plates with Xcelerator HXJ6OR** (orange color) jacks for all data applications. Use **HXJ6W** (white color) jacks for all analog or digital voice only applications.
- All data cabling for wireless access points and video surveillance cameras shall be terminated.
- Duplex outlet style plates and frames for data are not acceptable. See cut sheets below for face plate details.
- Data and telephone outlets are to be shown on drawings as triangles with a letter "D" for data and/or "V" for voice with a number corresponding to the quantity of each type of port at each outlet location. Label single ports with a "D1" or "V1" to avoid the appearance of an oversight or lack of information.
- Telephone drops use Category 6 cabling for VoIP, but require white jacks instead of orange to designate voice.
- Verify with OWNER on every project if VoIP phone system is to be used or if digital fiber phone system is required.
- Verify with OWNER the quantity of analog copper phone lines required and the configuration of any punch down blocks for analog copper phone lines.
- OWNER'S written approval is required before specifying any radio, infrared or wireless frequency communication utilizing devices. These devices may interfere with existing technology utilized by OWNER.

DATA RACK CONFIGURATION		
MANUFACTURER	MODEL NUMBER	DESCRIPTION
Hubbell	HPW90RR19	7 ft. floor mounted data rack
Hubbell	UDX48E	Patch panel; quantity as required
Hubbell	VS76H	Cable management, 4 per rack
Hubbell	PR10120	Power management, 1 per rack
Any Mfr.	Any	Cable management ladder rack



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<b>PATCH CORD REQUIREMENTS</b>			
<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>QTY. PER DROP</b>	<b>DESCRIPTION</b>
Hubbell	PCX6Y01	1 (Data)	1 ft. Cat6 Yellow Patch Cord
Hubbell	PCX6Y07	1 (Data)	7 ft. Cat6 Yellow Patch Cord
Hubbell	PCX6B01	1 (AP)	1 ft. Cat6 Blue Patch Cord
Hubbell	PCX6B03	1 (AP)	3 ft. Cat6 Blue Patch Cord
Hubbell	PCX6BK01	1 (Camera)	1 ft. Cat6 Black Patch Cord
Hubbell	PCX6BK10	1 (Camera)	10 ft. Cat6 Black Patch Cord



# KLEIN INDEPENDENT SCHOOL DISTRICT FACILITY AND SCHOOL SERVICES DEPARTMENT

## STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES

### HUBBELL PREMISE WIRING WORK STATION

#### ORDERING INFORMATION

SSF Stainless Steel Plates									
	Single-gang		Double-gang						
	1-port	2-port	3-port	4-port	6-port	4-port	6-port	9-port	12-port
Unit Package	1 per Bag	1 per Bag	1 per Bag	1 per Bag					
Order Qty.	Carton of 25	Carton of 10	Carton of 10	Carton of 10	Carton of 10				
Catalog No.	<b>SSF11</b>	<b>SSF12</b>	<b>SSF13</b>	<b>SSF14</b>	<b>SSF16</b>	<b>SSF204</b>	<b>SSF206</b>	<b>SSF209</b>	<b>SSF212</b>

NOTE: All SSF plates will accept Audio/Video keystone connectors and XCELERATOR™ jacks.

#### SSF Stainless Steel Plate with Label Fields

Order Information						
	Single-gang		Double-gang			
	1-port	2-port	3-port	4-port	6-port	6-port
Unit Package	1 per Bag					
Order Qty.	Carton of 25					
Catalog No.	<b>SSFL11</b>	<b>SSFL12</b>	<b>SSFL13</b>	<b>SSFL14</b>	<b>SSFL16</b>	<b>SSFL16</b>

Face Plates

NOTE: All SSF plates will accept Audio/Video keystone connectors and XCELERATOR™ jacks.

#### ACCESSORIES

##### XCELERATOR™ Jacks, Category 6 and 5e

Category	Catalog No.	Color
Category 5e	<b>HXJ5EXX</b>	Standard Color
Category 6	<b>HXJ6XX</b>	Standard Color

Jacks

Data Color

Voice Color

XX = Color:  
 'AL' = Almond  
 'B' = Blue  
 'BK' = Black  
 'EI' = Electric Ivory  
 'GL25' = Gold\*  
 'GY' = Gray  
 'GN' = Green  
 \* 25-packs only

##### Patch Cords, Category 6 and 5e

Category	Catalog No.	Color
Category 5e	<b>PCX5EXX*</b>	Standard Color
Category 6	<b>PCX6XX**</b>	Standard Color

