DESOTO ISD
BOND 2025

October 26, 2026

Board Meeting

Board of Trustees,

Consideration and possible approval of Technical Design Guidelines (TDGs) and Educational Specifications (Ed Specs). Approval is necessary to establish consistent District standards and expectations for the planning, design, and construction of District facilities. These documents provide a common framework for architects, engineers, contractors, and District staff, helping ensure that projects are designed to meet the District's educational, operational, technical, and facility requirements.

These guidelines will help support consistent project quality, reduce design inconsistencies, and improve coordination throughout the design and construction process.

Board approval will establish these guidelines as the basis for implementation on applicable future projects.

Thank you for your consideration.

9/18/2026

DeSoto Independent School District
Educational Specifications

Mission

The mission of DeSoto ISD is to ensure students, without exception, learn and grow at their highest levels.

Vision

Soaring Higher.

DeSoto Promise

Every child in DeSoto ISD is special and unique. Every child deserves respect. Every child will learn and succeed.

Core Values

- Collective Excellence
- Relentless Equity
- Community Greatness
- Unconditional Belonging
- Courageous Learning

Pedagogical Framework

- Student-centered, emphasizing the whole child (social, emotional, and academic).
- Grounded in the 4 Cs (Critical thinking, Communication, Collaboration, Creativity).
- Supported by technology integration that enhances personalized learning.
- Aligned with early literacy initiatives ensuring all students read on grade level by third grade.
- Inclusive, with equitable opportunities for students of all backgrounds and abilities.

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Purpose of Educational Specifications

Educational Specifications are a required planning document under the Texas Education Agency's Facility Standards (19 TAC § 61.1040–1044). They serve as the official bridge between DeSoto ISD's educational mission, instructional goals, community values and the physical design of its schools.

These educational specifications are intended to:

Define the District's Priorities: Translate DeSoto ISD's mission, vision, the DeSoto Promise, and instructional philosophy into facility requirements.

Ensure Compliance: Provide a TEA-approved framework that demonstrates alignment with state standards for instructional adequacy, safety, and inclusive design.

Guide Design Professionals: Communicate clearly to the architect, engineers, and planners the programmatic needs, space requirements, and operational considerations for each level (elementary, middle, high school).

Support Long-Range Planning: Offer a consistent, board-adopted reference that informs capital improvement projects, bond planning, and renovation priorities for at least the next five years.

Promote Equity and Innovation: Ensure that every school facility provides safe, flexible, inclusive, and sustainable learning environments where every student is valued, respected, and positioned for success.

This Educational Specifications document is not a prescriptive rulebook, but rather a foundation to ensure equity, functionality, and future-ready design across all DeSoto ISD campuses. It is understood that, throughout the design and documentation process, some deviations or modifications may occur. These may be driven by factors such as:

- Conflicting priorities or requirements identified during planning and design development.
- Site-specific or programmatic needs that arise and were not anticipated during preparation of this document.
- Budgetary constraints that may necessitate adjustments to square footage, materials, built-in elements, or infrastructure systems.

Facility Overview

- Elementary School
    - Campus Type: Elementary School (Grades K–5)
    - Maximum Enrollment Capacity: 400-500 student functional capacity (scalable as needed). To be determined by project specific enrollment projection
    - Projected Enrollment Window: Based on 10-year demographic trends
    - Program Priorities: Early literacy, whole-child learning, and secure, welcoming community access.
- Middle School
    - Campus Type: Middle School (Grades 6–8)
    - Maximum Enrollment Capacity: 400-500 student functional capacity (scalable as needed). To be determined by project specific enrollment projection
    - Projected Enrollment Window: Based on 10-year demographic trends
    - Program Priorities: Creating spaces that are flexible, adaptable, and collaborative to meet evolving learning needs
    - Academic Campus deviated from traditional campus for program specific needs
- High School
    - Campus Type: High School (Grades 9–12)
    - Maximum Enrollment Capacity: 2,000-3,000+ student functional capacity (scalable as needed). To be determined by project specific enrollment projection.
    - Projected Enrollment Window: Based on 10-year demographic trends
    - Program Priorities: Creating technology-rich, flexible learning environments, including large collaboration areas, a “technology bar,” and flexible teaching walls to support project-based learning.
    - Academic Campus deviated from traditional campus for program specific needs

Safety & Emergency Planning

- Integration of district Multi-Hazard Emergency Operations Plan (TEC § 37.108).
- Secure front vestibule with controlled access.
- A visitor policy that identifies the requirements governing access to each campus.
- Clear sightlines in hallways and open areas.
- Tornado shelter designed to meet state safety standards (for capacity of school in new instructional facilities and additions, not required for renovations).
- Classroom pod lockdown capability and wayfinding systems for first responders.
- Direct exterior exits out of each classroom pod in an event of an emergency.
- Silent panic alert systems (HB 3 compliant).

Inclusive Design Goals

- In alignment with the DeSoto Promise, facilities will be designed so that every child feels respected and supported in their learning.
- Inclusive design will ensure that spaces meet diverse learning needs and provide environments where every student can succeed.
- Flexible learning zones that support diverse instructional needs—from independent reflection to collaborative project work
- Technology integration (e.g., hubs, digital breakout areas) that enable differentiated modalities tailored to individual learners.

Quantitative Space Requirements

Elementary School (400-500 students)

Space Name	NSF	Capacity per Room	Max Capacity	**Functional Capacity**	Notes
Academic Core Space				**90%**	Capacity calculations based on TEA Flexibility Level 2 (36 sf per pupil)
Kindergarten Classroom	800	22		20	
K Restroom	50				
1st Grade Classroom	800	22		20	
2nd Grade Classroom	800	22		20	
3rd Grade Classroom	800	22		20	
4th Grade Classroom	800	22		20	
5th Grade Classroom	800	22		20	
CTE/Collaboration	1,100	26		23	
CTE Storage	150			-	
Teacher Collaboration	500			-	
Book/Materials Storage	300			-	
Special Programs				**50%**	Capacity calculations based on TEA Flexibility Level 2 (45 sf per pupil)
Self-Contained Special Education	1000				
Spec Ed Storage	200				
Spec Ed Restroom/Shower	100				
Spec Ed Kitchen	90				
Sensory Room	90				
Fine Arts				**0%**	
Music Classroom	1,100				
Music Storage	200				
Art Classroom ES	1,100				
Kiln	200				
Art Storage	200				
Physical Education				**0%**	
Elementary Gym	3,600			-	
Gym Office	150				
Gym Storage	250				
Restrooms	300				
Media Center					reference TEA requirements
Library Media Center	1,700				3sf min. for every student over 500
Library Workroom/Office	150				
Library Storage	125				
Tech Storage	200				
Administration					
Principal Office	200				
Asst Prin Office	120				
ISS Room	200				
Open Office	120				
PEIMS/Attendance	120				
Reception/Waiting room	600				
Lounge	600				
Workroom/Mail/Copy	300				
Workroom Storage	100				
Conference Room	300				
Vault/Record Storage	120				
Clinic	300				
Restroom and Bath, Student	100				
Nurse's Office	120				
Office, Administration, Counselor	150				
Counselor/Testing Storage	80				
SRO Office	120				
Zen Den	150				

Quantitative Space Requirements

Elementary School (400-500 students)

Food Service		reference TEA requirements
Cafeteria	3,225	
Stage	800	
Ramp	150	
Kitchen and Serving	2,230	
Locker/ Dressing	50	
Restroom	50	
Walk-in Freezer	205	
Walk-in Cooler	300	
Warewashing	230	
Dry Food Storage	265	
Child Nutrition Manager's Office	75	
Table and Chair Storage	250	
Custodial/Utility Closet	90	
Washer/Dryer	80	

Service and Support	
Restroom, Student - Boys	250
Restroom, Student - Girls	250
Restroom, Staff - Male	60
Restroom, Staff - Female	60
MDF Room	120
IDF Room	80
General Receiving	300
Custodial Closet	50
Electrical Closet	100
Fire Riser	100
Mechanical Room	140
Main Electrical Room	200
Electrical Distribution Rooms	100
Boiler Room	150
Custodian Office/Receiving	200
Storage Outside	200

Quantitative Space Requirements

Middle School (1,200 students)

Space Name	NSF	Capacity per Room	Functional Capacity	Notes
Academic Core Space			**75%**	Capacity calculations based on TEA Flexibility Level 2 (32 sf per pupil)
English/Language Arts Classroom	800	25	0	
Math Classroom	800	25	19	
Social Studies Classroom	800	25	19	
Science Lab	1,600	28		
Science Prep/Storage	200			
Foreign Language Classroom	800	25		
Student Collaboration	600			
Teacher Collaboration	500			
Book/Materials Storage	300			
Department Storage	200			
Special Programs			**50%**	Capacity calculations based on TEA Flexibility Level 2 (45 sf per pupil)
Self-Contained Special Education	1000	15		
Spec Ed Storage	200			
Spec Ed Restroom/Shower	150			
Spec Ed Kitchen	90			
Career and Technology			**75%**	Capacity calculations based on TEA Flexibility Level 2 (32 sf per pupil)
Career and Tech Lab	1,400	24		
CTE Storage	200			
Fine Arts			**75%**	
Choir Room	1,200	21		
Choir Office	150			
Choir Music Storage	250			
Choir Uniform Storage	300			
Choir Practice Room	100			
Choir Ensemble Room	300			
Band	2,000	34		
Band Office	150			
Band Instrument Storage	300			
Band Music Storage	250			
Band Uniform Storage	300			
Band Practice Rooms	100			
Band Ensemble Room	300			
Theater	1,000	17		
Theater Office	150			
Theater Storage	250			
Theater Costume Storage	300			
Art Classroom	1,000	17		
Kiln	150			
Art Storage	250			
Auditorium (seating for 700)	6,500			
Auditorium Stage	1,500			
Auditorium Storage	400			
Auditorium Control Booth	200			
		90		

Quantitative Space Requirements

Middle School (1,200 students)

PE/Athletics			75%
Gym (seating for 600)	9,500	44	
Practice Gym	5,500	44	
Boys Locker Room	1,200		
Boys Showers	200		
Boys Restroom	175		
Boys Coaches Office	240		
Coach Restroom	175		
Girls Locker Room	1,200		
Girls Showers	200		
Girls Restroom	175		
Girls Coaches Office	240		
Coach Restroom	175		
Boys Athletic Storage	400		
Girls Athletic Storage	400		
PE Storage	400		

Library/Media Center		reference TEA requirements
Library/Media Center	3,500	3sf min. for every student over 500
Success Program Classroom	1,500	
Library Workroom/Office	200	
Library Conference Room	240	
Library AV/Storage	200	

Administration	
Principal Office	200
Asst Prin Office	120
ISS Room	400
Open Office	120
PEIMS/Attendance	120
Reception/Waiting room	600
Teacher's Lounge/Kitchen	800
Workroom/Mail/Copy	300
Workroom Storage	100
Conference Room	300
Vault/Record Storage	200
Clinic	300
Restroom and Bath, Student	120
Nurse's Office	120
Office, Administration, Counselor	150
Counselor/Testing Storage	80
SRO Office	120

Food Service		reference TEA requirements
Cafeteria		
Stage	800	
Ramp	150	
Kitchen and Serving	2,600	
Locker/ Dressing	50	
Food Service Staff Restroom	50	
Walk-in Freezer	110	
Walk-in Cooler	175	
Warewashing	230	
Dry Food Storage	290	
Child Nutrition Manager's Office	75	
Table and Chair Storage	250	
Custodial/Utility Closet	90	

Quantitative Space Requirements

Middle School (1,200 students)

Service/Support	
Restroom, Student - Boys	250
Restroom, Student - Girls	250
Restroom, Staff - Male	60
Restroom, Staff - Female	60
MDF Room	120
IDF Room	80
General Receiving	300
Custodial Closet	50
Electrical Closet	100
Fire Riser	100
Mechanical Room	140
Main Electrical Room	200
Electrical Distribution Rooms	100
Boiler Room	150
Custodian Office/Receiving	200
Storage Outside	200

Quantitative Space Requirements

High School (2,000 – 3,000 students)

Space Name	NSF	Capacity per Room	Max Capacity	**Functional Capacity**	Notes
Academic Core Space				**75%**	Capacity calculations based on TEA Flexibility Level 2 (32 sf per pupil)
Core Curriculum					
English/Language Arts Classroom		850	25	-	
Math Classroom		850	25	19	
Social Studies Classroom		850	25	19	
Classroom Flex (Sped Flex)		850	25	19	
Restroom		70			
Science Lab		1,500	28	21	
Science Prep/Storage		500			
Foreign Language Classroom		850	25	19	
Collaboration					
Open Student Collaboration		850			
Small Group Room		125			
Medium Group Room		400			
Teacher Collaboration		600			
Storage & Support					
Storage		200			
Book/Materials Storage		300			
AP Dispersed Office		150			
Restroom, Student - Boys		250			
Restroom, Student - Girls		250			
Restroom, Staff - Single Use		60			
Career and Technology				**75%**	Capacity calculations based on TEA Flexibility Level 2 (36 sf per pupil)
Business Management Classroom/Lab		1,100	26		
Information Tech Classroom/Lab		1,100	26		
Graphic Design & Comms Classroom/Lab		1,100	26		
Education and Training Classroom		1,100	26		
Health Science Classroom/Lab		1,100	26		
Health Science Storage		150			
Hospitality and Culinary Arts Classroom/La		1,100	26		
Hospitality Storage		200			
Construction Classroom/Lab		2,000	27		
Construction Storage		200			
Agribusiness/Engineering Classroom/Lab		2,000	27		
Ag Storage		200			
Special Programs				**50%**	Capacity calculations based on TEA Flexibility Level 2 (45 sf per pupil)
Dyslexia/RTI		400			
Resource Room		400			
Self-Contained Special Education		1000	22		
Spec Ed Storage		200			
Spec Ed Restroom/Shower		150			
Spec Ed Kitchen		90			
Diagnostician Office		150			
Speech Therapy		400			
Special Education Conference Room		300			

Quantitative Space Requirements

High School (2,000 – 3,000 students)

Fine Arts			**50%**	35 SF/ seated instrumentalist; 20 SF/ standing instrumentalist; 25 SF/vocalist
Auditorium				
Auditorium (seating for 700)	6,500			
Auditorium Stage	1,500			
Auditorium Storage	400			
Auditorium Control Booth	200			
Choir				
Choir Room	2,000	80		
Choir Office	150			
Choir Music Storage	250			
Choir Uniform Storage	300			
Band				
Band	3,600	103		
Band Office (space for two)	200			
Band Instrument Storage	700			
Band Music Sto / Cleaning Machine	400			
Band Uniform Storage	400			
Shared Performing Arts				
Practice Rooms	90			
Ensemble Room	400			
Small Ensemble Room	260			
Theater				
Theater Black Box	2,500	22		
Theater Classroom	850			
Theater Office	150			
Theater Storage	250			
Theater Costume Storage	300			
Dance				
Dance Room	2,000	22		
Dance Office	150			
Dance Prop/Music Storage	250			
Dance Uniform Storage	300			
Dance Locker Room	250			
Visual Arts				
2D & Digital Art Classroom	1,000	22		
Kiln	150			
Art Storage	250			
3D Art Classroom	1,000	22		
Storage	250			

PE/Athletics			**75%**
Gym (seating for 600)	9,500	22	
Practice Gym	5,500	22	
Boys Locker Room	1,200		
Boys Showers	200		
Boys Restroom	175		
Boys Coaches Office	240		
Coach Restroom	175		
Girls Locker Room	1,200		
Girls Showers	200		
Girls Restroom	175		
Girls Coaches Office	240		
Coach Restroom	175		
Boys Athletic Storage	400		
Girls Athletic Storage	400		
PE Storage	400		

Quantitative Space Requirements

High School (2,000 – 3,000 students)

Library/Media Center		reference TEA requirements tab
Library/Media Center	7,500	2sf min. for every student over 2,000
Success Program Classroom	1,500	
Library Workroom/Office	200	
Library Conference Room	240	
Library AV/Storage	200	
Library/Media Center Space Subtotal		
Administration		
Principal Office	200	
Asst Prin Office	120	
ISS Room	400	
Principal Secretary	120	
Registrar Office	120	
PEIMS/Attendance	120	
Reception/Waiting room	600	
Teacher's Lounge / Kitchen	800	
Workroom/Mail/Copy	300	
Workroom Storage	100	
Small Conference Room	150	
Large Conference Room	300	
Vault/Record Storage	200	
Clinic	300	
Restroom and Bath, Student	120	
Nurse's Office	120	
Office, Administration, Counselor	150	
Counselor/Testing Storage	80	
SRO Office	120	
Administration		
Food Service		
Cafeteria		
Stage	800	
Ramp	150	
Kitchen and Serving	2,600	
Locker/ Dressing	50	
Food Service Staff Restroom	50	
Walk-in Freezer	110	
Walk-in Cooler	175	
Warewashing	230	
Dry Food Storage	290	
Child Nutrition Manager's Office	75	
Table and Chair Storage	250	
Custodial/Utility Closet	90	
Food Service Space Subtotal		
Service/Support		
MDF Room	120	
IDF Room	80	
General Receiving	300	
Custodial Closet	50	
Electrical Closet	100	
Fire Riser	100	
Mechanical Room	140	
Main Electrical Room	200	
Electrical Distribution Rooms	100	
Boiler Room	150	
Custodian Office/Receiving	200	
Storage Outside	200	

Qualitative/Innovative Space Practices

- 1:1 Device Program: Every elementary student receives a district-issued device—enabling access to digital textbooks, learning platforms like Seesaw (PK–2) and Google Classroom (3–5), plus resources like Britannica School, Desmos, EdPuzzle, and Pear Deck. The district also supports families lacking internet access by offering home hotspot checkout. For PreK-Grade 1, iPads are designated for classroom use. Grades 2-8, Chromebooks or laptops are designated for classroom use. Students in Grades 9-12 will receive Chromebooks or laptops.
- Technology Integration & the 4 Cs: The district's technology plan emphasizes that through tech integration, teachers can foster differentiation, personalization, and infusion of the four Cs—Critical Thinking, Communication, Collaboration, Creativity. The plan includes rubrics for teacher and student behaviors across these competencies.
- Nurturing Early Structured Teaching (NEST): program focused on fostering early communication in a highly-structured teaching environment. NEST instructional programming will focus on "ready-to-learn" or pre- academic skills needed to be successful in a full day instructional environment (such as joint attention, turn taking, tolerance, classroom behavior, responding to interruptions in routine, and early academic readiness skills).
- Early Childhood Special Education (ECSE): provides educational and support services for children ages 3 to 5 with identified delays in one or more of the five developmental areas. These developmental areas are: motor, social/emotional, self-help, communication, and pre-academic. The ECSE classrooms in DeSoto ISD support and teach developmental skills through active play.
- B.A.S.E. (Behavior, Academic, Social, Enhancement) targeted instruction and intervention in one or more particular areas to help the scholar access the general curriculum. These scholars may be a grade level or two behind academically, require check-in or check-out, daily social skills, a cool down spot, but require minimal support for a majority of their day. The BASE service is documented as a pull- out service; minutes are documented for each grading period.
- STRIVES: classes are communication classes designed to provide a highly structured instructional program for scholars with an Autism Spectrum Disorder, or other disorder(s) whose academic, communication, and behavioral needs cannot be met in other settings. The focus of the STRIVES class is to provide class instruction with the following features: A verbal language (behavioral) approach to language acquisition (assumes scholars do not acquire language "incidentally" i.e., just by being around others); A high degree of classroom structure – physical, academic, and behavioral;

Emphasis on the development of effective communication skills through specialized, direct instruction based on the principles of applied behavior analysis and Skinner's analysis of verbal behavior.