Patch Cords

Access Points - 1' & 3' Blue

Surveillance Cameras - 1' & 10' Black

Data - 1' & 7' Yellow

XX = Standard Color:  
 'B' = Blue 'BK' = Black  
 'GY' = Gray 'Y' = Yellow  
 For other colors replace color designation with OR - Orange, R - Red, GN - Green, P - Purple  
 \* - Standard Length: '01' - 1', '03' - 3', '05' - 5', '07' - 7', '10' - 10', '15' - 15', '20' - 20', '25' - 25', '30' - 30', '35' - 35', '40' - 40', '45' - 45', '50' - 50', '55' - 55', '60' - 60', '75' - 75', '100' - 100'  
 \*\* - Standard Length: '03' - 3', '06' - 6', '08' - 8', '10' - 10', '12' - 12', '16' - 16', '20' - 20'

##### UTP Cable, SPEEDGAIN® Category 5E, 4-Pair

Color	Catalog No. Riser		Catalog No. Plenum	
	Spool	REELEX*	Spool	REELEX*
Blue	<b>C5EPSRB</b>	<b>C5EPRRB</b>	<b>C5EPSPB</b>	<b>C5EPRPB</b>
Gray	<b>C5EPSRGY</b>	<b>C5EPRRGY</b>	<b>C5EPSPGY</b>	<b>C5EPRPGY</b>
White	<b>C5EPSRW</b>	<b>C5EPRRW</b>	<b>C5EPSPW</b>	<b>C5EPRPW</b>
Yellow	<b>C5EPSRY</b>	<b>C5EPRRY</b>	<b>C5EPSPY</b>	<b>C5EPRPY</b>

\* REELEX is licensed and patented by Windings Inc.

##### UTP Cable, NEXTSPEED® Category 6, 4-Pair

Color	Catalog No. Riser		Catalog No. Plenum	
	Spool	REELEX*	Spool	REELEX*
Blue	<b>C6SRB</b>	<b>C6RRB</b>	<b>C6SPB</b>	<b>C6RPB</b>
Gray	<b>C6SRGY</b>	<b>C6RRGY</b>	<b>C6SPGY</b>	<b>C6RPGY</b>
White	<b>C6SRW</b>	<b>C6RRW</b>	<b>C6SPW</b>	<b>C6RPW</b>
Yellow	<b>C6SRY</b>	<b>C6RRY</b>	<b>C6SPY</b>	<b>C6RPY</b>

\* REELEX is licensed and patented by Windings Inc.

**HUBBELL**®  
**Hubbell Premise Wiring**  
 HUBBELL INCORPORATED (Delaware)  
 14 Lord's Hill Road • Stonington, CT 06378-0901 • (860) 535-8326 • 800-626-0005  
 Fax: (860) 535-8328 • Internet site: <http://www.hubbell-premise.com>

Worldwide Locations				DS-C18 08/05
Hubbell Premise Wiring, Asia Pacific	852-2836-7131	Fax: 852-2836-7132	Hubbell Premise Wiring, Latin America	305-408-4501
Hubbell Canada Inc.	905-839-1138	Fax: 905-839-9108	Hubbell de Mexico, S.A. de C.V.	(5255) 9151-9999
Hubbell Premise Wiring, Central America	506-309-4158	Fax: 506-260-1616	Hubbell Premise Wiring, Middle East	971-4-393-4192
Hubbell Premise Wiring, China	8621-6309-0119	Fax: 8621-6309-0122	Hubbell-Taian Co., Ltd., Taiwan	886-2-2522-1862
Hubbell Premise Wiring, Colombia	571-245-8940	Fax: 571-340-0925	Hubbell Premise Wiring, Turkey	90-216-313-5016
Hubbell Premise Wiring, Europe	44-01283 500500	Fax: 44-01283 500400	Hubbell Premise Wiring, Venezuela	58-416-680-7453
Hubbell Int'l. Inc., Korea Branch	82-2-(0)2607-1363	Fax: 82-2-(0)2603-7386		