- The DeSoto Promise in Practice: Rooted in principles like excelling, belonging, dignity, and making a difference, the Promise extends into elementary experiences. A standout example is The Male Leadership Academy at West Middle School. It focuses on helping young men develop skills and confidence to become successful leaders in their school, community, and lives.

Operational Considerations

- Elementary School
    - Adjacencies: Grades (K–5) located on first level. Grades can be split by K-2 and 3-5 when multi-level floor plans are provided
    - Circulation: Pod classroom arrangement, wide corridors, student display areas, and collaborative spaces.
    - Outdoor Access: Direct classroom-pod access to playgrounds and outdoor learning areas.
    - Traffic Management: Safe student drop-off/pick-up loops separate from bus and staff parking.
- Middle School
    - Larger cafeterias with flexible seating and quick-service serving lines.
    - Separate bus vs. parent traffic zones; safe pedestrian access for walkers.
    - Shared spaces (gyms, auditoriums) designed to support after-hours community use. Two gyms standard, with locker rooms sized for PE and UIL teams.
    - Band, choir, and orchestra areas buffered for acoustics, with dedicated storage.
    - Labs (science, STEM, CTE exploratory) grouped strategically near core classrooms.
- High School
    - Facilities must handle 2,000–3,000+ student populations.
    - Acoustically isolated band halls, black box theaters, and performance stages.
    - Traffic management: multiple lots/zones for staff, student drivers, parents, and buses.
    - Flexible scheduling spaces (collaboration commons, multipurpose areas) to align with blended and project-based instruction.
    - Traditional campuses integrating more flex labs and dual-credit classrooms.

Sustainability & Infrastructure

- Energy-efficient HVAC and daylighting strategies when feasible.
- Use of durable, low-maintenance materials.
- Native landscapes with an opportunity for outdoor learning.
- Robust wireless infrastructure for flexible tech deployment.
- Indoor air quality systems designed for health and wellness.

Approval & Review

- TEA Compliance Method and Flexibility Level
    - DeSoto ISD has approved the Quantitative Method for all new construction projects related to the 2025 School Bond to satisfy the requirement of section §61.1040.(H).
        - Method aligns more closely with function and use of existing campus.
    - DeSoto ISD has approved Flexibility Level 2 (L2) for all new construction projects related to the 2025 School Bond to satisfy the requirement of section §61.1040.(H) (2).
        - Single, fixed teacher presentation space; compact organization of spaces makes access to outdoor space limited and challenging, but outdoor spaces may be visible from classrooms; furniture includes detached student desk/chair with an expectation of very infrequent rearrangement; moderate multipurpose functionality for walls with no capability of reconfiguration; teacher-centric digital instruction with moderate access to mobile devices.
- This document, approved by the Board of Trustees, reflects DeSoto ISD's commitment to the DeSoto Promise and ensures that every campus designed under these specifications honors each child's uniqueness, respect, and capacity for success.
- Approved by Board of Trustees: 5/26/2026
- Review & Update Cycle: Every 5 years per TEA requirements.

Ed Specs Questionnaire

(For Future use by DeSoto *ISD During Development and Review)*

To ensure these Educational Specifications are **comprehensive, compliant, and aligned with district priorities**, the following guiding questions should be addressed:

A. Mission, Vision, and Instructional Philosophy

- How do these facilities reflect DeSoto ISD's **mission, vision, and The DeSoto Promise**?
- In what ways will facilities promote **belonging, dignity, and equity** for every student?
- How will spaces support both **academic rigor** and **social-emotional learning**?

B. Student Capacity and Growth

- What is the **maximum enrollment capacity** for the campus, and what are future demographic projections?
- Are facilities designed to expand or adapt for **growth over time**?
- How will the district eliminate reliance on **portable classrooms** through these specifications?

C. Safety and Security

- How are elements of the **Multi-Hazard Emergency Operations Plan (TEC §37.108)** integrated into design?
- Where will **ICC-500-rated storm shelters** be located, and how will they serve the community?
- How will the main entrance provide **secure, welcoming access** for students, families, and staff?

D. Inclusive Design

- How will facilities ensure **universal accessibility** for students of all abilities?
- Are there **sensory-friendly, restorative spaces** for students needing emotional regulation?
- How will facilities support **bilingual learners, SPED, and dyslexia intervention**?

E. Instructional and Support Spaces

- Do classrooms meet TEA's **quantitative minimums** for size and capacity?
- Where will **collaborative learning zones** and **breakout spaces** be located?
- How will **fine arts, STEM, and CTE labs** be integrated to support innovation?
- Are libraries/media centers designed as **flexible learning hubs** with digital access?

F. Technology and Infrastructure

- How will facilities support Desoto ISD's **1:1 device program** and digital learning tools?
- Are there adequate **power, charging, and wireless systems** in all learning areas?
- How will infrastructure support **future technology growth**?

G. Operations and Logistics

- Are traffic patterns (bus vs. parent drop-off) **safe and efficient**?
- Does the cafeteria/commons seat students in a **reasonable number of lunch waves**?
- How will the facility accommodate **community events** after hours?
- What **maintenance and custodial spaces** are required for efficient operations?

H. Sustainability

- How does the design maximize **natural light and energy efficiency**?
- What opportunities exist for **outdoor learning and green spaces**?
- Are materials and systems chosen for **durability and reduced long-term cost**?

I. Long-Range and Flexibility Considerations

- What **TEA Flexibility Level** (1, 2, or 3) is the district selecting, and why?
- How will designs remain **adaptable** for future instructional practices?
- Educational Specifications to be reviewed and updated at least every 5 years upon trigger events, with Boad review process.

DESOTO INDEPENDENT SCHOOL DISTRICT
SCHOOL TECHNICAL DESIGN GUIDELINE

09/18/2026 – ISSUANCE

TECHNICAL DESIGN SPECIFICATIONS

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NOTE TO THE ARCHITECT | ENGINEER

These technical design guidelines have been prepared for your thorough review and application. You will find that the material presented will answer many questions that you and your consultants might have. Generally, all architects and engineers (A/E's) are expected to adhere to these Guidelines; however, it is not intended that they limit the application of the professional's knowledge, experience, innovative design, or that they replace the normal thought process. The Architect and Engineer is still responsible for executing the work within the professional standard of care. In the event of conflict with building code or building standard, the building code shall govern, but the concern shall be brought to the attention of the owner for awareness. If you wish to request deviations from these guidelines, a letter to the Owner stating your request for each specific change is required. Each deviation must be approved by the district prior to the implementation of the change to the project.

SECTION A - DOCUMENT FORMAT

A.1 CAD (Computer Assisted Drafting)

A. A consideration in the selection of all architect and engineer consultants for the design of buildings and other facilities for the district will be the consultant has the capability to produce the drawings on a BIM/CAD system.

B. At the close of the project, the format for "as-built-drawings" and close out documentation will be searchable PDF files. The district will be provided with a copy of the final CAD drawings in DWG format including all font files used to produce the original drawings. If the fonts do not automatically plot the same size and readable style within the Owner's AutoCAD software, then an equivalent and compatible font file shall be substituted. The Architect's seal on the drawings are not required, and may list "not for construction"

C. A complete set of close out drawings in searchable .pdf format, and a complete set of all close- outs both in paper form in appropriately sized and labeled binders, and a copy of all close out documentation in searchable .pdf format. I

D. For purposes of ordering furniture, the Architect shall provide the Owner with architectural floor plans. These shall be provided at the beginning of construction. Provide architectural floor plans with at least two additional layers. One layer shall include all Contractor furnished equipment and furniture. The other layer shall include all Owner furnished equipment and furniture.

E. BIM files: the owner may request the use of Building information files. If such request is made and files are available, the A/E shall provide the files, files provided may be scrubbed of proprietary information and standardized into an ICF format.

A.2 Design Final & Construction Set

A. When Construction is completed, the architect shall compile the Drawings and Specifications into a "record drawing" package. This shall include all sheet revisions do the drawing set along with any updated postings to the Specifications. These documents shall be turned into the owner in PDF format upon completion of construction during the closeout phase.

B. A/E is expected to maintain a current "construction field set" as the construction progresses and shall not wait until the end of construction to update changes or revisions.

SECTION B - GENERAL CONSIDERATIONS

B.1 General Considerations

A. These guidelines have been developed to assist the Architect/Engineer in the development of a quality project in a consistent, efficient and timely manner, incorporating experiences and lessons learned from past building improvement programs. These Design Guidelines have been developed to assist in communicating the ISD's desires and requirements regarding new construction, additions, and renovations. Application of the Guidelines to renovation projects will require professional skill and judgment and may require modification with written concurrence of the District Facilities Department on a project-by-project basis.

B. The guidelines are not intended to unduly limit or control opportunities for innovative design but rather to assist the project professionals in understanding certain planning requirements, design criteria, and concern regarding reduction of energy consumption. The district encourages architects and engineers to recommend and provide information regarding energy conservation and building envelope improvements, including HVAC and lighting.

C. Nevertheless, whenever the design of facilities varies from the requirements and considerations contained in the Guidelines, the Architect/Engineer shall inform the Owner and submit a Design Waiver. The design team shall analyze safety, cost, schedule, and operational impacts prior to filling out the waiver form. The Owner will approve or disapprove the variance. Refer to standardized waiver form attached.

D. DESOTO ISD will conduct periodic reviews for the purpose of determining compliance with DESOTO ISD criteria, guidelines, and instructions. All critical stages of construction will be reviewed, approved and released by the appropriate DeSoto ISD master tradesman prior to the progression of the next stage of construction. All installations will meet the approval of appropriate DESOTO ISD facilities departments regardless of the outcome of the city inspections.

E. A standard full color project sign will be provided as part of the bid price for all major construction projects. Size shall be approximately 4’x8’ in a type acceptable for exterior use.

F. Acceptable manufacturers for various components will be noted for certain products as directed by DESOTO ISD and/or these specifications. Except where noted “no substitutions”, these acceptable manufacturers are identified to establish a standard of quality for the DESOTO ISD’s facilities. The architect and consultants will provide in Division 1 of the project manual the A/E’s provisions for determining equal products that are acceptable and equality will be established prior to the stated bid date. The Project Architect and/or the Project Engineer will specify any item or component not shown in the list.

G. To conform to environmental compliance, all products specified and incorporated in projects shall be "asbestos free”; paint and potable water plumbing will be “lead free." All pressurized systems and containerized systems shall be C.F.C. free.

H. The Architect / Engineer will require a statement from the Contractor which is to be submitted prior to substantial completion and prior to the district occupying the facility stating that, to the best of his knowledge, the project was constructed with products and materials which are “asbestos free” and “lead free.” This statement shall be accompanied by SDS documents as applicable. Asbestos free certification of building materials, specifications, and drawings will be provided to the district.

I. The Architect will certify that specifications and building materials incorporated in the design and construction of the facility are both asbestos and lead free.

J. Landscape and Irrigation Documents for Construction will be sealed and stamped by the Professional A/E.

K. Substantial Completion: The Contractor will prepare and submit a list of deficiency items as required by Paragraph 9.8.2 of the General Conditions. In addition to the deficiency report, the Contractor will provide copies of the complete TAB (Commissioning) report and verification that all repairs have been made and that the systems are operational. This list will be submitted to the Architect a minimum of 7 days prior to the scheduled walk through. On the scheduled date of the walk through and after receipt of the deficiency list (punch list) the Architect will inspect the project to determine the status of completion

L. All waste lines will be inspected by camera in the presence of a DESOTO ISD representative prior to substantial completion. At the conclusion of satisfactory camera review, the contractor will smoke test the wastewater system in the presence of the construction project supervisor and representatives from the district. Failed smoke test will be repeated after correction and repairs are made, again in the presence of the construction program supervisor and representatives from the district.

M. The design team shall include workmanship and installation qualities in the project specifications.

SECTION C - ARCHITECTURAL CRITERIA

C.1 Considerations during Early Design Phase:

A. The following outlines considerations, which will be included in early project analysis presentations. Development of building and site options will be presented in descending order of assumed priority.

B. General Program Analysis

1. Recommended relationships of new components to each other.
2. Recommended relationship of new components to existing ones.
3. Problems in existing facilities in descending order of priority.
4. Historic significance of existing structures that may be appropriate.

C. Site Analysis of Existing Conditions

1. For school additions, consider sprinkler (fire) vs. horizontal and vertical access, fire lane, and hydrant.
2. Traffic (patterns, noise, danger, density of school site); special considerations regarding safety of children; adequate parking.
3. Adequate service area.
4. Location and size of existing utilities.
5. Relationship of school to surrounding neighborhood.
6. Setback and easement restrictions.
7. Site utilization during construction (contractor considerations, e.g., fence, access, etc.) temporary building location/relocation.
8. Location and size of all existing permanent and transportable structures.
9. Platting and zoning requirements.
10. Landscaping requirements.

D. Building Design

1. Judicious use of glass will be considered evaluating energy efficiency against natural lighting. Natural daylighting is encouraged where energy efficiency can be

REQUEST FOR WAIVER

DeSoto ISD

PROJECT: _____

SUBMISSION: _____ DATE: _____

PROJECT TYPE: ES ☐ MS ☐ HS ☐ NEW ☐ ADD ☐ REN ☐

REQUESTED BY: ARCH ☐ PM ☐ DeSoto ISD ☐

TYPE OF WAIVER: ED SPECS ☐ TDG'S ☐

DESCRIPTION: _____

_____

_____

_____

_____

JUSTIFICATION: _____

_____

_____

_____

_____

FINANCIAL IMPACT: _____

REQUESTED BY: _____
Name of Firm

Name & Title: _____

Signature: _____ Date: _____

AUTHORITY:

Program Manager: _____
Name / Firm Signature Date

Desoto ISD Representative: _____
Name Signature Date

Form Revised on 08/28/2026

maintained or gained through the reduction of electrical lighting. Where possible all standard classrooms should have access to natural light.

2. Design is important to the district, so such items as mechanical equipment, trash dumpsters, etc. will be placed out of sight as much as possible. Use of parapet walls must be considered during the design process. Verify additional screening requirements with the local authority having jurisdiction. Parapet walls will be designed with openings for ladder access and consideration for the evacuation of sewer gases.
3. Prioritize the use of durable building materials that are low maintenance and highly durable with impact and abrasion resistance.

SECTION D - STRUCTURAL CRITERIA

D.1 General Considerations

A. It is not the intent of these guidelines to limit the application of the professionals' knowledge, experience or innovative design. However structural design involving other than conventional foundation and building framing for any school must be reviewed and approved by DESOTO ISD.

B. Use of pre-cast structural concrete, pre-stressed or post tensioned concrete, and systems utilizing excessive spans, or components/procedures unusual to the local building trades will need to be reviewed with and approved by DESOTO ISD.

C. Design loading and deflection criteria shall, as a minimum, comply with requirements of the latest edition of the applicable building code and account for current and future probable loads for the design life of the structure.

D. Structural steel members will be designed in accordance with A.I.S.C. specifications for Design, Fabrication and Erection of Structural Steel for Buildings, the latest edition.

E. Reinforced concrete members will be designed in accordance with the American Concrete Institute, A.C.I. 318.

F. Where conflicts occur between the Building Code and the A.I.S.C/A.C.I. specifications, the Building Code will govern.

G. All roofs will be designed with sufficient slope or camber to assure adequate drainage, taking into account ultimate long term deflection. Structure will be designed with a slope of 1/4" per foot or as appropriate to the roofing system proposed; roof slope will not be provided merely by sloped insulation.

H. Very careful consideration will be given to the effects of the expansive soils found in the DeSoto/ Glenn Heights area. Foundation design will be based on the Geotechnical Engineer's Report and the professional judgment of the design team.

I. Note: Areas within the District may have layers of hard rock and may require larger drilling equipment and/or specialized bits.

J. In designing additions to existing schools, consider the potential differential settlement between the buildings; particularly where new floors are adjacent to existing ones.

K. The structural engineer must carefully coordinate and account for the potential effect of anticipated deflection of the structural system as related to connection of non-structural walls, partitions and mechanical equipment. Minimize deflections.