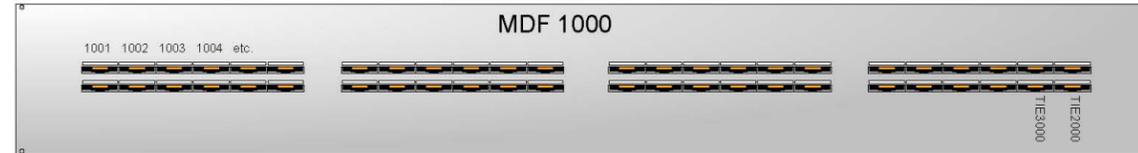


# KLEIN INDEPENDENT SCHOOL DISTRICT FACILITY AND SCHOOL SERVICES DEPARTMENT

## STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES

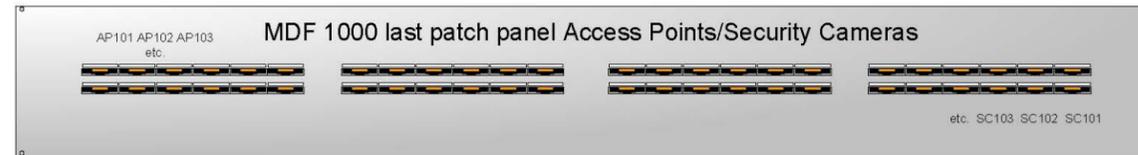
### PATCH PANEL LAYOUT

#### MDF 1000

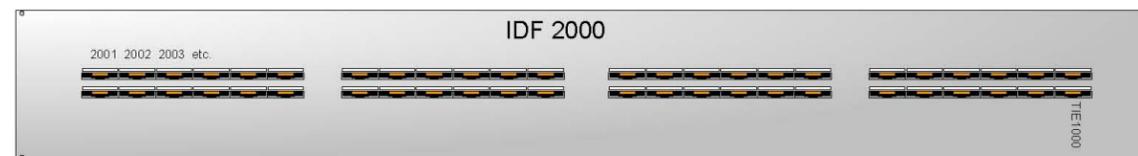


Additional Data Patch Panels as required to accommodate drops (up to 375 drops total)

#### MDF 1000 last patch panel Access Points/Security Cameras



#### IDF 2000

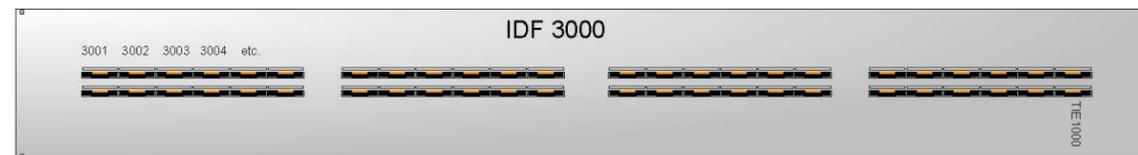


Additional Data Patch Panels as required to accommodate drops (up to 375 drops total)

#### IDF 2000 last patch panel Access Points/Security Cameras



#### IDF 3000



Additional Data Patch Panels as required to accommodate drops (up to 375 drops total)

#### IDF 3000 last patch panel Access Points/Security Cameras



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**VIDEO EQUIPMENT**

- Ceiling mounted projectors shall be mounted 13 feet from the screen with a throw of 12 to 14 feet.
- Low/High connections shall be provided in the deepest possible double gang box.
- Provide wall accessible power interrupt switch for all wall and ceiling mounted projectors.
- The following equipment shall be provided for all small stadiums equipped with a press box.

VIDEO WALL PLATE REQUIREMENTS	
QUANTITY	DESCRIPTION
1	HDMI
1	2 Channel Audio with RCA Connectors
1	2 Channel Audio with 3.5mm Connectors
1	VGA (15 pin)
1	Composite Video – RCA
1	USB (interactive devices only)

**LOCAL SOUND**

- Provide local sound reinforcement system in the following venues
  - Cafeteria
  - Gymnasium
  - Press Box
  - High School Dance Gym
- PA systems with wall-mounted volume controls must include an override capability so that all-call announcements are heard when the volume control is turned to low volume or off.
- Local sound system shall have ducking capability during an alarm signal from the fire alarm system.
- Local sound systems shall be capable of overcoming the ambient sound level of the venue.
- Provide assisted listening system for each venue.

LOCAL SOUND EQUIPMENT – PRESS BOX	
QUANTITY	DESCRIPTION
1	Wall Mounted Rack with fan and filter kit
1	Soundweb London Network DSP or approved equivalent
1	Network Amplifier
1	Shure "handheld SM58" style microphone
1	25 ft microphone cord and desktop microphone stand
1	Headset Microphone
2	Danley outdoor series speakers or approved equivalent,

LOCAL SOUND EQUIPMENT – CAFETERIA	
QUANTITY	DESCRIPTION
1	Minimum 18RU wall mounted cabinet with perforated filler panels and fan and filter kit.
1	Soundweb London Network DSP or approved equivalent
1 (min)	Network Amplifier
2	Wireless microphone
1	Headset Microphone
	Speaker design will be based on space layout per campus.



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LOCAL SOUND EQUIPMENT – GYMNASIUM	
QUANTITY	DESCRIPTION
1	Minimum 18RU wall mounted cabinet with perforated filler panels and fan and filter kit.
1	Soundweb London Network DSP or approved equivalent
1 (min)	Network Amplifier
1	Wireless Microphone
2	Headset Microphone
1	Portable sound rack (intermediate and high schools only)
	Centrally mounted speaker(s)

LOCAL SOUND EQUIPMENT – DANCE	
QUANTITY	DESCRIPTION
1	Minimum 18RU wall mounted cabinet with perforated filler panels and fan and filter kit.
1	Soundweb London Network DSP or approved equivalent
1 (min)	Network Amplifier
2	Headset Microphone
	Speaker design will be based on space layout per campus.

**CLASSROOM SOUND ENHANCEMENT SYSTEM – ELEMENTARY SCHOOL**

- Basis of Design: Lightspeed – 1x2 tile speaker, hands-free microphone with charging station in all classrooms and as directed by owner.