L. The structural engineer will coordinate with the architectural and mechanical requirements of the project to assure adequate clearances, support, and proper dimensioning. Close attention will be given to the structural requirement imposed by mechanical equipment for openings, penetration of structural members, inertia pads,

equipment weights, vibration and water piping of all types. Provide space in hallways for fan-powered mixing boxes and all piping.

M. The structural engineer will review and coordinate with the architectural drawings to assure provision has been made, as required, for lintels, shelf angles, floor depressions including those for refrigerator/freezer units, water proofing, miscellaneous framing members and anchors, properly sized to carry the intended load.

N. Consideration will be given to planned concentrated loads.

O. Structural Engineer will review all masonry connections to the structural frame and design for appropriate wind and lateral loads in attachment to structural frame of the building. Design all masonry panels and parapets for horizontal and vertical reinforcing, and review the architect's standard detailing for correct anchorage. The DESOTO ISD considers assembly areas, including gymnasiums, to be essential facilities. Consider in design whether code minimum loads are adequate, and increase them where appropriate. The architect and engineer will discuss increases with the Owner for approval and coordination.

P. Do not use hanging or swing connections for beam ends relying on a single fastener or pin at expansion joints.

Q. The preferred ground floor system for new buildings is a structurally suspended floor slab over void cartons with under-floor crawl spaces used at select group restrooms and at the kitchen. A slab-on-grade will be considered as an alternate only with approval from DeSoto ISD.

D.2 Structural Design Philosophy

A. DeSoto ISD requires structural systems that are safe, economical, durable, maintainable, and adaptable to future changes in use. The following principles shall guide all structural design decisions:

1. Structural designs shall prioritize simplicity, economy of construction, and buildability. Innovative or complex structural systems shall be considered only when the end product is appropriate for school use and the cost is comparable to conventional structural systems, and must receive written approval from DeSoto ISD prior to Design Development.
2. Proprietary or patented structural systems shall be avoided unless no practical alternative exists. Any proprietary system must be approved in writing by DeSoto ISD.
3. Column-and-beam structural systems are preferred over load-bearing wall systems. Non-structural interior walls are preferred to allow future floor plan modifications without structural intervention.
6. Pre-Engineered Structural Framing Systems (metal building systems) shall be submitted to DeSoto ISD for written review and approval before use in any facility.
7. Structural member sizes and pier and column grid dimensions shall be standardized to the greatest practical extent to facilitate future additions and modifications.
8. The structural engineer shall review architectural, mechanical, electrical, and plumbing requirements to ensure that adequate structural support is provided for all equipment and special loading conditions.

D.3 Design Loading Criteria – Required information on Structural Drawings

A. The following design criteria shall be shown on the first sheet of the structural drawings for every project. This information constitutes the official design basis of record for the facility.

1. Governing building code and edition, including all local amendments.
2. ASCE 7 edition used for design.

3. Risk Category per IBC (school buildings shall be classified as Risk Category III).
4. Design wind speed (3-second gust), Vult, per ASCE 7 for the applicable Risk Category.
5. Wind Exposure Category.
6. Seismic Design Category.
7. Mapped spectral response accelerations Ss and S1.
8. All design floor live loads, listed by occupancy type (classrooms, corridors, gymnasiums, storage, mechanical rooms, etc.).
9. Roof live load.
10. Partition load allowance (minimum 15 psf for all occupied school areas).
11. Mechanical equipment superimposed dead loads, by roof zone.
12. Bearing strata for footings and/or piers, and allowable bearing capacities used for foundation design.
13. Required 28-day concrete compressive strength (f'c) for each concrete member classification.
14. ASTM specification and grade of reinforcing steel used for design.
15. ASTM specification and type of cement used in concrete mix designs, including type and maximum percentage of fly ash.
16. If steel frame: AISC edition used; ASTM specification and yield strength for each structural steel member type.
17. All Special Inspection and Special Testing requirements (refer to Section 03.7).
18. Notes regarding the maximum weight of construction equipment that is will be allowed to drive over the new or existing floors during construction.

D.4 Sustainability

A. Projects are not to be certified but utilize best practices in terms of sustainability within budget constraints.
B. Fly ash may be used as a supplementary cementitious material in concrete mixes. The specific type (ASTM C618 Type C or F) and maximum substitution percentage shall be coordinated with DeSoto ISD prior to Design Development and shall not exceed 25% by weight of cementitious material without written approval.
C. Recycled aggregate shall be used in concrete design mixes where practicable and where aggregate quality meets all applicable ASTM standards.
D. Curing compounds used on all school sites shall contain no more than 10% solvents.
E. Masonry units manufactured within 500 miles of the project site shall be given preference, all other selection criteria being equal.

D.5 Under-Floor Crawl Spaces

A. Structurally suspended floor slabs with under-floor crawl spaces are permissible in Group Restrooms and Kitchens for all new school buildings. This requirement addresses the expansive soil conditions prevalent in the DeSoto area and provides access for future utility modifications.
    1. Crawl spaces shall be placed at existing grade rather than excavated below existing grade. Excavation below existing grade shall only be performed where specifically required by the design and approved by DeSoto ISD.
    2. Minimum crawl space clear height: 36 inches measured at the bottom of the lowest beam or structural obstruction, with interior drains placed below finished floor as required.
    3. A concrete mud slab, minimum 3 inches thick, shall be installed throughout all crawl spaces.

4. Access to crawl spaces shall be provided by 3 ft x 3 ft aluminum floor hatches with ladders extending to the ground surface. No serviceable area within the crawl space shall be more than 150 ft from a floor hatch access point.
5. At least one pit location with 6 ft-0 in of clear head space shall be provided at each sump pit location. (Where are sumps required for drainage)
6. Concrete structure in the under-floor crawl space is preferred over composite slab and steel beams. Steel Joists are not acceptable for use in any crawl space.
7. The ground beneath the crawl space shall be contoured to provide positive drainage away from the perimeter grade beams toward interior collection areas. Provide low collection areas and gravel sumps. Connect interior crawl space drainage to the city drainage system where available and within a practical distance. Gravity drainage is preferred when possible.
8. Crawl spaces shall be ventilated. Natural ventilation is preferred, but mechanical ventilation is also acceptable with adequate coverage.
9. Crawl spaces shall be provided under kitchen and science laboratory areas at a minimum due to service needs.
10. To avoid interference with crawlspace utilities in areas of expansive soils, provide lime stabilization, select fill, or compaction beneath the crawl space as recommended by the Geotechnical Engineer where the potential for soil heaving or shrinkage is identified.

D.6 Slab-on-Grade

A. The use of slab-on-grade foundation systems for school buildings is generally an alternate if accepted by owner due to the expansive soil characteristics prevalent in the DeSoto area. Slab-on-grade construction shall not be used for school building areas without the following:
   1. Written approval from DeSoto ISD Construction Services prior to Design Development.
   2. A current project-specific Geotechnical Report with specific recommendations addressing slab-on-grade construction in expansive soils. The report shall accompany the written approval request.
   3. Specific design measures to address expansive soil conditions, as recommended by the Geotechnical Engineer.
   4. An approved Vapor Barrier System beneath all slab-on-grade construction.
   5. Slab-on-grade construction may be considered without a full approval process for isolated, lightly loaded non-occupied areas such as mechanical equipment pads, exterior covered walkway slabs, and similar limited applications, provided the geotechnical report specifically addresses those areas
   6. Slab-on-void is the preferred foundation system for school buildings

D.7 Delegated Design Requirements

A. Delegated design refers to the process by which the Engineer of Record assigns responsibility for the detailed structural design of specific elements to a specialty engineer retained by the manufacturer or fabricator.
   1. Items requiring delegated design shall be clearly identified on the structural drawings with a note stating that the item is a delegated design element and that sealed engineering calculations and drawings are required prior to fabrication.

B. Elements that may require delegated design include, but are not limited to:

1. Open-web steel joists and joist girders (designed per Steel Joist Institute standards).
2. Precast concrete structural elements (beams, columns, double-tees, hollow-core planks, wall panels).
3. Cold-formed metal framing systems used as primary structural elements.
4. Prefabricated metal stair assemblies and stair framing.
5. Pre-engineered metal building systems (if approved by DeSoto ISD).
6. Curtain wall and storefront structural framing systems.
7. Retractable and folding bleacher support systems.
8. Gymnasium backstop and overhead support structures.
9. Stage rigging and fly system structural supports.
10. Prefabricated canopy and shade structure framing systems.

C. All delegated design submittals shall meet the following requirements:
1. The delegated design engineer shall hold a current Professional Engineer license in the State of Texas.
2. Submittals shall include sealed engineering calculations; sealed shop drawings showing all dimensions, connections, loads, and design assumptions; and a written statement confirming compatibility with the overall structural system and the loads shown on the EOR drawings.
3. The EOR shall review and approve all delegated design submittals before fabrication or installation proceeds. The EOR's review stamp shall appear on all approved delegated design drawings.
4. The EOR is not relieved of overall structural responsibility. The EOR shall verify that all delegated design loads and reactions are consistent with the assumptions used in the design of the supporting structure.
5. The EOR shall identify all anticipated delegated design items at the 50% Construction Document stage and shall notify DeSoto ISD in writing of the full scope of delegated design on each project.

D.8 Future Expansion

A. The structural system shall be designed to allow for future changes in room function without structural modification wherever practical.

B. Where campus additions or expansions are anticipated, the structural engineer shall show future building expansion areas on the structural drawings and shall confirm that the structural grid, foundation type, and load paths are compatible with the planned additions.

C. All floor structural systems shall be designed for a minimum uniform live load of **100 psf,** regardless of the intended occupancy, to allow for future changes in room function without structural modification. Where the code-required live load for the intended occupancy exceeds **100 psf,** the code-required load shall govern. Submit a waiver request to DeSoto ISD if design deviation is required due to costs or other reasons.

DIVISION 01 -- GENERAL REQUIREMENTS

1.1 Advertisement for Construction Proposals

A. If requested, the Architect/Engineer shall assist in the Advertisement Requirements and schedule with DESOTO ISD to assure a minimum of two (2) advertisements in the DESOTO ISD selected newspaper on the days selected by the DESOTO ISD.

1.2 Evaluation Criteria

A. If requested, the Architect/Engineer shall assist in coordinating with DESOTO ISD the criteria requirements for the selection of the general contractor by the request for Competitive Sealed Proposals, or CMAR Proposals.

1.3 General Conditions/Supplementary Conditions

A. The general conditions for the contract shall be the DeSoto ISD Uniform General Conditions for Contracts. The supplementary conditions will be as written by DESOTO ISD and are to be reviewed and approved by the DESOTO ISD Attorney.

1.4 Summary of Work

A. Where a project involves renovation or addition to an existing facility, the Architect/Engineer is responsible for verification of all existing conditions within reason. This does not include destructive testing.

1.5 Owner Provided Documents

A. The geotechnical report will be requested by the Architect/Engineer as soon as possible to ensure the project moves forward in a timely manner. The proposal - agreement forms for the services - will be completed with available information and submitted to DESOTO ISD to secure the appropriate services.

B. DESOTO ISD is responsible for identifying any asbestos containing material in existing facilities. The district or the district's consultant will coordinate the abatement of any asbestos material discovered by the design team or during construction.

1.6 Submittals

A. Submittal procedures will be in accordance with the DESOTO ISD Guidelines and Procedures Section II of the DESOTO ISD Design Manual.

1. Architect shall provide appropriate requirements in the project manual requesting the following SDS sheets on materials of common concern.
2. SDS will be submitted to the District with the Close-Out Documents.
3. The architect will submit the following submittals to the DESOTO ISD for review for comments and/or approval. Submittals shall be reviewed and/or approved by the design professional prior to submitting one copy to DESOTO ISD. The specification sections include:
   a) Section 08 7100 - Door Hardware
   b) Section 10 1414 - Exterior Signage
   c) Section 10 1415 - Interior Signage
   d) Section 11 4000 - Foodservice Equipment
   e) Section 11 6643 - Interior Scoreboards
   f) Section 22 4000 - Plumbing Fixtures
   g) Section 23 7000 - Heating, Ventilating and Air Conditioning
   h) Section 23 9000 - DDC Energy Management System
   i) Section 26 5113 - Interior Lighting Fixtures, Lamps and Ballast
   j) Division 27 - Communications
   k) Division 28 - Electronic Safety and Security

1.7 Substitutions

A. Reference Section B - General Considerations and Supplementary Conditions to AIA-A201.

1.8 Construction Administration

A. Architect to provide field observation reports weekly.
B. Engineer teams shall attend monthly site visits.
C. Consultant team notification required prior to concealing MEP rough-ins, waterproofing systems, roof assemblies, and other critical building components requiring inspection/.

1.9 Close-out Documents

A. If a survey firm has used the CAD system, provide DESOTO ISD, in addition to other copies, a CD with AUTOCAD file, for use in DESOTO ISD CAD system, each drawing file will reference the sheet name in the electronic file name.
B. The Architect/Engineer shall assure the District that requirements for Warranties, Operation & Maintenance Manuals, Record Drawings, SDS documents, Attic Stock, etc. are clearly identified in the contract documents for District use. SDS sheets will be included in an individual binder. A complete electronic back-up of all SDS and close out documents will be provided electronically utilizing PDF files.
C. The following Closeout & Record Documents will be provided to the District upon completion of the project (but not pre-requisite to release of the retainage to the Contractor):
    1. From the Contractor:
        a) One (1) original hard copy of the project record drawings and project manual.
        b) One (1) USB/Digital copy of the project record drawings and project manual in Adobe “pdf” searchable format. The USB/Digital will be set up with each section of the specifications, and each drawing sheet indexed. The USB/Digital will be set up to allow editing.
        c) One (1) original hard copy of closeout documents designated by the district.
        d) One (1) USB/Digital copy of closeout documents designated by the district in Adobe “pdf” format.
        e) Certificate of Substantial Completion
        f) Final Change Order, if applicable (unused allowance credits, etc.)
        g) Final Application for Payment – figures to assume acceptance of Final C/O – no work or retention outstanding
        h) Consent of Surety to Final Payment
        i) Municipality Certificate of Occupancy for building
        j) Contractor’s Affidavit of Release of Liens
        k) Contractor’s Confirmation of General Guarantee
        l) Subcontractor and Material Supplier’s Release and Guarantee – All blanks completed – notarized for all subcontractors and suppliers on original List of Subcontractors
        m) Letter from Contractor advising which subcontractors or suppliers differ from originally submitted List of Subcontractors, if any, with release/guarantees, as applicable
        n) Transmittal, Listing Keys turned over to school Principal with signature and dated
        o) Letter from Architect that all Punch List items have been completed to his satisfaction and recommendation regarding liquidated damages, if applicable
        p) Operating Instructions and Maintenance Manuals for all Equipment, including but not limited to Landscape Irrigation, Mechanical, Electrical, Plumbing, and

Kitchen. All stamped by consultant or engineer as in accordance with specifications.
q) Architectural and “M.E.P.” as-built drawings with field changes marked
r) HVAC Control Drawings
s) Final HVAC Test and Balance Report
t) Letter from Contractor certifying that no asbestos-containing materials were installed in the Project
u) Submission from Contractor of all SDS (Material Safety Data Sheets) documents, as applicable.

2. From the Architect:
a) One copy of the “record drawings” from information received from the Contractor, submitted in digital format (DWG) to DESOTO ISD Facilities
b) a statement that the project complies with all requirements of 19 T.A.C. §61.1036 and the requirements of Texas Government Code Chapter 469, the Elimination of Architectural Barriers Administrative Rules (16 Texas Administrative Code Chapter 68), the Texas Accessibility Standards (T.A.S.), the Americans with Disabilities Act, 42 U.S.C. § 12181 et seq., and its corresponding regulations in 28 C.F.R. 36.101 et seq.

1.10 Substantial Completion
- A. Operational training of all systems and equipment is required for District Staff.
- B. Two sessions are required. The first session shall include district maintenance personnel and shall be completed prior to substantial completion being executed. The second session should be provided once the final facility staff is available.
- C. Training shall be provided by the contractor for operation of the tornado shelter when applicable.

1.11 Pay Applications
- A. Project Manual shall indicate a 5% Retainage to be used for DESOTO ISD projects and indicated as such in the executed AIA, A101 Agreement (5.1.6). This section of the Agreement is to be filled in prior to inserting the AIA, A101 Document into the construction specifications for DESOTO ISD projects. Additional retainage should be considered for landscape areas.
- B. A/E Team shall review draft pay applications within a timely manner and provide comments or recommendations typically within 7 days.

1.12 Tree Removal and Plumbing
- A. General Requirements
  1. Tree felling, removal and grinding of stump per ISA (International Society of Arboriculture) Certified Arborist.

1.13 Tree Protection and Care
- A. General Requirements
  1. Inventory of trees to remain: survey location, species, and condition.
  2. Tree protection fencing: orange safety or chain link at minimum four (4) foot height with posts and no gate for entry to protect root zone from compaction

1.14 Root Pruning
- A. General Requirements

1. Root pruning of trees to remain using air spade technology and pruning of roots over one (1) inch in size per ISA (International Society of Arboriculture) Certified Arborist.
2. Mulching or soil placed back into trench to allow offshoot roots to grow.

1.15 Professional Licensing

A. General Requirements

1. All structural components of DeSoto ISD facilities shall be designed by a structural engineer licensed to practice engineering in the State of Texas. All structural drawings shall bear the seal and signature of the Engineer of Record.
2. Geotechnical engineering services shall be performed by a geotechnical engineer licensed to practice in the State of Texas. The geotechnical report shall bear the geotechnical engineer's seal.
3. All construction materials testing and special inspection services shall be performed by a firm registered by the State of Texas to provide construction materials engineering services, in compliance with ASTM E329 – Standard Practice for Agencies Engaged in Construction Inspection, Testing, or Special Inspection. Testing services shall be performed under the direct supervision of a licensed professional engineer as required by the Texas Engineering Practices Act.
4. Delegated design engineers (see Section 01.7) shall hold a current Professional Engineer license in the State of Texas.