**PUBLIC ADDRESS SYSTEM**

- PA systems with wall-mounted volume controls must include an override capability so that all-call announcements are heard when the volume control is turned to low volume or off.
- Any systems that interface with users via computer software must utilize Microsoft Active Directory for authentication.
- Provide 25V Hybrid PA System
- Provide 2x2 tile speakers for acoustical ceilings.
- Provide coverage at student drop off areas, service yards and outdoor play areas.
- Public address system shall be zone based as directed by owner.
- System shall interface with VOIP phone system.
- Provide speaker horns in central plants and large mechanical spaces.
- No clock system is required.
- Provide emergency power for PA head end.

**List of Acceptable Electrical Equipment Manufacturers:**

EQUIPMENT	MANUFACTURER
PA System	Rauland or Telecor

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## ELECTRONIC SAFETY AND SECURITY

### 28 16 00 - Intrusion Detection

- Consult with OWNER for latest model numbers for intrusion alarm devices
- CONTRACTOR shall obtain permits, if required.
- The intrusion detection system shall be a turn-key system that is addressable and microprocessor based. It shall include the controls, communicator, modules, interfaces, relays, wiring, transformers, batteries, keypads and devices.
- The CONTRACTOR shall meet with the OWNER prior to doing any programming, assigning zones or assigning partitions.
- The system shall have the capability to communicate all alarm signals to the OWNER Police Department dispatch office.
- Controller shall be installed in the MDF room.
- District Standard for Intrusion Detection Systems:
  - MAXSYS 16-128 CONE CONTROL PANEL W/ CABINET, DSC-PC4020
    - Cabinet PC4050C
    - Plain Language Keypads DSC LCD4501
      - Keypads shall be located in the following areas:
      - Administration
      - Kitchen
      - Custodial Entrance
      - Alternate teacher entrance
      - Athletic areas (high schools only)
    - DSC TL250 network communicator
    - MAXSYS 8 HDWE ZONE EXPANDER DSC DSC-PC4108
    - DSC AMB-500 or Bravo 5 (360 Motion detectors)
    - Bravo BV-400 (Long range Motion detectors)
    - AL300ULPD8CB Altronix Power Supply for Motion Detector Power
    - BATTERY, 12V 7AH One for Main Panel and One for Motion Detector Power – label each battery with date of installation.
    - DSC with PC4204/CF 16 V Power Supply for Alarm Panel, with relay output module
    - Altronix BC100 Enclosure (or equivalent) for Expansion Cards
  - The system shall have the following features:
    - 3,000 event buffer
    - False alarm prevention
    - System printer capability
    - 2-way serial port
    - Programmable from the LCD keypads
    - Remote enunciator
    - Low power outputs; up to 144 outputs capable of supplying 50ma at 12VDC
  - Provide a door contact on all roof hatches.
  - Provide separate Kitchen zone and alarm code.
  - Provide motion sensors inside all exterior doors and in first floor corridors that serve exterior classrooms with window(s). Cover the path of ingress with motion sensors, but not each individual room.
  - Provide motion sensors inside any door that leads to the exterior including any doors with access to the roof.
  - Provide in-rail contacts for all exterior roll-up doors.
  - Do not place guard covers over motion detectors except in harsh environment such as gyms.
  - All intrusion detection system wiring must be in D-Ring hangers. **No wiring is to be attached to the building structure with tie-wraps.**
  - Home run all wiring devices to the control panel or zone expander; an addressable loop system is not acceptable.
  - Alarm systems must have a dedicated 120 VAC circuit on an emergency power panel.
  - Intrusion detection system shall be one system for entire building, armed and disarmed from any keypad in the building.
  - Update (2) district dispatch consoles to latest version of Incident Management Software.
  - The following nomenclature is suggested for drawings to specify the intrusion detection system:
    - B – Alarm Bell On Outside Of Building
    - S – Alarm Siren Below Ceiling In Main Building and Kitchen (sirens shall be on separate circuits)



**KLEIN INDEPENDENT SCHOOL DISTRICT**  
**FACILITY AND SCHOOL SERVICES DEPARTMENT**

**STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES**

- MS – Motion Sensor
- CMS – Ceiling Motion Sensor
- DDC – Double Door Contact
- DC – Door Contact
- RH – Roof Hatch Contact
- RU – Roll Up Door Contact
- GB – Glass Break
- KP – Keypad
- IC – Intercom