1.16 Construction Phasing

A. General Requirements

1. Architect is to indicate in the Construction Site Plan the phasing and/or specific sequencing of construction that will be required. Include a traffic control and mitigation plan for the construction period that includes motor vehicles, bicycles, and pedestrians.
2. Include preliminary phasing schedules, parking and circulation plans, coordination of student arrival and dismissal operations.
3. Document approval from campus administration prior to the start of construction.

DIVISION 02 -- EXISTING CONDITIONS

2.1 Demolition

A. All demolition shall be performed under the guideline of the current edition of the 29 CFR 1926 - U.S. Occupational Safety and Health Standards and NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

B. Included in the demolition proposal, Contractor will provide a written declaration of items that will be salvaged from the site. Each item shall be itemized and a monetary value assigned. Credit value of salvaged items shall be included in calculation of proposal. Declaration shall be reviewed by the Owner to determine that the declaration complies with state requirements and local Board policy in regard to disposing of public property.

C. All items called for on the drawings to be salvaged, removed and relocated shall be inventoried, removed and stored until such time as they are to be installed in their new location. The inventory list will be given to the Owner and will include an itemized quantities, descriptions and condition of each item. These items are considered to be in good operating condition at the time the contract is signed and will remain the property of Owner. These items will be properly protected by the contractor and removed by him,

PROJECT CLOSEOUT CHECKLIST

PROJECT: _____

ARCHITECT: _____

CONTRACTOR: _____

The following items are required to be complete and/or resolved prior to submitting the agenda item for Final Change Order and Board Acceptance of the Project.

Initials/Date		File Original	File Copy
	Certificate of Substantial Completion covering all work, Punch List attached. Submit 2 originals to Director for processing. **Date of Substantial Completion:**	Certificate only to Contract File	Certificate only to Payment File Certificate w/ punch list to Doc File
	Complete Architect/Engineer Punch List issued to GC	Transmittal to Doc File	
	Temporary Facilities, trash and construction debris removed from site.		
	HVAC filters replaced, strainers cleaned	GC Memo to Doc File	
	Required training completed.	Memo or minutes to Doc File	
	All Operation & Maintenance manuals submitted to the Architect for review	Transmittal to Doc File	
	All Record Documents (drawings and specifications) submitted to the Architect for review.	Transmittal to Doc File	
	Installation Drawings for Fire Alarm, Fire Sprinkler, and Fire Suppression submitted to the Architect for review	Transmittal to Doc File	
	All Guarantees & Warranties submitted to the Architect for review.	Transmittal to Doc File	
	Final Tests and Inspections		
	City Backflow Inspection	Compliance Officer	Doc File
	Gas Test		Doc File
	Boiler Test		Doc File
	Engineering Dept. requirements satisfied		Doc File
	TDLR Inspection requested by Architect		Doc File
	Initial Test & Balance Report issued to GC		
	Allowances Reconciled, Final AEA complete	Doc File	
	Final Cost Summary Log received from Architect, includes listing of all Allowance and Change Orders	E Doc File	Doc File

	Final Change Order Summary attached, three originals executed by Architect and Contractor	To District for processing	Doc File (CA)
	Letter from Architect stating all cost issues are addressed and recommend approval of Final Change Order, that the Record Documents, O&M Manuals and Warranties have been received and are being reviewed, and that the Architect recommend the Board accept the Project.	To District for processing	Doc File (CA)
	Copy of this page with all items acknowledged	To District for processing	Doc File (CA)

The checklist has been reviewed and all items are acknowledged or noted as not applicable. Print out the completed list with all items initialed and dated by CA and recommended by Manager; provide with Final Change Order and Architect's letter and place copy in Doc. File.

Construction Manager: Name Signature Date

Form Revised on 08/28/2026

PROJECT CLOSEOUT CHECKLIST

PROJECT: _____

ARCHITECT: _____

CONTRACTOR: _____

The following items are required to be complete and/or resolved prior to releasing the Final Application and Certificate for Payment.

Initials/Date		File Original	File Copy
	All Operation & Maintenance manuals reviewed and accepted by Architect.	CA Distribute	Transmittal only in Doc File
	All Record Documents reviewed and accepted by Architect.	CA Distribute	Transmittal only in Doc File
	All Guarantees & Warranties reviewed and accepted by Architect	CA Distribute	
	Installation Drawings for Fire Alarm, Fire Sprinkler and Fire Suppression reviewed and accepted by Architect.	Transmittal to Doc File	Record Documents
	Required attic stock	Transmittal to Doc File	
	Final Test & Balance Report with discrepancies corrected.	Doc File	
	Transmittal for Record Documents and Warranties to Facility Maintenance	Doc File	
	Final TDLR Report showing compliance or Final Report with documents indicating plan for work outside the scope of work in the construction contract.	Accessibility File	Doc File
	Certificate of Occupancy (Final Inspection) received/Permit closed	Doc File	
	Final Plat - Approved, Signed and Filed with County		
	All Punch Lists fully cleared	Doc File	
	Final Change Order approved by the Board and executed	Contract File	Doc File
	Final Application and Certificate for Payment, showing Final Change Order if applicable and certified by Architect	Payment File	Doc File
	Contractors Affidavit of Payments of Debts and Claims (AIA G706)	Contract File	Doc File
	Contractors Affidavit of Release of Liens (AIA G706) or individual Lien Releases	Contract File	Doc File
	General Contractors Final Release of Liens	Contract File	Doc File
	Consent of Surety to Final Payment (AIA G707)	Contract File	Doc File

	Letter from Architect stating all requirements of the Contract for Construction are complete and recommends Final Payment	Contract File	Doc File
	Sub-Contractors Final Release of Liens	Doc File	
	Provide Originals District for processing: Final Application of Certificate for Payment, Contractors Affidavit of Payments of Debts and Claims, Contractors Affidavit of Release of Liens, General Contractors Final Release of Liens, Consent of Surety to Final Payment, Architect's letter and copy of this checklist		
	TEA Certification of Project Compliance	Compliance File	Doc File
	Notice to Risk Management		
	Final Payment to General Contractor Approved	Payment File	

The checklist has been reviewed and all items are acknowledged or noted as not applicable. Print out the completed list with all items initialed and dated by CA and recommended by Manager; provide with Final Change Order and Architect's letter and place copy in Doc. File.

Construction Manager: Name Signature Date

Form Revised on 08/28/2026

complete, including all appurtenances and reinstalled in their new location in good working order with any modifications called for by the drawings.

2.2 Existing Conditions

A. On renovations or addition projects, require that the contractor document all existing conditions prior to beginning work. Contractor is also responsible for surveying existing building systems prior to the work and providing a report of such conditions and any deficiencies.

2.3 Geotechnical Investigations

A. DeSoto ISD shall procure the geotechnical investigation directly for all new school construction projects. The A/E shall assist DeSoto ISD in preparing the scope of geotechnical services and in recommending boring locations and quantities.
   1. A/E shall ensure that the geotechnical report includes all sections relevant to the project, including but not limited to:
      a. Design parameters for foundations for columns and load-bearing walls.
      b. Design parameters for retaining walls and basement walls
      c. Recommendations for improvement of soil under building slabs.
      d. Recommendations for improvement of soils under paving and driveways.
      e. Recommendations for lightly loaded structures (playgrounds, site lighting, etc.)
      f. PVR calculations and minimum height of separation between soil and grade beams, walls, or structured slabs.
   2. The geotechnical investigation shall be performed by a geotechnical engineer licensed to practice in the State of Texas. The geotechnical report shall bear the engineer's seal.
   3. Geotechnical engineering investigation reports are to be requested by the Architect immediately after notice to proceed. Architect to assist in suggesting boring locations and quantities. The establishment of boring depth and the selection of engineering tests are the responsibility of the geotechnical engineer, with consultation of the A/E.
   4. Logs of all geotechnical test borings shall be included in the structural drawings or project specifications and shall be available to the A/E and all bidders.
   5. Foundation design shall be based on the Geotechnical Engineer's recommendations. The Structural Engineer of Record shall review the geotechnical report and confirm that the proposed foundation system is consistent with the report's recommendations.
   6. For building additions: the A/E shall promptly request a supplemental geotechnical investigation upon notice to proceed. The A/E shall specifically consider and address the potential for differential settlement between new construction and existing construction where floor slabs or foundations are contiguous.

2.4 Expansive Soils

A. Structural designs shall specifically address the effects of expansive soils:
   1. The Structural Engineer of Record shall review the geotechnical report for evidence of expansive soils and shall confirm that the foundation system and floor construction are appropriate for the measured swell pressures and plasticity indices.
   2. Structurally suspended floor slabs with under-floor crawl spaces may be required as the primary strategy for managing expansive soils in occupied building areas (see Section 01.5).
   3. Where the Geotechnical Report identifies hydrostatic pressure conditions: provide keyways at all construction joints, continuous water stops, and continuous waterproofing membranes at all below-grade concrete elements.

4. Provide a continuous waterproofing membrane at all foundation walls and retaining walls that are exposed to soil.
5. Provide a continuous vapor retarder membrane, minimum 15 mil thickness, at the underside of all floor slabs where floor finishes are sensitive to moisture vapor transmission.
6. Document the 100-year floodplain boundary and all soil conditions identified in the geotechnical report on the civil engineering drawings.

DIVISION 03 -- CONCRETE

3.1 Reference

A. Applicable Standards

1. ACI 318 – Building Code Requirements for Structural Concrete and Commentary, current edition.
2. ACI 301 – Specifications for Structural Concrete.
3. ACI 304 – Guide for Measuring, Mixing, Transporting, and Placing Concrete.
4. ACI 305 – Specification for Hot Weather Concreting. (Note: Given the DFW climate, hot weather concreting procedures shall be specified in all project specifications.)
5. ACI 306 – Specification for Cold Weather Concreting.
6. ACI 347 – Guide to Formwork for Concrete.

3.2 General

A. Acceptable concrete structural systems: cast-in-place (CIP) concrete; precast concrete.

B. Tilt-wall construction is not acceptable without prior approval.

C. Structural components or construction procedures that are unusual to the local DFW building trades require written approval from DeSoto ISD.

D. Stoops outside all exterior doors shall be part of the structural system for the building, extending a minimum of 5 ft-0 in outside of the building and sloped at 1/8 inch per foot away from the building. Include a trench drain the full width of the door opening.

E. The A/E shall coordinate all gymnasium equipment embedment locations and structural loads with the Structural Engineer of Record prior to the permit set. Embedment details shall be shown on the structural drawings.

F. Volleyball post anchors shall be embedded into the concrete floor slab per the manufacturer's requirements. Provide holes for a minimum of three floor-mounted volleyball systems where gym is sized to permit.

G. Retractable bleacher support reactions shall be included in the structural design and shall be coordinated with the floor and wall structural systems.

H. All embedments shall be installed prior to concrete slab placement. The Engineer of Record shall approve all embedment details prior to placement.

I. The top surface of all exposed exterior concrete shall be sloped for positive drainage. Include drip grooves on the underside of all cantilevered leading edges.

J. At tornado storm shelter roof areas: when concrete structure is utilized on the roof, use normal weight concrete with a broom finish to enhance the bond with the roof system. Do not use vapor barriers, curing agents, or sealing agents that will impact the adhesive bond of roofing materials to the concrete surface.

3.3 Foundation Design

A. Foundation design shall be based on the Geotechnical Engineer's recommendations as specified in Division 02.

B. The preferred and standard ground floor construction is a structurally suspended, reinforced concrete floor system supported by drilled piers or grade beams and beams, constructed over an under-floor crawl space meeting the requirements of Section 01.5.
C. Belled (under-reamed) drilled pier foundations are not permitted unless specifically recommended by the Geotechnical Engineer of Record and approved in writing by DeSoto ISD. Auger cast piles maybe be an acceptable option, if soil conditions indicate deep piers and have significant water infiltration in lieu of casing all piers. Straight-shaft drilled piers are the standard foundation type for all DeSoto ISD facilities.
D. Where void forms (carton forms) are used as an alternative to a full crawl space, their use shall be limited to areas where no under-slab utilities are present. Void forms shall be square corrugated fiberboard. Trapezoidal shaped void forms are not permitted.
E. All concrete beam and wall faces shall be formed full height on each side. Earth forms shall not be permitted.
F. Concrete formwork tolerances shall be constructed and maintained as required by ACI 347.
G. Exposed concrete grade beams greater than 12 inches are not allowed unless an intentional design element.
H. All exposed concrete shall be either a smooth finish from the original pour or a hand-rubbed finish.
I. Foundation vents shall be vertical only, with a minimum top of vent elevation of 12 inches above finished grade and shall be equipped with cast aluminum or vandal-resistive vents with non-removable anchoring devices.
J. The brick ledge around the perimeter of the building shall be a minimum of 8 inches deep. The depth shall be increased as required to coordinate with the site grading.
H. Mow strips and house-keeping pads as needed.

3.4 Concrete Reinforcing
A. Reinforcing bars shall meet ASTM A615, Grade 60 (minimum) deformed billet steel.
B. Reinforcing steel shall be domestically manufactured.
C. Rebar grades, sizes, and lengths shall be standardized to the greatest practical extent.
D. Welded wire reinforcing fabric shall meet ASTM A185, Grade 65. Supply welded wire fabric in flat sheets, not in rolls.
E. At slab-on-grade construction (where approved): provide reinforcing bolsters or chairs with sand plates where the base material will not support the chair legs.

3.5 Concrete Materials
A. Minimum concrete compressive strength at 28 days: 3,000 psi for all cast-in-place concrete. The Structural Engineer of Record shall specify concrete strengths for each member type on the structural drawings; these strengths may exceed 3,000 psi as required by design.
B. Design concrete mixes to meet ACI requirements for the specific exposure conditions encountered on the project site.
C. Portland Cement: ASTM C150, Type I, unless job conditions require an alternate cement type. Where the geotechnical report identifies soluble sulfate concentrations exceeding 150 ppm in soil or 75 ppm in groundwater, sulfate-resistant cement (ASTM C150, Type II or Type V) shall be used.
D. Blended Hydraulic Cement: Conform to ASTM C595 Type IL.
E. Fly ash: ASTM C618, Type C or F. Maximum substitution: 25% by weight of total cementitious material. The specific fly ash type and maximum substitution percentage shall be coordinated with DeSoto ISD prior to Design Development.

F. Chemical admixtures shall be selected per job conditions and shall be reviewed and approved by the Engineer of Record.
G. Calcium chloride shall not be used in any concrete mix.
H. Supplementary cementitious material content shall not exceed the amount allowed by the local jurisdiction.
I. Utilize recycled aggregate in concrete design mixes where practicable, provided aggregate quality meets applicable ASTM standards.
J. Curing compounds shall contain no more than 10% solvents.
K. Concrete mix designs shall be reviewed by the Engineer of Record.

3.6 Foundation Design
A. Design the concrete structure to allow for maximum reuse of forms where possible.
B. Size and spacing of structural members shall be chosen for maximum uniformity.
C. Piers: Standardize type and diameter. Where diameters must vary, minimize the number of different sizes used.
D. Columns: Size in multiples of 2 inches. Maintain column cross-section for a minimum of two stories. Changes in column thickness shall use an inside face setback only.
E. Beams and Girders: Size in multiples of 2 inches.

3.7 Testing and Special Inspections
A. A Statement of Special Inspections prepared by the Engineer of Record shall be submitted with the building permit application in accordance with IBC Chapter 17.
B. All construction materials testing and special inspection services shall be provided by a firm registered by the State of Texas per ASTM E329, under the direct supervision of a licensed professional engineer.
C. All Special Inspection and Special Testing requirements shall be noted on the first sheet of the structural drawings.
D. The minimum scope of testing and special inspection shall include concrete cylinder breaks (field-cured and standard-cured); reinforcing steel mill certifications; masonry grout and mortar testing; structural steel weld inspection; high-strength bolting inspection; soils compaction testing; and drilled pier installation observation and documentation (see Division 31).
E. The testing firm shall report all non-conformances directly and simultaneously to the Engineer of Record, the Contractor, and the DeSoto ISD project manager in writing within 24 hours of the non-conformance.
F. Project specifications shall require that all project team members be notified of any installed concrete that fails material testing.

DIVISION 04 -- MASONRY

4.1 References
A. ASTM C 67 - Sampling and Testing Brick and Structural Clay Tile
B. ASTM C 150 - Portland Cement
C. ASTM C 216 - Facing Brick
D. ASTM C 270 - Mortar for Unit Masonry
E. ANSI A41.1 - Building Code Requirements for Masonry
F. TMS 402/602 – Building Code Requirements and Specifications for Masonry Structures, current edition (also referenced as ACI 530/ASCE 5 and ACI 530.1/ASCE 6 in legacy nomenclature).

4.2 Unit Masonry

A. When face brick is to be used, if basis of design is utilized, architect shall have a backup acceptable brick from another manufacturer. Also, consideration will be given to compatibility of the brick with other structures on campus as well as the surrounding neighborhood; durability and availability for current projects as well as future additions will be considered as well. Brick shall only be sourced within a 500-mile radius of job site. When attempting to match an existing brick, the manufacturer and manufacturer's number of the matching brick will be specified. Brick selection must be approved by the owner.

B. Use tooled/concave joint on masonry.

C. Designs requiring special shapes or cuts of brick may be used if used in moderation.

D. Masonry roof parapets will have their roof face protected. Typically, this condition will be addressed as part of the roof flashing system. Exterior plaster or gypsum sheathing systems are not acceptable unless they match an existing building.

E. All masonry walls will have expansion/contraction joints.

F. Joints for expansion, contraction, and building movement will be sealed to prevent weather and water from penetrating to the interior of the building. All vertical and horizontal joints will be drained to daylight above all horizontal surfaces. There will be both a primary (architectural) weather seal and a secondary weather seal where water and moisture could penetrate the wall.