**28 20 00 – Electronic Access Control**

- Consult with OWNER for latest model numbers for, access control, CONTRACTOR shall obtain permits, if required.
- The access control system shall be a turn-key system that is addressable, and microprocessor based. It shall include the card readers, Mercury panels, LifeSafety Enclosures, credentials, and batteries
- The CONTRACTOR shall meet with the OWNER prior to doing any programming..
- The system shall have the capability to integrate with the district's VMS platform, Video Insight. Integrator to converge systems, prior to competition of programming.
- Controller shall be installed in the MDF room.
- District Standard for Access Control is Open Options
  - Life Safety Panel FPO75-D8PE4M, sized as necessary based on campus installation. Include NL2 monitoring module.
    - Provide emergency power to each access control enclosure.
    - Upstream panel to be Open Options SSP-EP
    - All RS-485 communication buses shall exist within an Open Options Optohub
    - Each provided cabinet shall have (2) 12V 7Ah battery, each battery to be wired in series and include labels of the install date on the front side.
    - Each newly provided exterior access-controlled door shall have an AD300, with an Electronic Power Transfer located within the hinge of the door.
    - Standard card readers shall be Schlage MT15 or MT11, depending on installation location
    - All video intercom devices to be AiPhone IX Series or approved equal. Shall be mounted directly to front door.
- Provide access control at each exterior entry. Only one door needs to be controlled for each group of doors.
- Provide access control at each IDF/MDF room door with rim mounted strike with wall mounted card reader.
- Review access control requirements for interior doors at main entry with OWNER.
- Provide license for every access control device plus an additional 10% for attic stock

**28 23 00 - Video Surveillance**

- The following equipment will be purchased by the CONTRACTOR using the Technology Allowance and installed by the CONTRACTOR. Technology allowance shall be determined by the OWNER.
- Camera locations will be determined by the OWNER based on the building layout.
  
- Data cable for exterior and wall mounted camera locations shall be terminated above the ceiling or in a plenum space near the camera with a female 8P8C connector mounted within a biscuit box . Label the grid directly below the installed location, label shall be black with white lettering. All cables supporting cameras shall have a 15' service loop located above ceiling. Provide angled ¾" conduit with pull string from biscuit box through exterior wall to prevent leaks. Terminate ¾"C. in exterior junction box to receive camera mount. Camera will be connected via a patch cable.
- Ceiling mounted installations are mounted directly in a ceiling tile without the Flush Ceiling Mount Bracket unless specifically requested by Klein ISD . Mount the camera near the corner of a ceiling tile to allow for aiming the camera by rotating the ceiling tile.
- Data cable for interior camera locations shall be specified to be terminated in a junction box above the ceiling near the camera with a female 8P8C connector mounted within a biscuit box above the ceiling. Label the grid directly below the installed location, label shall be black with white lettering. All cables supporting cameras shall have a 15' service loop located above ceiling. . Camera will be connected via a patch cable. edit
- System must be IP based and be capable of real time monitoring from any district facility via the district's wide area network.
- 
- Lightning protection must be provided with all pole-mounted cameras.
- All power supplies, surge protection, cabling, and other equipment required for a complete functional system are to be included in the **Base Bid**.

**28 31 00 - Fire Detection and Alarm**

- Consult with OWNER for latest model numbers for fire alarm,.
- OWNER approved fire alarm manufacturers are Edwards and Simplex..
- The system shall have the capability to communicate all alarm signals to the Klein ISD Police Department dispatch office. Primary communication will be made over single-mode fiber connection. Secondary communications shall be over the district network.
- Fire alarm CONTRACTOR shall test every individual input and output device to confirm operation and to confirm that the device ID is correct in the system for addressable devices. A test report shall be provided in electronic



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format. A state licensed NICET II minimum and factory trained technical representative of the manufacturer shall supervise the final control panel connections and testing of the system. Upon completion of the acceptance tests, the owner and/or his representatives shall be instructed in the proper operation of the system. **OWNER shall be notified at least 24 hours two KISD business days before the test and shall witness all testing.**

- On renovation and additions projects provide a certified fire alarm test of the complete system at 1-month prior to the end of the warranty period and correct any and all items located in the area of renovation to bring the system to an approved status at no cost to the Owner. Clean all smoke detectors and replace all defective parts within the area of renovation at no cost to the Owner.
- All fire alarm wiring must be in D-Ring or approved equivalent hangers. **No wiring is to be attached to the building structure with tie-wraps.**
- No ion type smoke detectors.
- All Fire Alarm systems equipment including transceivers, remote battery cabinets, panel extenders, audio amplifiers must have dedicated 120 VAC circuit on an emergency panel with permanent lock-on device and Owner's approved lock.
- Fire Alarm CONTRACTOR must update the fire alarm zone maps any time changes are made. This includes added or deleted devices for all projects including additions, renovations, portable building moves and new construction.
- 
- All buildings constructed with a fire sprinkler system must have a sign located near the fire department connection that states "FDC". Specify signage that meets the current requirements of the local fire jurisdiction.
- Provide expansion capability on fire alarm panel to accommodate the addition of future portable buildings to the fire alarm system. Provide an expander panel for future portable buildings near the location that the spare fire alarm conduits for portable buildings are stubbed up in the MDF or IDF room.
- For renovated projects – provide pre-functional testing for fire alarm system and provide report to the OWNER.
- Provide smoke detectors in the following locations:
  1. All paths of egress and adjoining spaces within the same HVAC envelope including but not limited to: corridors, hallways, stairs, lobbies, and elevator landings.
  2. At each electrical room, telecommunications/data room, elevator machine room, kiln room, and mechanical room not subject to un-treated or un-filtered outside air.
  3. At each computer lab/room.
  4. At each library, library office and library ancillary areas.
  5. At each storage room, stock room, or warehouse space.
  6. At each pre-K and kindergarten classrooms.
  7. At nurse's area/clinic and patient care/cot areas.
  8. At each men's and women's restroom/toilet
  9. At each administrative work room or copy room.
  10. At each student toilet / restroom. Provide STI protective cover. Do not locate over plumbing fixtures or near partitions.
- 11. At each special needs, life skills, adaptive behavior, developmental classrooms or similar designated areas without food preparation or cooking equipment. Provide heat/thermal detectors in the following locations:
  1. At each electrical room, telecommunications/data room, elevator machine room and mechanical room subject to un-treated or un-filtered outside air.
  2. At each janitor's/custodial closets and laundry rooms.
  3. At each commercial kitchen and adjoining storage rooms; at each food preparation area.
  4. At each employee break room/lounge.
  5. At each vocational shop.
  6. At each science, physics, chemistry, or biology classroom and their associated preparation and storage rooms.
  7. At each special needs, life skills, adaptive behavior, developmental classrooms or similar designated areas with food preparation or cooking equipment.