G. Through wall flashing will be provided at wall caps, window heads, shelf angles, base bearing, etc.

H. Masonry anchors to steel framing will be of flexible design, i.e., wire tie strap anchors; corrugated metal ties are not acceptable.

I. Provide appropriate through wall flashing and appropriate "weep" system to provide drainage at cavity walls.

J. Avoid masonry units with high metallic content to minimize efflorescence.

K. Follow recommended practice and detailing of the Technical Notes on Brick Construction, as published by the Brick Institute of America, for brick and masonry construction.

L. Specify a non-gloss masonry water repellant to be applied after completion of masonry installation.

M. The following masonry types are allowed:
- Clay fired brick.
- Concrete masonry units (CMU).
- Burnished block.
- Cast stone.
- Natural stone from Texas quarries only.
- Split-Faced CMU: Allowed only at locations 10 ft-0 in or more above exterior finished grade (exterior applications) or finished floor (interior applications).

N. The following are not allowed:
- High metallic content masonry.
- Masonry cement in mortars.
- Anti-graffiti coatings on masonry.
- Corrugated metal ties as wall anchors.

O. The following are required:
- Masonry units manufactured within 500 miles of the project site shall be given preference, all other selection criteria being equal.
- Exterior masonry joints shall be tooled or concave only.

- Wall assembly mock-ups are required for approval by DeSoto ISD prior to masonry installation on all new construction and addition projects.

P. Attic Stock: Provide 4% for each masonry type

Q. Sealants for expansion, contraction, and building movement shall be sealed to prevent weather and water from penetrating to the interior of the building.

4.3 Concrete Masonry Units (CMU)

A. CMU is acceptable for consideration in exterior use and interior applications.

B. Painted exterior CMU is not acceptable.

C. Comply with sections indicated in Brick Masonry.

D. Load-bearing masonry walls shall generally be avoided. Column-and-beam structural systems are preferred for all typical building areas to allow flexibility for future modifications.

E. Load-bearing masonry may be used for long-span spaces such as auditoriums, subject to prior written approval from DeSoto ISD before Design Development.

G. Foundation design for any load-bearing masonry walls shall specifically address expansive soil conditions per the Geotechnical Engineer's recommendations.

H. Structural masonry design shall comply with TMS 402/602.

4.4 Cast Stone

A. Cast Stone is acceptable for use in limited in exterior applications.

B. Utilized smaller format sizes that can be lifted without crane where appropriate.

C. Utilize engineered anchors and internal reinforcing depending on size and shape.

D. Comply with sections indicated in Brick Masonry.

E. Sealant

4.5 Structural Masonry Requirements

A. All cells containing reinforcing bars, bolts, or other metal anchors shall be grouted solid.

B. All cells at or below grade shall be grouted solid, whether reinforced or not.

C. Reinforcing bars in masonry shall meet ASTM A615, Grade 60 deformed billet steel.

D. Minimum strength of prism assembly: 2,000 psi.

E. Mortar for all exterior and interior load-bearing masonry construction: Type S per ASTM C-270.

F. Reinforced masonry grout: ASTM C-476.

G. Horizontal joint reinforcement: Prefabricated, conforming to ASTM A951, minimum 9-gauge wire, galvanized. Required at CMU construction at 16 inches on center maximum.

4.6 Masonry Veneer (Non-Load-Bearing)

A. Masonry veneer anchors shall be adjustable design with fasteners specifically selected for the backup structural system material.

B. Expansion and contraction joints shall be detailed in the Contract Documents per the recommendations of The Masonry Society (TMS) and the Brick Industry Association (BIA), typically at inside and outside corners (within 5 ft-0 in), offsets, and at regular spacing not to exceed 20 to 30 ft on center.

C. Veneer walls shall be designed with a drainage plane. Cavity width behind masonry veneer: 2 inches minimum. Provide cellular plastic weeps of UV-resistant material at the base of the cavity.

D. Cold-formed metal stud framing used as backup for brick veneer shall be sized to limit lateral deflection to L/600 maximum at exterior conditions, based on steel stud properties only. Minimum exterior cold-formed metal stud framing: 18-gauge material.

E. Through-wall flashing shall be provided at the base of all masonry cavity walls, at wall caps, at window and door headers, at shelf angles, and at all other locations as recommended by the BIA.

F. Weep holes shall be provided at the base of all exterior masonry cavity walls and above all cavity interruptions, at 24 inches on center maximum, using honeycomb-style weep holes.

G. Coping at top of masonry walls: metal coping or cast stone with a profile that prevents moisture intrusion. Metal copings shall extend a minimum of 4 inches above the top of the masonry.

DIVISION 05 -- METALS

5.1 References

A. Applicable Standards

1. AISC 360 – Specification for Structural Steel Buildings, current edition.
2. SJI – Steel Joist Institute Specifications, current edition, for open-web steel joists and joist girders.
3. RCSC – Specification for Structural Joints Using High-Strength Bolts, current edition.
4. ANSI/AWS D1.1 – Structural Welding Code: Steel, current edition, for all welded steel construction.
5. ANSI/AWS D1.3 – Structural Welding Code: Sheet Steel, current edition. Use E60XX electrodes for metal deck welding.
6. SDI – Steel Deck Institute Standards, current edition.
7. AISI S100 – Specification for the Design of Cold-Formed Steel Structural Members, current edition.

5.2 Structural Steel Design

A. Structural steel design shall comply with AISC 360.

B. Select standardized member sizes and shapes that are readily available from local DFW-area suppliers and are economical.

C. Avoid designs requiring full-time connections. Simply supported or partially restrained connections are preferred for ease of future modification.

D. Provide all splice plates with full welds, shown clearly in the structural details.

E. Erection bolts shall not be considered part of the permanent structural design.

F. Hanging or swing connections for beam ends that rely on a single fastener or pin at expansion joints are not allowed.

G. A minimum of two bolts shall be provided at all bolted steel connections.

H. Column anchor rods shall be headed anchor rods, threaded at one end for nut attachment. J- shaped anchor rods are not allowed.

I. Exterior steel members exposed to weather, including lintels and shelf angles, shall be galvanized. Galvanized members shall be properly prepared for painting when a painted finish is specified.

J. Exterior use of aluminum, copper, or brass in structural applications is not allowed. Exception: factory-finished, dark-colored security screen assemblies.

K. Basketball backstop overhead support structures shall be shown on the structural drawings with loads provided by the equipment manufacturer. These structures impose

significant concentrated loads on the roof and ceiling framing and must be fully coordinated with the structural system prior to Design Development.

L. Stage rigging and fly system structural loads (where applicable) shall be coordinated with a Theatre Consultant and shown on the structural drawings. These systems impose significant concentrated loads on roof structure.

5.3 Structural Steel Design

A. Open-web steel joists and joist girders shall be designed and fabricated in accordance with the current Steel Joist Institute (SJI) specifications.

B. Open-web steel joists and joist girders are delegated design elements. Refer to Section 01.7 for delegated design requirements.

C. The use of open-web steel joists is prohibited in crawl spaces. Structure in crawl spaces shall consist of rolled wide flange sections or cast-in-place concrete members.

5.4 Metal Decking

A. Provide galvanized metal deck at all steel roof and floor decking. Minimum galvanizing coating class: G60.

B. Metal deck welding shall comply with ANSI/AWS D1.3 – Sheet Steel. Use E60XX electrodes.

C. Metal decking design shall comply with Steel Deck Institute (SDI) standards.

D. Metal decking used for composite slabs shall be of sufficient gauge to support concrete placement without temporary shoring and without buckling or deformation from construction traffic including wheelbarrows.

E. Where mechanically fastened insulation is used on roof decks: insulation boards shall be 22 gauge or heavier.

F. Follow Factory Mutual (FM) loss prevention guidelines for the local area and building height, including decreased weld spacing at corners and perimeters of roof decks.

G. Provide acoustical metal deck at gymnasiums, multi-purpose rooms, and cafeterias where the deck is exposed.

5.5 Cold Formed Metal Framing

A. Cold-formed metal framing shall conform to AISI S100 – Specification for the Design of Cold-Formed Steel Structural Members, current edition.

B. Cold-formed metal framing used as primary structural elements (load-bearing stud walls, structural roof framing) is a delegated design element. Refer to Section 01.7.

C. Exterior cold-formed metal stud framing: minimum 18-gauge material thickness.

D. Cold-formed metal stud framing used as backup for masonry veneer: sized to limit lateral deflection to L/600 maximum at exterior conditions, based on steel stud properties only.

5.6 Miscellaneous Metal Fabrications

A. Metal handrails shall be fabricated with all joints and ends ground smooth and uniform. Ends shall be plugged. Handrails shall be securely mounted to withstand heavy use.

B. Where dissimilar metals come into contact, provide asphaltic or other approved separation to prevent galvanic corrosion.

C. Bollards shall be concrete-filled steel pipe, painted safety yellow. Provide bollards to protect all electrical transformers, gas regulators, and meters where vehicles may be present.
D. Steel light pole bases shall be bolted to concrete piers.
E. Steel stair assemblies shall conform to the current adopted building code by the City of DeSoto.
Pre-fabricated metal stair assemblies are a delegated design element. Refer to Section 01.7.

5.7 Miscellaneous Metals
A. Miscellaneous metal fabrications will utilize readily available local sections. Do not copper, brass (or other metals that have salvage value) in exterior applications.
B. Exterior ferrous metals used for bollards, ladders, etc., are to be primed and receive a final painted finish or hot dipped galvanized finish. Exterior ferrous metals that are part of the building elements are to have low maintenance coatings.
C. Exterior Retractable Ladders with locks are preferred to be prefabricated aluminum ladders, where steel fabricated ladders are required, they are to be galvanized.
D. New Interior or exterior handrails are to be stainless steel, if integrated into an exterior guard rail system, it is acceptable for the rails to be primed and painted.

DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES

6.1 References
A. APA - Plywood Construction Guide.
B. AWPA C20 - Structural Lumber, Fire-Retardant Treatment by Pressure Processes.
C. AWPA C27 - Plywood, Fire-Retardant Treatment by Pressure Processes.
D. PS1 - Construction and Industrial Plywood.
E. PS20 - American Softwood Lumber Standard.
F. NFPA - National Design Specification for Stress Grade Lumber and its Fastening.
G. Quality Standards: Perform finish carpentry and casework work in accordance with AWI Quality Standards.
1. Standing and Running Trim: AWI Section 300.
2. Shelving: AWI Section 600.
3. Miscellaneous Work: AWI Section 700.
4. Casework and Countertops: AWI Section 400 A, B, and C.

6.2 Rough Carpentry
A. Provide appropriate blocking for all specialty items (marker boards, projection screens, casework, lockers, toilet partitions, toilet accessories, etc.).

6.3 Finish Carpentry & Casework
A. Fixtures and Casework - Use Plastic laminate faces with rubber or PVC door and drawer edging, and Plastic Laminate blunt edging on countertops, with no coves or formed edges on backsplash or countertop. Shelving shall utilize line bore holes with pins, in lieu of channel bracketed type. Interior of cabinets, drawers, and shelf surfaces shall be melamine.
B. Cabinets shall be custom grade and constructed of ¾” plywood for doors, drawers, shelves, drawer sides. Drawer bottoms may be ¼” plywood. Installers to be AWI Certified.

C. Storage shelving - Provide utility grade (pre-finished) metal shelving where warranted if not included in FFE.
D. Provide Best locks keyed alike on all lockable cabinets in each room. All cabinets in counselors' office (test storage), and clinic shall have locks. Drawer locks are preferred over cam locks. Confirm lock locations during shop drawing review.
E. District standard shall be factory finished casework.
F. Carpet/ VCT flooring to terminate at perimeter of casework. Floor finish shall not extend under casework.
G. Stand-alone wooden handrails are not acceptable. Handrails shall be rigid construction made of metal, see Section 05. Wooden handrails can be used when design includes strong metal undercarriage to support rails.
H. Cabinet hardware shall be as follows:
    1. Wire door and drawer pull, brushed stainless steel
    2. 5 knuckle hinges, heavy duty, non-European style.
    3. Drawer guides shall be full extension type, supporting at least 100 lbs. Preferred are KV1800.
I. Accessible knee-space shields shall match adjacent casework; metal pre-formed types are not permissible.
J. Solid surfaces countertops are acceptable for use at specialty locations, such as high-profile reception desks, admin. Etc.
K. Provide chemical-resistant black epoxy countertops at Science Lab and Art Areas.
L. Middle school and High School Science labs cabinets shall be of solid wood construction with clear finish, in lieu of Plastic laminate cladding.
M. Provide built in place mockups.

DIVISION 07 -- THERMAL AND MOISTURE PROTECTION

7.1 References
A. FM - Roof Assembly Classifications.
B. NRCA - Manual or Roof Maintenance and Roof Repair.
C. NRCA - Roofing and Waterproofing Manual
D. UL - Fire Hazard Classifications.
E. SMACNA - Architectural Sheet Metal Manual

7.2 Insulation
A. Where an upper floor level extends over open porches or otherwise exposed to the weather, insulation will be provided to protect the conditioned space above.

7.3 Roofing
A. Roof decks, coverings, flashing, and roof drainage constitute major maintenance, repair, and replacement expenditures. All roofs will be designed as low slope with a minimum of ¼" per foot slope. Slope all roofs to the perimeter of the building. Avoid building designs with multiple roof levels or changes in levels, intersections of expansion joints and penetrating walls, clerestory window and equipment curbs of inadequate height, roof deflections that cause slopes away from drainage, sheet drainage onto walls, unsuccessful detailing, or construction of roof edge gravel stops and undersized drains. No drainage onto walls from adjacent roof areas shall be permitted except under emergency overflow conditions.

B. Design buildings to provide less complicated, simple roof geometry. Roof decks shall have appropriate load carrying capacity, be insulated to comply with energy conservation considerations, and shall be corrosion resistant. The preferred roof system shall be a minimum 60 mil PVC. Metal roofs subject to approval can be used with a preference for no mechanical systems on or passing through the roof. Laminated dimensional shingles are also subject to approval. All roof systems shall have a 20-year no dollar limit (NDL) system warranty and a 5-year contractor's warranty. Architect will assist district in pre-qualifying single ply roofing subcontractors for consideration by General Contractor.

C. Copper, brass, and aluminum flashings and gravel stops are to be avoided due to excessively high cost and problems related to vandalism.

D. Internal roof drains are preferred for new build. Underground tie-in preferred; add cast iron boots. Drainage of roofs shall be accomplished with appropriately placed roof drains, scuppers, or gutters. Roof drains should be paired with overflow drains or overflow scuppers. Through-wall scuppers should have conductor heads and downspouts and be paired with overflow scuppers. Gutters should be fabricated to allow overflow to spill over its edge and not back into the building. Avoid collection of downspouts above the ceiling, routing each instead to the exterior and then to a collection system. All roof drainage shall be collected in an underground drain system and diverted away from the building. Situations where underground drainage is infeasible shall be discussed and approved by the District. All drainage piping shall be inspected by camera in the presence of a DeSoto ISD representative. A video shall be collected during the inspection and one (1) copy shall be provided to the District. Designs including steep pitched roofs are not preferred. On new construction, lightweight cellular insulating concrete will be considered as an acceptable system component if accepted by the roof membrane manufacturer. This acceptance will be confirmed on a case-by-case basis in the review procedure with the District.

E. Roof assemblies shall consist of factory painted steel deck topped with minimum two layers of rigid roof insulation per NRCA and manufacturer recommendations, properly fastened and protected from interior fire exposure where required by the assembly rating. Roof assemblies shall be sloped to drain per City of DeSoto/Glenn Heights or local authority having jurisdiction, but in no case less than ¼" per foot for all other low-slope systems. This will include new and re-roofing applications. When standing-seam metal roofing is used, materials test firm shall inspect all flashing joints and seams; rigid non-hygroscopic insulation shall be fastened to the underside of the roof, but protected on the interior surface as required by City of DeSoto/Glenn Heights building code. Roof and deck assemblies shall comply with UL fire resistance requirements as required by City of DeSoto/Glenn Heights building code or local authority having jurisdiction.

F. Roof systems shall have not less than a UL Class A fire rating and participate in the UL follow-up service to label materials at the jobsite. Roof system shall be installed to FM 1-90 or greater approved assembly and checked to meet ASCE requirements. The more stringent application will be used. Fastening of insulation to increase at the perimeters and corners in compliance. Follow FM 1-49 for perimeter edge treatment where applicable.

G. Mechanical equipment on the roof will be designed to be set on a full curb that flashed in by roofing materials. Minimum height of curb shall be 10" above completed roof membrane taking crickets or tapered insulation into account. Provide additional slope insulation between equipment support curbs to remove water in between such curbs. Provide tapered edge strip on all sides of curbed equipment to prevent water standing against flashings.

H. Test cuts will be performed only where there is reason to suspect that less than proper installation procedures have been used or materials have been shorted.

I. Materials used for patching and repairing existing roofs shall be compatible with existing materials (i.e. pitch, asphalt).

J. For re-roofing existing buildings, contact the District for re-roofing considerations and guidelines for the specific facility.

K. All roof systems shall be reviewed on a Qualifications Form prior to the bid opening. Roof systems not specified or listed as acceptable substitutions in the contract documents shall be deemed non-conforming bids.

L. Listed materials, when part of an acceptable roofing system, shall meet the requirements of the materials' standards specified.

M. Comply with acceptable roofing system manufacturers' recommendations for component roofing systems materials. Materials listed below are for general reference only. Selection of roof system components may vary to conform to overall system design.