Provide carbon monoxide detection and smoke detection devices in all areas designated as day-care for minors.

Provide duct smoke detectors in all air handling units with air volumes of 2,000 cfm or larger.

Provide duct smoke detectors on outside air units only as required by local Code and / or A.H.J.

Provide VESDA type detectors at the following locations when appropriate:

1. Atriums to avoid exposed conduits.
2. High ceiling areas 25 feet and higher where maintenance of spot type detectors will be difficult.
3. Skylights to avoid exposed conduits.
4. Coolers/Freezers 200 square feet and larger.

Provide manual pull stations at each exterior exit and at each exit from all floors only if required by local AHJ or if the building is not fully sprinklered. Provide one manual pull station at the central reception area as directed by Owner.

Provide weatherproof exterior audio/visual alarm devices mounted on the building at the exact location as directed by Architect:

1. Main entry.
2. Courtyards and outdoor assembly areas adjacent to the building.
3. Mechanical yards adjacent to the building.
4. Covered playgrounds or covered assembly areas adjacent to the building.
5. Additional locations where indicated on drawings.
6. Outdoor paved play areas.



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Provide audio and visual alarm devices in all areas normally occupied by students or minors and all common use areas.

The alphanumeric display shall indicate all applicable information associated with the alarm/trouble condition including: device location based on actual room graphic name and number (not architectural plan names and numbers), device type, and time of alarm. Location and zoning messages shall be custom field programmed to respective premises. Provide abbreviations when required to fit the alarm panel's display format (verify exact requirements with Owner). Below are some examples which first indicate the physical location of the device hardware – then the TYPE of device at the end of the descriptor label:

- 1) "Corr 1100 at Rm 1102 - SMOKE" (at Room number shall be the nearest room door to the device).
- 2) "Corr 1200 at Rm 1203 - PULL STATION" (at Room number shall be the nearest room door to the device).
- 3) "Mech Rm 1352 AHU-11 - DUCT SMOKE"
- 4) "Mech Rm 1467 - WATERFLOW SWITCH"
- 5) "Mech Rm 1589 - TAMPER SWITCH"
- 6) "Kitchen 1623 - HOOD FIRE SUPPRESSION SYSTEM"
- 7) "MDF 1733 - DAS RADIO POWER SUPPLY"
- 8) "Mech 1855 for Atrium 1863 - VESDA SMOKE"

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## DIVISION 31

### EARTHWORK

#### 31 31 16 - Soil Treatment

- Consult with OWNER regarding the requirement for soil treatment on projects.

#### 31 00 00 – Misc.

- Coordinate the Dewatering Allowance with the owner in all new construction contracts.
- Maintain a green barrier or buffer around the perimeter of the property.
- Designate areas where underbrush is to be removed but where a canopy of trees 4" or larger is to be saved.
- Remove all Chinese Tallow and Yaupon trees of any size.
- Prior to construction, use physical barriers to protect green areas from construction activities and debris. The general CONTRACTOR is responsible for monitoring the SUB-CONTRACTOR'S activities to preserve and protect the identified green spaces.
- CONTRACTOR shall use line locator services before beginning trenching or digging. CONTRACTOR is responsible for onsite utility damage for utilities marked on plans or marked by locator services.
- Provision must be made for entrance of an ambulance and/or other emergency vehicle into all outdoor athletic areas.
- All site and mechanical yard fencing gates to be 12' wide, minimum.
- Ensure grade around building is below weep holes in brick and slopes away from the building.
- Provide a concrete runner (18"-24") around perimeter of building to prevent water intrusion due to landscaping.
- Provide a potable water hose bib at remote areas of athletic fields.