1. White, minimum 60 mil fully adhered PVC
2. Minimum R-25 insulation in two layers as approved by roof membrane manufacturer.
   a. Polyisocyanurate: 3.0" first layer to deck mechanically fastened and 1.5" second layer 1.5" adhered with urethane adhesive. First layer fastened to deck through ribs of deck only with length not to protrude beyond underside of roof deck.
   b. Cover board: ½" dens-deck prime adhered with urethane adhesive.
3. System Warranties
   a. 20-year NDL including all insulations, cants, and accessories furnished, covering workmanship and materials, is required for all roof systems. The District must approve warranty form. Specific endorsements of usual warranties by properly executed Exhibit are acceptable. A separate 5-year workmanship and materials warranty from the installing roof contractor, including sheet metals, flashings, curbs, etc. is required.
   b. Source: As approved by roof membrane manufacturer for system warranty: Carlisle, GAF, IB Systems, Johns-Manville, Sika Sarnafil, and Siplast

P. Attic spaces (especially large spaces such as those under sloping roofs) will be semi-conditioned to prevent freezing of water of sprinkler piping. This maybe accomplished through the use of thermostat controlled unit heater or heat strips.

7.4 Roof Accessories

A. Provide walkways as required by roof system manufacturer at service side of roof mounted equipment requiring periodic access, around all roof hatches, top and bottom of roof ladders, pipe supports, and roof access doors. Walkways shall be provided or approved by the manufacturer for inclusion in the required roof system warranty.

B. Provide access ladders to all roof areas that may contain equipment needing service.

C. All multi-level roofs shall have permanently attached ladders between levels with height differentials of 36 inches or greater.

7.5 Sheet Metal Flashing and Trim

A. Exposed sheet metal flashing and/or trim to be prefinished with either Kynar 500 or Duranar 200 or equal as approved by DESOTO ISD. Field painted galvanized elements are not acceptable.

7.6 Metal Panel

A. 24 gage sheet metal R-panel; galvanized or pre-finished per District preference. Metal liner panels at backside of parapet walls, with associated furring, sill trim, head trim, jamb trim, corner closures, and neoprene closures.

7.7 Joint Sealants

A. Type 1: Single component, gun grade urethane sealant for general purpose sheet metal work; Sonneborn Sonolastic NP1.

B. Type 2: Butyl Rubber sealant tape.

7.8 District expectation is to provide effective moisture management and protect building envelope performance by blocking bulk water, controlling air leakage, and managing vapor diffusion.

DIVISION 08 -- OPENINGS

8.1 References

A. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

B. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers

C. UL 10B - Fire Test of Door Assemblies

D. UL 10 C - Standard for Positive Pressure Fire Tests of Door Assemblies - Underwriters Laboratory.

E. UL 305 – Panic Hardware

F. ANSI/BHMA A156.18 - American National Standard for Materials and Finishes - American National Standards Institute/Builders Hardware Manufacturers Association

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for
3. Hardware and Specialties
4. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
5. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
6. ANSI/SDI A250.8 - Standard Steel Doors and Frames

G. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

H. NFPA – National Fire Protection Association
NFPA 70 – National Electric Code

1. NFPA 80 – Standard for Fire Doors and Other Opening Protectives
2. NFPA 101 – Life Safety Code
3. NFPA 105 – Smoke and Draft Control Door Assemblies
4. NFPA 252 – Fire Tests of Door Assemblies

8.2 General

A. Door height shall be 7'-0" typically.

1. Door panel to be plastic laminate

B. Comply with applicable provision of N.F.P.A.-80, including installation, where applicable (for required label construction.)

C. Submittals
1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures
2. Prior to forwarding submittal:
   a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
   b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

D. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
   a. Wiring Diagrams: For power, signal, and control wiring and including:
1. Details of interface of electrified door hardware and building safety and security systems.
2. Schematic diagram of systems that interface with electrified door hardware.
3. Point-to-point wiring.
4. Risers.

E. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
1. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

F. Door Hardware Schedule:
1. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
2. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
3. Indicate complete designations of each item required for each opening, include:
   a. Door Index: door number, heading number, and Architect's hardware set number.
   b. Quantity, type, style, function, size, and finish of each hardware item.
   c. Name and manufacturer of each item.
   d. Fastenings and other pertinent information.
   e. Location of each hardware set cross-referenced to indications on Drawings.
   f. Explanation of all abbreviations, symbols, and codes contained in schedule.
   g. Mounting locations for hardware.
   h. Door and frame sizes and materials.
   i. Degree of door swing and handing.
   j. Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

G. Key Schedule:
1. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
2. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
3. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
4. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
5. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
6. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

H. Informational Submittals
1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
b. Include warranties for specified door hardware.

I. Closeout Submittals
1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
b. Catalog pages for each product.
c. Final approved hardware schedule edited to reflect conditions as installed.
d. Final keying schedule
e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

J. Inspection and Testing
1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
a. Fire door assemblies, in compliance with NFPA 80.
b. Required egress door assemblies, in compliance with NFPA 101.

8.3 Quality Assurance

A. Qualifications and Responsibilities:
1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project’s vicinity. Supplier

to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.

2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   a. For door hardware: DHI certified AHC or DHC.
   b. Can provide installation and technical data to Architect and other related subcontractors.
   c. Can inspect and verify components are in working order upon completion of installation.
   d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications
1. Fire-Rated Door Openings:
   a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
   b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
2. Smoke and Draft Control Door Assemblies:
   a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
   b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
3. Electrified Door Hardware
   a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
4. Accessibility Requirements:
   a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings
1. Keying Conference
   a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
   b. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
   c. Preliminary key system schematic diagram.
   d. Requirements for key control system.

e. Requirements for access control.
f. Address for delivery of keys.

2. Pre-installation Conference
   a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Inspect and discuss preparatory work performed by other trades.
   c. Inspect and discuss electrical roughing-in for electrified door hardware.
   d. Review sequence of operation for each type of electrified door hardware.
   e. Review required testing, inspecting, and certifying procedures.
   f. Review questions or concerns related to proper installation and adjustment of door hardware.
3. Post-Installation Warranty Meeting
   a. Contractor shall schedule and attend an 11th-month warranty walkthrough with the Owner, Architect, and manufacturer's representative to identify Division 08 warranty items for correction prior to the end of the 12-month warranty.
4. Electrified Hardware Coordination Conference:
   a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

D. Delivery, Storage, and Handling
1. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping
2. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
3. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
4. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware
5. losses both before and after installation.
6. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
7. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

E. Coordination
1. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
2. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
3. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
4. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

F. Warranty
1. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
a. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
b. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
2. Mechanical Warranty
a. Locks
i) Schlage ND Series: 10 years
b. Exit Devices
i) Von Duprin: 10 years
c. Closers
i) LCN 4000 Series: 30 years
ii) LCN 1260 Series: 20 years
d. Automatic Operators
i) LCN: 2 years
ii) Electrical Warranty
e. Locks
i) Schlage: 3 years
f. Exit Devices
i) Von Duprin: 3 years
g. Closers
i) LCN: 2 years

G. Maintenance
1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
2. Turn over unused materials to Owner for maintenance purposes.

8.4 Manufacturers

A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.

B. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.

C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

8.5 Materials

A. Fabrication
   1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
   2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
   3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
   1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

C. Cable and Connectors:
   1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
   2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
   3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

8.6 Hinges

A. Manufacturers and Products:
   1. Scheduled Manufacturer and Product:
      a. Ives 5BB series
   2. Acceptable Manufacturers and Products:
      a. No Substitute

B. Requirements:
   1. Provide hinges conforming to ANSI/BHMA A156.1.
   2. Provide five knuckle, ball bearing hinges.
   3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
      a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
      b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
   4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
      a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
      b. Interior: Heavy weight, steel, 5 inches (127 mm) high
   5. 2 inches or thicker doors:
      a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
      b. Interior: Heavy weight, steel, 5 inches (127 mm) high
   6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
   7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.

8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins
9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

8.7 Electric Power Transfer

A. Manufacturers:
   1. Scheduled Manufacturer and Product:
      a. Von Duprin EPT-10
   2. Acceptable Manufacturers and Products:
      a. No Substitute

B. Requirements:
   1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
   2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

8.8 Flush Bolts

A. Manufacturers:
   1. Scheduled Manufacturer:
      a. Ives
   2. Acceptable Manufacturers:
      a. No Substitute

B. Requirements:
   1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

8.9 Coordinators

A. Manufacturers:
   1. Scheduled Manufacturer:
      a. Ives
   2. Acceptable Manufacturers:
      a. No Substitute

B. Requirements:
   1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.

2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

8.10 Cylindrical Locks – Grade 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage ND series
2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
2. Indicators: Where specified, provide escutcheon with lock status indicator window on top of lockset rose:
   a. Escutcheon height (including rose) 6.05 inches high by 3.68 inches wide.
   b. Indicator window measuring a minimum 3.52-inch by .60 inch with 1.92 square- inches of front facing viewing area and 180-degree visibility with a total of .236 square- inches of total viewable area.
   c. Provide snap-in serviceable window to prevent tampering. Lock must function if indicator is compromised.
   d. Provide messages color-coded with full text and symbol, as scheduled, for easy visibility.
   e. Unlocked and Unoccupied message will display on white background, and Locked and Occupied message will display on red background.
3. Cylinders: Refer to "KEYING" article, herein.
4. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
5. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
6. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
8. Provide electrified options as scheduled in the hardware sets.
9. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
   a. Lever Design: RHO

8.11 Deadbolts

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage B600/B700/B800 Series
2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide grade 1 deadbolt series conforming to ANSI/BHMA A156.
2. Cylinders: Refer to "KEYING" article, herein.

3. Provide deadbolts with standard 2-3/4 inches (70 mm) backset. Provide 2-3/8 inches (60 mm) where noted or if door or frame detail requires. Provide deadbolt with full 1-inch (25 mm) throw, constructed of steel alloy.
4. Provide manufacturer's standard strike.
5. Lock Status Indicator Trim: Where specified, provide escutcheon with lock status indicator widow.
   a. Escutcheon height 4.125 inches, width 2.54 inches. Projection 1.32 inches on thumbturn side and 1.28 inches on cylinder side.
   b. Unlocked and Unoccupied message will display on white background, and Locked and Occupied message will display on red background.
   c. Provide snap-in serviceable window to prevent tampering. Lock must function if indicator is compromised.
   d. Indicator window to provide 180-degree visibility.

8.12 Exit Devices

A. Manufacturers and Products:
   1. Scheduled Manufacturer and Product:
      a. Von Duprin 99 series
   2. Acceptable Manufacturers:
      a. No Substitute

B. Requirements:
   1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
   2. Cylinders: Refer to "KEYING" article, herein.
   3. Provide grooved touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
   4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
   5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
   6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
   7. Provide flush end caps for exit devices.
   8. Provide exit devices with manufacturer's approved strikes.
   9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
   10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
   11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
   12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
   13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
   14. Provide electrified options as scheduled.

15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

8.13 Power Supplies

A. Manufacturers and Products:
1. Scheduled Manufacturer and Product:
a. Schlage/Von Duprin PS900 Series
2. Acceptable Manufacturers:
a. No Substitute

B. Requirements:
1. Provide power supplies approved by manufacturer of supplied electrified hardware.
2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
4. Provide power supplies with the following features:
a. 12/24 VDC Output, field selectable.
b. Class 2 Rated power limited output.
c. Universal 120-240 VAC input.
d. Low voltage DC, regulated and filtered.
e. Polarized connector for distribution boards.
f. Fused primary input.
g. AC input and DC output monitoring circuit w/LED indicators.
h. Cover mounted AC Input indication.
i. Tested and certified to meet UL294.
j. NEMA 1 enclosure.
k. Hinged cover w/lock down screws.
l. High voltage protective cover.

8.14 Electric Strikes

A. Manufacturers and Products:
1. Scheduled Manufacturer and Product:
a. HES 5000 Series

B. Requirements:
1. Provide electric strikes designed for use with type of locks shown at each opening.
2. Provide electric strikes UL Listed as burglary resistant that are tested to a minimum endurance test of 1,000,000 cycles.
3. Where required, provide electric strikes UL Listed for fire doors and frames.
4. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.
5. Electric strikes shall be permitted only for retrofit applications only when required.

8.15 Cylinders

A. Manufacturers:
1. Scheduled Manufacturer and Product:
a. BEST
2. Acceptable Manufacturers and Products:
a. Falcon
B. Requirements:
1. Provide cylinders/cores to match Owner's existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.

8.16 Keying
A. Scheduled System:
1. Existing factory registered system:
a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
B. Requirements:
1. Construction Keying:
a. Temporary Construction Cylinder Keying.
i) Provide construction cores that permit voiding construction keys without cylinder removal, furnished in accordance with the following requirements
ii) Split Key or Lost Ball Construction Keying System.
iii) 3 construction control keys, and extractor tools or keys as required to void construction keying.
iv) 12 construction change (day) keys.
b. Owner or Owner's Representative will void operation of temporary construction keys.
i) Replaceable Construction Cores.
c. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
i) 3 construction control keys
ii) 12 construction change (day) keys.
d. Owner or Owner's Representative will replace temporary construction cores with permanent cores.
2. Permanent Keying:
a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
i) Master Keying system as directed by the Owner.
b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
c. Provide keys with the following features:
i) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
ii) Patent Protection: Keys and blanks protected by one or more utility patent(s).
iii) Geographically Exclusive: Where High Security or Security cylinders/cores are indicated, provide nationwide, geographically exclusive key system complying with the following restrictions.

d. Identification:
   i) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
   ii) Identification stamping provisions must be approved by the Architect and Owner.
   iii) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
   iv) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
   v) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
e. Quantity: Furnish in the following quantities.
   i) Permanent Control Keys: 3.
   ii) Master Keys: 6.
   iii) Change (Day) Keys: 3 per cylinder/core that is keyed differently
   iv) Key Blanks: Quantity as determined in the keying meeting.

8.17 Key Control System

A. Manufacturers:
   1. Scheduled Manufacturer:
      a. Telkee
   2. Acceptable Manufacturers:
      a. HPC
      b. Lund

B. Requirements:
   1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
      a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
      b. Provide hinged-panel type cabinet for wall mounting.

8.18 Door Closers

A. Manufacturers and Products:
   1. Scheduled Manufacturer and Product:
      a. LCN 4040XP series exterior openings
   2. Acceptable Manufacturers and Products:
      a. No Substitute

B. Requirements:
   1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
   2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.

3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
11. Closers shall be capable of being upgraded by adding modular mechanical or electronic components in the field.

8.19 Door Closers

A. Manufacturers and Products:
   1. Scheduled Manufacturer and Product:
      a. LCN 1260 series interior openings
   2. Acceptable Manufacturers and Products:
      a. No Substitute

B. Requirements:
   1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
   2. Provide door closers with fully hydraulic, full rack and pinion action with cast iron cylinder.
   3. Closer Body: 1-3/8-inch (35 mm) diameter with 5/8-inch (16 mm) diameter pinion journal diameter heat-treated pinion journal and full complement bearings.
   4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
   5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
   6. Pressure Relief Valve (PRV) Technology: Not permitted.

7. Provide stick on and special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

8.20 Electromechanical Automatic Operators

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. LCN Senior Swing
2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide low energy automatic operator units that are electromechanical design complying with ANSI/BHMA A156.19.
   a. Opening: Powered by DC motor working through reduction gears.
   b. Closing: Spring force.
   c. Manual, hydraulic, or chain drive closers: Not permitted.
   d. Operation: Motor is off when door is in closing mode. Door can be manually operated with power on or off without damage to operator. Provide variable adjustments, including opening and closing speed adjustment.
   e. Cover: Aluminum.
2. Provide units with manual off/auto/hold-open switch, push and go function to activate power operator, vestibule interface delay, electric lock delay, hold-open delay adjustable from 1 to 32 seconds, and logic terminal to interface with accessories, mats, and sensors.
3. Provide drop plates, brackets, and adapters for arms as required to suit details.
4. Provide motion sensors and/or actuator switches, and receivers for operation as specified. Provide weather-resistant actuators at exterior applications.
5. Provide key switches, with LED's, recommended and approved by manufacturer of automatic operator as required for function as described in operation description of hardware sets. Cylinders: Refer to "KEYING" article, herein.
6. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.

8.21 Door Trim

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives
2. Acceptable Manufacturers:
   a. No Substitute

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

8.22 Protection Plates

A. Manufacturers:

1. Scheduled Manufacturer:
    a. Ives
2. Acceptable Manufacturers:
    a. No Substitute

B. Requirements:
1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

8.23 Door Stops and Holders

A. Manufacturers:
1. Scheduled Manufacturer:
    a. Ives
2. Acceptable Manufacturers:
    a. No Substitute

B. Provide door stops at each door leaf:
1. Provide stops in closers wherever possible.
2. Where a stop cannot be used in the closer, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

8.24 Silencers

A. Manufacturers:
1. Scheduled Manufacturer:
    a. Ives
2. Acceptable Manufacturers:
    a. No Substitute

B. Requirements:
1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

8.25 Thresholds

A. Scheduled Manufacturer:
1. Zero International

B. Acceptable Manufacturers:
1. No Substitute

C. Seals and Gasketing: Provide continuous gasketing on exterior openings, to the head and jambs, forming a continuous seal between the door and the frame. Provide smoke, light, or sound gasketing on interior doors where indicated.
1. Provide self-tapping fasteners for aluminum extruded gasketing being applied to hollow metal frames.
    a. Provide non-corrosive fasteners for all exterior applications.

b. Provide security fasteners where indicated.

2. Provide neoprene, EPDM, silicone, or nylon brush inserts as specified in hardware sets. Provide non brush inserts of solid or sponge cell, as specified in hardware sets. Vinyl inserts are not allowed except where specified in hardware sets.

D. Smoke Labeled Gasketing: At all smoke labeled openings, provide smoke listed perimeter gasketing assemblies complying with NFPA 105 listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for smoke control ratings indicated based on testing according to UL 1784.

E. Fire Listed Gasketing: Assemblies complying with NFPA 80 that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction for fire ratings indicated based on testing according to UL-10C.

1. Where frame-applied intumescent seals are required by the manufacturer, provide gaskets that comply with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies and UBC 7-2, Fire Tests of Door Assemblies.