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## DIVISION 32

### EXTERIOR IMPROVEMENTS

#### 32 80 00 - Irrigation

- Radio controlled irrigation systems are not allowed; no exceptions.
- Coordinate design of irrigation system closely with OWNER for control valve locations, equipment and materials. Locate all control valve boxes outside of athletic field play areas.
- Control valves are to be centrally located and grouped as much as possible.
- Irrigation controllers must be located inside the school building, preferably in a mechanical room.



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- No 2-wire irrigation systems allowed.
- Schedule 40 pipe is required for all irrigation piping. Schedule 200 pipe is not permitted.
- Irrigation system drawings must be reviewed by OWNER prior to starting the installation. The installation is to be inspected by OWNER.
- Irrigation pressure test must be observed by OWNER before final grading.
- Sprinkler systems that connect to hose bibs are not permitted.
- Install a metallic strip, tape or tracer wire on all PVC or non-metallic underground piping to aid in locating pipe in future.
- **Christy's Red Hot Blue Glue** is required in conjunction with primer.
- Rain sensors must be incorporated into the system to preclude the system activating during periods of rainfall and to avoid inadvertent over-watering.
- System to be installed with swing joints at all head locations.
- Heads must be selected (type: i.e., bubbler, 360, 180, etc.) and adjusted so that no water is sprayed directly onto a structure, in a no-wind condition.
- Backflow preventers must be installed in the irrigation system. Installation must be tested and registered with the applicable municipal authority and a copy must be given to OWNER and municipal authority.
- All backflow preventer piping and above ground system piping must be Type "K" copper piping.
- A complete set of irrigation system "as built drawings" must be given to OWNER at the completion of the job.
- OWNER must inspect and approve the installation prior to substantial completion.
- Install irrigation systems at the front of the school and perimeter of building, in parking lot islands and, at the intermediate schools and high schools, on selected athletic fields.
- District Standard for Irrigation Equipment:

Controller ..... **Baseline 3200 or Calsense ET2000e**  
 Valves ..... **Hunter or Rain Bird**  
 Tree Bubblers ..... **Hunter or Rain Bird Drip-Type**  
 Standard Duty Heads..... **4" pop-ups with adjustable epoxy heads**  
 Athletic Field Heads ..... **Hunter I20, I25 or I40 Stainless Steel**

- Athletic field irrigation heads to be **Hunter** only full circle and adjustable with no substitutions.
- Tree bubblers to be zoned separate from sprinkler zones.
- Drip systems will be allowed in shrub beds with OWNER approval.
- Contractor is responsible for watering all landscaping, grass, trees, etc. until substantial completion or beyond based on contract requirements.

**32 90 00 - Planting**

- Incorporate shade trees in play areas, gathering areas and in parking lot islands.
- Incorporate trees and shrubs that lend themselves to providing a safe school environment. In general, apply the 3' and 7' rule: plant shrubs which can be trimmed no higher than 3' above the ground and trees which can be elevated to a minimum of 7' above the ground.
- Plant trees a minimum of 15' from buildings and to allow for mature size of tree.
- Do not plant trees in a location that will grow to block any wireless access point line of sight coverage.
- Use plants and landscaping material that are appropriate for a school setting (e.g., no berry producing plants, no use of cobblestone or pebbles).
- Use plants and trees that perform well in the local climate.
- Use Bermuda grass rather than St. Augustine.
- Provide adequate drainage, especially in front entrance landscape beds.
- No flower beds adjacent to buildings.
- Double strip of sod around building.
- Solid sod apron skirts around all drains.
- Provide a one-foot wide section of solid sod along sidewalks, driveways and parking lots. Large open areas will be drill seeded or hydro-mulched with a mixture of grass seed, fertilizer and mulch. Seed mixture should include common Bermuda with Rye grass seed added if applied during winter months.
- Areas between sidewalks and buildings are to be solid sod.
- Use landscape to screen dumpster and mechanical equipment from public view.

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**DIVISION 33**

**UTILITIES**

- All storm drain catch basins to be packed with stabilized sand 5 feet around basin and around joints and fittings.



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**STANDARDS FOR CONSTRUCTION AND RENOVATION OF DISTRICT FACILITIES**

- Design storm water catch basins to be aligned with natural features such as parking lot lanes, property lines, curbs, traffic flow, fences, etc.
- All piping to be packed in stabilized sand when under concrete driveways, parking lots or pads. All joints to be packed in stabilized sand not under concrete.
- Design storm sewer details in accordance with City of Houston standards.
- Storm water quality units manufactured from high density polyethylene (HDPE) by Advanced Drainage Systems, Inc. are acceptable in lieu of reinforced concrete contingent upon OWNER approval.
- All storm water piping is to be RCP for sizes 24" and above unless otherwise approved by OWNER.
- All storm water piping is to be grouted inside and outside where it enters or exits a catch basin or other storm water device.
- Provide a separate irrigation and cooling tower water meter to avoid sanitary sewer charges.
- At new construction sites 4" diameter schedule 40 PVC irrigation sleeves must be installed under paving, sidewalks, etc. to connect all green areas, including islands, for future system installation or expansion of irrigation system.