F. Sound-Rated Gasketing: Provide acoustic gasketing to meet Sound Transmission Class (STC) rating required.

G. Meeting-Stile Gasketing: Provide meeting-stile gasketing that fastens to the meeting stiles forming a continuous seal when doors are closed.

H. Door Sweeps or Shoes: Apply to the bottom of the door to close the gap between the door bottom and finished floor or saddle threshold.

1. Provide solid neoprene, EPDM, silicone, or nylon brush type of seal as specified in hardware sets. Vinyl inserts are not allowed except where specified in hardware sets.

I. Automatic Door Bottoms:

1. Provide closed cell sponge, bulb neoprene. or EPDM type of seal as specified in hardware sets.

2. Door bottom to be mortised, semi mortised, or surface mount as with a minimum thickness as specified in hardware sets.

J. Rain Drips:

1. Provide overhead rain drips for out-swinging hollow metal doors that are not covered against 45 degree blowing rain. Aluminum extrusion to be a minimum of .088 inches thick and extend 2.50 inches from the face of the frame, in anodized finish to match door.

2. Door sweeps or shoes with integral rain drip must meet ADA requirements

K. Thresholds: Provide threshold units not less than 4 inches wide, formed to accommodate change in floor elevation where indicated, and fabricated to accommodate door hardware and fit door frames.

1. Threshold extrusion to be a minimum thickness as specified in hardware sets.

8.26 Door Position Switches

A. Manufacturers:

1. Scheduled Manufacturer:

a. Schlage

2. Acceptable Manufacturers:

a. No Substitute

B. Requirements:

1. Provide recessed or surface mounted type door position switches as specified.

2. Coordinate door and frame preparations with door and frame suppliers. If switches are being used with magnetic locking device, provide minimum of 4 inches (102 mm) between switch and magnetic locking device.

8.27 Finishes

A. FINISH: BHMA 626/652 (US26D); EXCEPT:
   1. Hinges at Exterior Doors: BHMA 630 (US32D)
   2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
   3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
   4. Protection Plates: BHMA 630 (US32D)
   5. Overhead Stops and Holders: BHMA 630 (US32D)
   6. Door Closers: Powder Coat to Match
   7. Wall Stops: BHMA 630 (US32D)
   8. Latch Protectors: BHMA 630 (US32D)
   9. Weatherstripping: Clear Anodized Aluminum
   10. Thresholds: Mill Finish Aluminum

8.28 Examination

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

8.29 Installation

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
   1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
   2. Custom Steel Doors and Frames: HMMA 831.
   3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
   4. Installation Guide for Doors and Hardware: DHI TDH-007-20

B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.

C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.

I. Lock Cylinders:
   1. Install construction cores to secure building and areas during construction period.
   2. Replace construction cores with permanent cores as indicated in keying section.
   3. Furnish permanent cores to Owner for installation.

J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
   1. Conduit, junction boxes and wire pulls.
   2. Connections to and from power supplies to electrified hardware.
   3. Connections to fire/smoke alarm system and smoke evacuation system.
   4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
   5. Connections to panel interface modules, controllers, and gateways.
   6. Testing and labeling wires with Architect's opening number.

K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

L. Continuous Hinges: Re-locate the door and frame fire rating labels where they will remain visible so that the hinge does not cover the label once installed.

M. Door Closers & Auto Operators: Mount closers/operators on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers/operators so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

N. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

O. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

P. Thresholds:
   1. Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
   2. Aluminum thresholds to be cut-in, and scribed around mullions, frame members, and stops. Do not butt to thresholds. Provide a continuous surface across full width of opening from jamb to jamb.
   3. Where aluminum panic-type (rabbeted) thresholds with neoprene inserts are specified, undercut doors as required to properly mate with seal in threshold.

Q. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

R. Perimeter Gasketing:
   1. Apply to head and jamb, forming seal between door and frame.
   2. Install gasketing in a manner eliminating need to cut any seal to install surface mounted hardware. Install compatible mounting bracket for surface mounted hardware unless minimum 1/4 inch thick solid aluminum seals are provided for mounting of surface applied hardware.

S. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

T. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

8.30 Adjusting

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
   1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.

2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

8.31 Cleaning and Protection

A. Clean adjacent surfaces soiled by door hardware installation.
B. Clean operating items per manufacturer's instructions to restore proper function and finish.
C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

8.32 Door Hardware Schedule

A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

8.33 Hardware Standards:

A. Locks
B. Lock brand/series: Schlage ND - Cylindrical
C. Acceptable brand/series: Schlage ND - Cylindrical
D. Overall lever design: Rhodes:
E. Notes: No Substitutions, Locks are ND-RHO-BD SFIC,
F. Storeroom on classrooms and admin offices.
G. Staff restrooms are to have indicators and always locked to prevent student access.
H. 626 finish

8.35 Keying

A. Key system brand: SFIC
B. Keying Security: Standard
C. Cylinder type: SFIC
D. Const. keying ☐ OR Keyed const. core ☒
E. Notes: No Substitutions, SFIC- contact Maliko for keyway F,K and L

8.36 Exit Devices

A. Exit device brand/series: Von Duprin 33/99 - Grooved
B. Acceptable brand/series: Von Duprin 33/99 - Grooved
C. Preferred function for pairs of doors: Rim X Rim X Removable Mullion

D. Provide levers at: All exit device locations
E. Provide pulls at: All exterior locations
F. Dogging standard: Cylinder Dogging
G. Through bolts/SNB: Yes ☒ / No ☐
H. Mullion storage kits: Yes ☒ / No ☐
I. Notes: VD No Substitutions, Per the district rim by rim by mullion on pairs with exit devices. Wide style 99 is preferred no vertical rods.

8.37 Closers, Stops, Auto. Operators & Flat Goods
A. Closer brand/series: LCN 4040 - Cast Iron
B. Acceptable brand/series: LCN 1261:
C. Through bolts/SNB: Yes ☒ / No ☐
D. 4000 series cover: Snap on ☐ OR Screw on ☒
E. Cover: Powder Coat ☒ OR Plated ☐
F. Rank stop preferences*:
G. #1: SCUSH closer arm
#2: Floor stop
H. *Holder preferences to follow unless otherwise noted: If a hold open is requested end-user would prefer a hold open arm on the closer.
I. Automatic Operator brand/type: LCN 9500 - Electromechanical
J. Kickplate standard: 12"
K. Notes: LCN No Substitutions, District prefers the LCN 1261 on the inside and 4040XP on the exterior.

8.38 Electrified Preferences
A. Lock preference: Electromechanical locks - match lock brand preference
B. Exit device preference: QEL - Quiet latch retraction
C. Power transfer preference: Electrified hinge OR In-frame power transfer as required
D. Built-in request to exit: Yes ☒ / No ☐
E. Include connectors: Yes ☒ / No ☐
F. Notes: Electric strikes HES 5000 only when electric strikes are required

8.39 Access Control
A. Credential type: Smart - By others:
B. Card reader technology: Smart - By others:
C. Notes: Card readers and Cards are HID

8.40 Door Standards
A. Hollow metal door core standard: Honeycomb core
B. Hollow metal door brand: Republic
C. Substitutions allowed: Yes ☐ / No ☒
D. Welded frames ☒ OR Knock-down frames? ☐
E. Substitutions allowed: Yes ☐ / No ☒
F. Blocking required at locks? Yes ☒ / No ☐
G. Blocking required at exits? Yes ☒ / No ☐
H. Blocking required at closers? Yes ☒ / No ☐
I. Aluminum storefront stile dimension standard: Wide Stile 4 3/4" - 6"
J. Notes: Zero Gasketing is preferred, Ives hinges, No Substitutions

K. No continuous hinges the district prefers ball bearing hinges.

8.41 General Notes
A. Standard finish: Brushed/Satin Chrome - 626
B. Pre-Install/Post-Install Meeting: Yes ☒ / No ☐
4.Notes:

8.42 Glazing
A. Exterior window glazing will be 1" double pane insulated, tinted gray.

8.15 Cabinet Hardware
A. Provide teacher wardrobe locks that are compatible with CompX National.
B. All millwork requiring locks use CompX National. NO EXCEPTIONS.

DIVISION 09 -- FINISHES

9.1 General Notes
A. The use of maintenance free materials and surfaces is encouraged.
B. Student toilet, shower, dressing and locker rooms must be designed for durability, ease of cleaning, simplicity of maintenance, and repair.
C. Rubber treads are not acceptable, except where matching existing construction. In these cases these treads must be rubber, with 2-part epoxy adhesive, 2-part epoxy nose filler. Please follow industry specifications on proper amount of nose filler to be installed.
D. Floor finishes (final decision per District):
1. Vinyl Composition Tile: new VCT shall be scrubbed to remove the factory seal with green or blue pad with cleaner “blue” diluted at 4 oz. to 1-gallon ratio. The new VCT must then be rinsed and dried. Finish the new VCT with seven (7) coats of Buckeye, Clarion 25 finish (wax). Install per the manufacture’s specifications.
2. Terrazzo: The contractor shall seal new terrazzo; the contractor will apply wax / finish. Use as requested by the District.
3. The use of Quarry Tile shall be limited to kitchen areas only and requires the district’s prior approval for use in other locations. Where and if permitted, the contractor must seal new quarry tile, including grout joints, per manufacturer’s recommendations.
4. Carpet/ VCT flooring to terminate at perimeter of millwork. Floor finish must not extend under millwork.
5. Luxury Vinyl Tile: To be used specifically for admin areas only.
E. Ceramic tile grout joints in restrooms shall be sealed to control odors and shall not use epoxy grout, except at kitchen and shower areas. Use darker shades for floor grout color. Porous material must be treated to prevent staining.
F. Quarry floor tile or solid fluid applied epoxy flooring with non-slip surface is to be used in all food prep areas with sealed grout joints.
G. Architect/Engineer will discuss with district at the initiation of the project the use and extent abuse resistant gypsum board, CMU, or wall tile in areas likely to be subjected to vandalism, i.e. corridors.
H. Consideration may be given to CMU partitions where integration with existing construction is an issue. CMU is not the preferred finish in new construction except at athletic locker room areas and gymnasiums.

I. abuse-resistant gypsum board, CMU, or wall tile will be provided in locations subject to potential vandalism, i.e., corridors, laboratories, stairs, etc. Provide 4”x4”x4’ stainless steel corner guards on exposed sheet rock outside corners to 4’ feet above floor finish in corridors. Other corner protection measures may be acceptable if proven to be durable.

J. Unwanted sound transmission between classrooms and other spaces is an important concern for the district. Mechanical rooms will be sound dampened and isolated from adjacent space. Avoid, where possible, locating a mechanical room adjacent to a classroom.

K. Provide for sound isolation of classrooms. For sound control, use partitions that run to deck and are sealed to deck. (3-1/2" metal studs with one layer 5/8" gypsum board each side) with 4" batt insulation. (Fire Rated walls will be additive to this method)

L. Gypsum board partitions around shower areas are prohibited. Glass or plastic shower enclosures are prohibited.

M. Cement based backer board with tiles is to be utilized in wet areas, such as restrooms, showers, kitchens, water fountains, etc. Gypsum backed board is not acceptable for use in any wet areas. Provide FRP 4’ past mop sink sides.

N. Finish painting is not required behind lockers, only tape and floating required.

O. Wall carpet, sisal fiber wall covering, and vinyl wall covering is not acceptable in any situation.

P. Cleanable Ceiling material in kitchen, storeroom, and cafeteria must be acceptable to the Health Department having local authority and jurisdiction. Access to fire-stats on kitchen exhaust hood will be unobstructed. There shall be no exposed piping ducts.

Q. Ceiling material, if 2’x2’ ACT tiles at vestibules shall be held down with hurricane clips.

R. Floor prep – Cement based floor float/patch will be used in all floor prep installations. Cement based moisture resistant float/patch will be used where applicable. NO white or chalk-based floor patch to be used.

S. Cove Base: 4” rubber cove based will be used when there is VCT removed and VCT installed, also when carpet is removed and carpet is installed.

T. Adhesive Installation: VCT tile adhesive and pressure sensitive adhesive for carpet tiles will be installed using a 1/16”x1/16”x1/16” notched trowel.
Floor covering installation requirement:
All floor covering installations, VCT tile, carpet tile, rubber flooring, and gym flooring will be rolled after installation with a 100 lb. roller to ensure bonding of product to substrate.

9.2 Finishes

A. Floors, acceptable but not limited to:
Any ceramic tile installation: 6” x 6” minimum floors and no less than 4” in any nominal dimension for walls. Exceptions to be confirmed by District. All need to have 4” rubber floor or integrated metal base. Other systems for consideration with district

Elementary Schools

Classrooms (Elementary)
Pre-Kindergarten, Kindergarten, 1st, 2nd, 3rd, 4th and Elementary Age Special Education Room:

A. ¼ Turn Pattern Vinyl Floor Tiles (VCT) - ASTM 1066, 1/8” x 12”x12”, integral color
B. Provide large format tile with minimal grout lines in multi-accommodation restrooms, and small K and Pre-K Restrooms
C. ACT Ceiling - Armstrong

Teacher Work Rooms/Copy Center:

A. Vinyl Floor Tiles (VCT) - ASTM 1066, 1/8” x 12”x12”, integral color

Media Center
A. Carpet Tile

Offices, Coaches Office, Lounges:
A. VCT

Restrooms/adjacent to classrooms
A. Full height ceramic tile walls/floor and ceramic base.
B. ACT Ceiling

Restrooms off corridor
A. Full height ceramic tile walls/floor and ceramic base.

Kitchens
A. Quarry Tile 6” x 6” minimum floor Tile with epoxy grout (or)
B. Full height wall tiles.
C. Others only by prior approval by District.
D. 4 ¼” x 4 ¼” minimum wall tile in any direction in kitchen, larger format tiles preferred except at accent areas.
E. ACT ceiling

Cafeteria
A. VCT / Tile wainscot up to 6’-0”

Corridors
A. VCT / Tile wainscot up to 6’-0”
B. Ceramic tile behind drinking fountains
C. 2x2 ACT ceiling

Custodial Closets
A. No ceilings if walls go up to deck
B. Sealed concrete floors

Electrical Rooms/ IDF
A. Fire rated plywood at walls
B. No ceilings if walls go up to deck

Entryways
A. VCT / Tile Wainscot

Gymnasium
A. Athletic surfacing (synthetic, rubberized, multisport)
B. CMU Walls
C. Tectum or sound absorbing wall panels
D. 6” Cove base with lip along floor

Platforms (Stages and Steps)
A. Black VCT stage, wood preferred (no VCT at existing wood stage)

P.E. Locker Rooms
A. Sealed Concrete (Level 2)
B. Ceramic tile

Entry Vestibule
A. VCT

Secondary Schools (Middle School, High School)

Classroom and Corridors
A. Vinyl Floor Tiles (VCT) - ASTM 1066, 1/8” x 12”x12”, integral color, Armstrong White Out 57518 in classrooms.
B. VCT at slab-on grade facilities in corridors.

Restrooms/adjacent to classrooms

A. Tile walls / floors

Restrooms off corridor

A. Tile walls / floors

Laboratories, Science, Art, etc.

A. VCT

Gymnasiums

A. H.S. and M.S.: Hardwood Grade A (D.I.N. certified)
B. CMU Walls with acoustical considerations.

Offices, Media Center

A. Carpet

Lounges

A. VCT

Kitchens

A. Quarry Tile 6” x 6” minimum floor Tile with epoxy grout (or)
B. Full height wall tiles.
C. Others only by prior approval by District.
D. 4 ¼” x 4 ¼” minimum wall tile in any direction in kitchen, larger format tiles preferred except at accent areas.

Stages - High School

A. Plywood sprung system similar to dance– (Finish – Flat Black with clear polyurethane finish)

Stages - Middle School

A. Pine sprung floor like dance.

Auditoriums

A. Carpet Aisle
B. Sealed Concrete under seats.

Cafeterias

A. VCT

Athletic / PE Locker Rooms

A. Brushed Concrete (Level 2)
B. Ceramic tile, wet areas
C. Fluid Applied Epoxy
D. Non-Porous Rubber Flooring at High School Level

Entry Vestibule

A. VCT Preferred
B. Entryway Walkoff Carpet Tile acceptable

General:

Mechanical, Storage, Janitor Rooms

A. Sealed Concrete

Behind drinking fountains

A. 6” x 6” min. Ceramic tiles

Under kilns

A. Concrete

B. Walls and Partitions, acceptable but not limited to:

Any ceramic tile installation: 6” x 6” minimum floors and 4 ¼” x 4 ¼” minimum walls. At high school level, all Gypsum wall boards will be impact resistant. Impact resistant gypsum board in high use areas when not covered by tile at other levels.

Classrooms, Instruction and Kindergarten
Painted gypsum wallboard, Concrete Masonry Unit (CMU)
Corridors
Secondary corridors, Multi-layered gypsum board, with durable wainscot; Main corridors CMU, Ceramic or Porcelain tile. For elementary: tile up to 7'-2" AFF. For Middle, High school: tile up to 7'-2" AFF.
Toilets, Gym Dressing Rooms, Showers – Student Use
CMU, ceramic tile full height of wall, or glazed CMU.
Kitchen and Custodial
From floor to height of tile-ceiling.
Ceramic Tile full height/CMU (Custodial Only)
Serving Line
Ceramic Tile full height
Cafeteria
CMU, multi layered gypsum board, Wall Tile Wainscot.
Faculty and Administrative Restrooms
Floor to ceiling tile preferred.
CMU, cement board, 4'-0" Wainscot ceramic tile
Clinic, Administrative Offices
Gypsum wallboard
Stages
CMU, multi-layered gypsum board, Black.
Shops/Art
CMU. Impact resistant Gypsum Board, Provide ceramic tile on walls next to kiln.
Laboratories
Gypsum wallboard or CMU
Stairs
CMU, impact resistant gypsum wallboard / tile wainscots
Gymnasium
CMU with acoustical properties at appropriate heights, Tectum
Dance
Multipurpose flooring
Music/Band/Orchestra
Carpet
Weight Room
Rubber
Jan./Stor./IDF/Elec.
Sealed concrete

C. Ceilings:
All areas, unless noted otherwise:
1. 2' x 2' non-directional tile with mineral board in exposed tee configuration. Use Armstrong Fine Fissured only.
Classrooms:
1. 2' x 2' non-directional tile with mineral board in exposed tee configuration. Use Armstrong Fine Fissured. Consider enhanced absorption tiles in Classrooms.
Offices:
2. 2' x 2' non-directional tile with mineral board in exposed tee configuration. Use Armstrong Fine Fissured.