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## MISCELLANEOUS PROVISIONS

- **WARRANTIES: All normal and extended warranties shall include parts, labor, miscellaneous materials, travel time, incidental expenses, freight/shipping, refrigerant, oils, lubricants, belts, filters and any expenses related to service calls required to diagnose warranty problems.**
- All mechanical yards must be paved with concrete.
- Textbook storeroom size; Compute by taking the designed student load for the building times 1.5 cu. ft. of shelf space.
- Provide furniture storage room as large as practical and affordable.
- Basketball backboards and goals shall be manufactured by **BPI**; shall be heavy-duty aluminum with breakaway mechanism on drawings.
- Bicycle racks furnished and installed by CONTRACTOR. Concrete pads installed by CONTRACTOR.
- Natural lighting shall be provided whenever practical to reduce lighting demands and enhance the environment. Particular attention shall be paid to common areas and meeting areas.
- Southern exposure windows shall be covered with an overhang to prevent direct sunlight from entering the building space.
- All new facilities shall be designed with energy conserving features where practical.
- **Karl Schaack** (PCI) is the **District Roofing Consultant**. The OWNER may contract with PCI to review roof standards and observe installation. Email: [kschaack@priceconsulting.com](mailto:kschaack@priceconsulting.com) Phone: (281) 209-1724
- Provide MSDS sheets on all materials used as part of close-out documents.
- All bus drives to be designed to accommodate school bus height and swing. If necessary, raise overhangs and place columns a sufficient distance from the curb to prevent damage.

## Floors

### Elementary School Floor Finishes

- **C&A Abrasive Action:** all building entrances.
- **Luxury Vinyl Tile (LVT):** multipurpose rooms, clinic, wet areas in some classrooms, book room, furniture storage, teacher workrooms and lounge.
- **Carpeting:** classrooms, hallways in academic areas, offices, music room, stage floor and library.
- **Ceramic tile:** bathrooms and in front of water fountains (ensure that enough tile is provided to avoid wet areas on the carpet in front of water fountains)
- **Porcelain ceramic tile:** cafeteria, some hallways and accent areas.
- **Quarry tile:** kitchen (see standards under Division 9).
- **Sealed concrete:** mechanical rooms and janitor's closets.

### Intermediate and High School Finishes

- **C&A Abrasive Action:** all building entrances.
- **Luxury Vinyl Tile (LVT):** art, science and certain career tech classrooms, clinic, teacher workrooms and lounge, storage rooms and book room.
- **Carpeting:** classrooms, offices, learning resource center, amphitheater, band, choir and orchestra. Intermediate school stage is carpet with wood accent front.
- **Ceramic tile:** bathrooms and in front of water fountains (ensure that enough tile is provided to avoid wet areas on the carpet in front of water fountains).
- **Porcelain ceramic tile:** cafeteria, some hallways and accent areas.
- **Quarry tile:** kitchen (see standards under Division 9).
- **Concrete floor coating (epoxy):** dressing rooms, locker rooms, some career tech rooms.
- **Wood:** high school competition gymnasium and high school stage (verify with OWNER).
- **Synthetic sports surface:** all gyms in intermediate schools and practice gym in high schools (verify with OWNER).
- **Sealed concrete:** auto shops, agriculture shops, woodworking and scene shops.



## Walls

### Elementary School Walls

- **Concrete block:** all high use areas, gyms, cafeteria and kitchen (verify with OWNER).
- **Base:** Use **Roppe** black/brown color rubber base (Do not use ceramic faced CMU base blocks).
- **Ceramic tile:** rest rooms (verify tile specification, size and pattern with OWNER).
- **Painted gypsum:** on all interior walls not specified as CMU.
- **Vinyl-covered gypsum:** on all interior corridor walls not specified as CMU. Do not use vinyl-covered gypsum on exterior walls.
- **Ceramic wall tile** at high traffic area corridors to a height appropriate to the age group.

### Intermediate and High Schools Walls

- **Concrete block:** all corridors. Do not use folding partition walls unless directed by OWNER.
- **Base:** Use **Roppe** black/brown color rubber base (Do not use ceramic faced CMU base blocks)
- **Ceramic tile:** rest rooms (verify tile specification, size and pattern with OWNER).
- **Painted abuse resistant gypsum:** on all interior walls up to 9' or 10' (depending on ceiling height) for walls not specified as CMU.
- **Vinyl-covered gypsum:** on all interior corridor walls not specified as CMU. Do not use vinyl-covered gypsum on exterior walls.
- **Ceramic wall tile** at high traffic area corridors to a height appropriate to the age group.

END OF DOCUMENT