Public Restrooms (Middle, High schools)
1. ACT Ceiling
Public Restrooms (Elementary schools):
1. ACT Ceiling
Kitchen areas and Custodial:
1. 2' x 2' membrane faced gypsum tile - washable
Gym Ceiling:
1. Painted Exposed Structure with acoustical absorption (acoustical deck or other method)

D. Ceiling heights:
Classrooms, Corridors and Stairways: 9'-0" min.
Fine Arts & CTE Spaces: 10'-0" min.
Large Areas: 12'-0" min.
Non-Competition Gymnasiums: 20'-0" clear for Elementary
30'-0" clear for Middle, High Schools
Competition Gymnasiums: 35'-0" clear for Middle, High Schools

E. Colors for above finishes, including paints, casework, toilet partitions, flooring, doors and frames, etc. will be gathered and selected as soon as possible. Color board Presentation of these colors will then be made for approval to District. Approved color board is to be used by District for furniture and equipment selection. Water base latex enamel paint is preferred on CMU surfaces. Latex paint is preferred on gypsum board surfaces. Eggshell finish for walls and Flat finish for ceilings is standard. Hollow Metal Doors and Frames to have a durable semi-gloss finish. Verify standard wall paint color with District.

9.3 DESOTO ISD Standard Materials/Colors/Attic Stock:

A. Provide extra materials for owner's attic stock as noted below. Extra materials shall be delivered to the owner's designated location by the contractor.

1. Minimum Carpet Specification - Carpet Tiles
   a) Product: Riot – Roust About
   b) Manufacturer: Mohawk Group or approved equal selected by DESOTO ISD.
   c) Other acceptable manufacturers: As approved by DESOTO ISD
   d) Attic Stock: Provide 5% of floor area covered for each color.
2. Gymnasium Multi-Purpose Flooring (elementary schools and middle schools)
   a) Product: Tarkett and Gerflor are approved flooring products.
   b) Manufacturer: Tarkett and Gerflor
3. Gymnasium Wood Flooring (middle schools)
   a) Product: Oil base gym floor finish (2 coats)
   b) Manufacturer: Buckeye gym finish.
   c.) Attic Stock: Provide 5% of floor area covered.
4. Gymnasium Wood Flooring (high schools)
   a) Product: Oil base gym floor finish (2 coats) in competition gyms. Oil base (2) coats in JV and practice gyms.
   b) Manufacturer: Buckeye gym finish.
   c) Attic Stock: Provide 5% of floor area covered.
5. Standard weight room flooring (middle and high schools)
   a) Product: Subject to compliance with requirements, provide available products that may be incorporated into the Work, but are not limited to, the following:
      1) Regupol American for rolled rubber flooring
   b) Product Standard: ASTM F 1859.
      1) Type: Type I (homogeneous recycled rubber sheets without backing).

2) Thickness: Min 15mm/0.59 Inches for High School Weight Rooms, Min 13 mm/0.51 S
   a) Wearing Surface: Smooth
   b) Sheet Width: As standard with manufacturer.
   c) Colors and Patterns: Minimum 35% color, 65% concentration black color

6. Acoustical Wall Panels
   a) Product: As appropriate for application
   b) Manufacturer: Wall Technology; Tectum
   c) Hanging: Anchor with continuous z-bars with 2" minimum clearance above panel for placement and removal of panel. In athletic areas provide (2) 2"x2"x6" wall brackets to prevent panel movement or dislodging due to objects striking the panel.
   d) Provide Fabric-Covered Acoustical Panels for Fine Arts room.

7. Acoustical Ceiling Panels
   a) Manufacturer: Armstrong
   b) Attic Stock: Provide 5% of ceiling area covered for each type of panel and grid.
8. Quarry Tile
   a) Manufacturer: Dal Tile; Metropolitan Ceramics
   b) Grout: Provide epoxy-based grout in the food prep areas (where approved by the district).
   c) Surface Prep: per manufacturer's recommendations
   d) Attic Stock: Provide 2 cartons of each color of floor tile. Provide 20 lf of each color of base.
9. Ceramic Tile
   a) Product: wall and floors tile
   b) Manufacturer: Dal Tile, Master Tile, Summitville, Crossville, Ceramic Tile International, American Olean, American Tile Supply and Inter-ceramic
   c) Surface Prep: per manufacturer's recommendations
   d) Attic Stock: Provide 4 cartons of each color of floor tile, 4 cartons of each color of wall tile and 40 lf of each color of base.
10. Vinyl Composition Tile (VCT)
   a) Product: 1/8 inch thickness minimum
   b) Manufacturer: Armstrong only.
   c) Attic Stock: Provide 5% of floor area covered for each color.
11. Interior Paint
   a) Product: Water base latex enamel –Sherwin-Williams semi-gloss, Loxon Acrylic Block Filler for interior CMU
   b) Manufacturer: ICI, Sherwin-Williams Promar 200 Semi-gloss, Promar 200 Interior Latex for interior CMU
   c) Color: DESOTO ISD White-Promar 200 Semi-gloss (DESOTO ISD will provide formula)
   d) Attic Stock:
      1) Provide 20 gallons of each color for walls and doors, and 5 gallons of each color of trim and accents at High Schools.
      2) Provide 15 gallons of each color for wall and doors, and 4 gallons of each color of trim and accents at Middle Schools.
      3) Provide 10 gallons of each color for walls and doors, and 3 gallons of each color of trim and accents at and Elementary Schools.

4) Provide 10 gallons of each color for wall and doors, and 3 gallons of each color of trim and accents for renovation projects.

12. Exterior Paint
    a) Product: Exterior Acrylic latex paint
    b) Manufacturer: Sherwin-Williams, flat or satin
    c) Reds shall not be used on building surfaces.
    d) For metal surfaces, use DTM paints.
    e) All paints will be water based; oil-based paints are only used for asphalt, sidewalks, and other traffic areas.
    f) Gas lines to be painted yellow.
13. Finishes Schedule (Based on approved color schemes)

DIVISION 10 -- SPECIALTIES

10.1 Tackboards and Markerboards

A. Tackboards: Provide tack boards in corridors, one per classroom. Size will be approved by district in design phase.
    1. Three-component type:
    2. Vinyl cover, over 1/4" corkboard, laminated to 1/4" hardboard
    3. Length - one piece through 16 feet
    4. Thickness - 1/2"
    5. Quantity in classrooms
        a) Elementary:
            1) Grades Pre K-1: (4' x4') 8’ total
            2) Grades 2 - 6: (4' x 4') 8’ total
        b) Secondary:
            1) Grades 7-12: (4' x 4') 4’ total

B. Markerboards (provide in all classrooms)
    1. 24-gauge minimum steel base metal plate.
        a) Porcelain Enamel Coatings:
        b) .0025" thick nickel cobalt primer
        c) .003" thick writing surface
        d) .0025" thick nickel cobalt ground coat
        e) Colors - white.
        f) Trim - extruded aluminum
        g) Accessories - map rail, chalk trough, flag holders (two per room)
        h) Length - one piece through 16’-0”
        i) Quantity: Elementary 16 LF on two walls
        j) Quantity: Secondary 16 LF on two walls

10.2 Display cases (must be recessed into wall)

A. Elementary schools: one near gym area.
B. Secondary schools: Two, one near the office, and the other near the gym area.
C. Locations: hallways as follows - foyer, cafeteria entrance, art classroom area, homemaking classroom area, library area and gym area.
D. Type:
    1. Basis of Design: Claridge 390 or equivalent
    2. Glass with full-frame around all glass edges. sliding bypass openings for hallway side with locks.

2. Provide integrated LED lighting.
3. Minimum of 14" depth.
4. Provide only in readily available sizes.

10.3 Bulletin Boards

A. Provide one (4'x4' min.) tack board in all offices and in corridor adjacent to:
1. General Office
2. Area of Teacher "sign-in"
3. Lounge and workroom area
4. Cafeteria (covered or enclosed)
5. Head Custodian workroom
6. At entrance to corridors/classroom wings.
7. Nurse's office.

10.4 Toilet Compartments and Screens:

A. Primary and Secondary Schools – Floor to ceiling mounted preferred (9'-0" max ceiling height). Phenolic. Stainless, heavy-duty vandal-proof hardware, and plastic boots.
1. Basis of design: Comtec.
2. Color: Black.
B. Provide appropriate blocking in walls and ceilings.
C. All partition doors shall be continuously hinged. Wall support channels shall be heavy duty and continuous.
D. Urinal Screens – preference is built-in wall screens in lieu of pre-fab screens. Floor-to-Wall-mounted screens are also acceptable. Wall only mounted partitions are not acceptable.

10.5 Toilet and Dressing Room Accessories:

A. Tissue Holders - big roll at student restrooms; double roll in adult areas. (Furnished by Contractor and installed by Contractor).
1. Big roll - Bobrick 9890, or equivalent
2. Double roll – Bobrick B-274 or equivalent
B. Paper Towel Dispensers - Surface mounted (roll only) only, required in all Adult Toilet Areas. Folding Type to be utilized above sinks in lab / work room areas only (confirm with district. (Furnished by Contractor and installed by Contractor).
1. Roll Type – Bobrick B-72974 or equivalent
2. Folding type – Bobrick B-9262 or equivalent
C. Provide electric hand dryers in student areas, hand dryers to be readily available and low noise (below 65db). ADA compliant.
1. Basis of Design: Saniflow Speedflow-plus or equivalent
2. High Velocity Dryers are not acceptable.
D. Do not provide paper towel dispensers in group student restrooms.
E. Manual foam soap dispensers – Surface mounted.
1. Bobrick – B-26637 or equivalent
F. Mirrors - Mount as appropriate for grade level.
G. Grab bars - Comply with ADA requirements. Mount according to age groups listed in TAS.
H. Robe/Towel Hooks – comply with ADA requirements
I. Shower Seats- comply with ADA requirements
J. Mop rack with shelves at custodial closets.
K. Provide shower curtains at coach's locker rooms and group shower areas.

L. Sanitary Napkin Disposers - provide stall mounted stainless steel disposal in all female restrooms at the middle school level and above.
   1. Bobrick B-270 or equivalent.
M. Sanitary Napkin Dispensers - provide at Secondary schools and Staff restrooms. - provide stainless steel, fully recessed, dispenser with free operation.
   1. Bobrick B-4706C or equivalent.
N. Individual showers preferred

10.6 Lockers
A. Middle and High P.E. Locker Rooms:
   1. Street Clothes Lockers: 12" x 12" x 36" double tier; one for each student assigned at any one period only.
   2. Gym Clothes Lockers: ventilated 12" x 12" x 12" six tier; 1:1 for each student enrolled in physical education, assuming 50/50 boy/girl campus enrollment.
   3. Lock Provision: built-in combination locks (verify with DESOTO ISD), with pull handle.
B. Athletic Locker Rooms:
   1. Volleyball - Varsity - 18” x 18” x 72” single tier
   2. Volleyball - Junior Varsity & Freshman - 18” x 18” x 36” double tier
   3. Girls Basketball - Varsity - 18” x 18” x 72” single tier
   4. Girls Basketball - Junior Varsity & Freshman - 18” x 18” x 36” double tier
   5. Boys Basketball - Varsity - 18” x 18” x 72” single tier
   6. Boys Basketball - Junior Varsity & Freshman - 18” x 18” x 36” double tier
   7. Softball - Varsity - 18” x 18” x 36” single tier
   8. Softball - Junior Varsity & Freshman - 18” x 18” x 36” double tier
   9. Baseball - Varsity - 18” x 18” x 36” single tier
   10. Baseball - Junior Varsity & Freshman - 18” x 18” x 36” double tier
   11. Football - Varsity - 24” x 24” x 72” single tier football locker
   12. Football - Junior Varsity & Freshman - 24” x 24” x 36” double tier
   13. Soccer - Varsity - 24” x 24” x 36” double tier if shared with football, otherwise 18” x 18” x 36” single tier
   14. Soccer - Junior Varsity & Freshman - 18” x 18” x 36” double tier
   15. Boys Tennis - 18” x 18” x 36” double tier
   16. Girls Tennis - 18” x 18” x 36” double tier
   17. Boys Track - 24” x 24” x 36” double tier if shared with football, otherwise 18” x 18” x 36” double tier
   18. Girls Track - 18” x 18” x 36” double tier
   19. Visitors - 18” x 18” x 36” double tier
   20. Drill Team - 12” x 12” x 60” single tier
   21. Coaches - 24” x 24” x 72” single tier executive lockers
   22. Lock Provision: separate padlock for high school, built-in combination lock for middle school (verify with DESOTO ISD), with pull handle. Locks to be provided in contract.
   23. For HS Varsity lockers only, consider durable non-metal options in lieu of Metal if budget allows.
   24. For ES Dance lockers, provide appropriate height for ES
C. Locker room benches shall be anchored firmly to the floor.
D. Kitchen: Appropriate number of lockers is to be provided for kitchen employees for coats and street clothes. Solid Plastic or Metal Lockers are acceptable. Locker size to be 12” x 12” x 72”.

10.7 Exterior Signage

A. Site signage will be provided as required to adequately convey the desired information around the site as required by Codes and as recommended by the Architect and as approved by the Owner. Signs shall be properly installed in a concrete footing.

B. Building Marquees will be provided as a permanent sign display and be provided with full color LED. Provide cellular connectivity and backup wired data and power. Location to be discussed with owner.
   1. Basis of design: Daktronics Galaxy GS-6
   2. Comply with city sign ordinances.
   3. Resolution and size of such to allow clear reading of text.
   4. Digital double sided ground mounted signs preferred.

C. Exterior Graphics
   1. School name (new school only) - Locate out of low reaching distance.
   2. Street Name and Number - (for Fire Department Use)
   3. Temporary project sign full color with rendering - furnished by contractor

10.8 Interior Signage

A. Architect will formulate a proposal and provide DeSoto ISD for review of the proposed graphics, room numbering sequence, and name plates; all are to comply with requirements of the Americans with Disabilities Act (ADA). Careful consideration shall be given to the installation hardware and type to prevent vandalism. Room signs shall not provide removable, snap on/off plates that can be easily removed or vandalized. Sign samples will be presented to District prior to submittal approval.

B. Number all rooms, including mechanical, toilets, custodian, electrical rooms, etc. with consideration of the existing building numbering scheme when available. All room signs shall have the room number and the architectural room number when non-duplicate. The architectural room number shall be embossed or raised letters without color and located in the lower right-hand corner. Room number, name and Braille shall be centered left-to-right and from the top of the sign to the top of the fixed clear window slot. The Braille shall be ½" below the bottom row of text.

C. All rooms shall be numbered and names for non-typical classroom spaces shall be used such as toilet, administrative, library, etc. Provide 6"x6" signs for Type A (classrooms & offices with fixed window slots) & Type B (all locations except classrooms & offices without window slots). Provide 8"x8" signs for Type C (restrooms) and type D (pictogram & ADA signs). Provide slots at Classrooms and Offices.

D. Teacher's card insert and room number combined for classroom type spaces.

E. All shall have radius corners and be made of Special Purpose SP125 decorative thermosetting high pressure laminate, ¼" thick with a melamine surface and a phenolic resin core.

F. Provide mechanically fastened vandal resistant mounting. Wall mount with glue & screws, countersunk. Glass mount with vinyl tape and provide solid cover plate for back side of sign.

G. Product shall be from Best Sign Company or approved equal.

H. Plaque - new construction and additions only; size 22" x 24" maximum, cast aluminum preferred include project name, construction year, names of board members and DeSoto ISD personnel, Construction Program Supervisor, Architect and general contractor. Coordinate with the District for the standard DESOTO ISD plaque design.

I. Logos and graphics to be reviewed by DESOTO ISD

J. Provide roof access signage.

10.9 Fire Extinguishers and Fire Extinguisher Cabinets
- A. Kitchen area: Carbon dioxide extinguisher mounted on brackets. (No CFCs).
- B. All other areas: Dry chemical extinguisher mounted in recessed cabinets.
- C. (No CFCs).
- D. Provide cabinet door-type catches in lieu of “break glass” type cabinets without locks.

10.10 Emergency Access
- A. Provide one or more “Knox Box” at locations as required and approved by the Fire Marshall having jurisdiction, including but not limited to, front entrance, storm shelter, riser room, and gate-controlled areas. Provide Knox Box for shunt at main electrical. The box(s) are to be monitored by the District police department.

10.11 Awnings and Covered Walkways:
- A. All materials to be prefinished with Kynar 500 or equal anodized finish.
- B. Aluminum construction with minimal exposed fasteners

10.12 Flag poles
- A. Provide for the location and installation of 2 flagpoles, except High Schools where there will be 3. Flagpole will be located near the principal entrance to the building. Flagpole height will be appropriate to the building scale and meet local code requirements. If design is such that consideration is given to locating the flagpole at other than the principal entry, such as a courtyard, gather prior approval.
- B. Owner to provide Flags for Poles.

DIVISION 11 -- EQUIPMENT

11.1 Custodial Room Equipment
- A. Storage:
  1. Shelving to allow for tissue and lamp storage.
  2. Allow space for storage carts 36" (W) x 18" (D) x 30" (H). 4 are required at elementary schools.
  3. Allow space for work bench and tool storage cabinets (not in contract).
  4. Verify door size requirements with DESOTO ISD in order to accommodate floor cleaning equipment storage. In Middle and High Schools provide 4’-0” door for all Custodial Closets. Additionally High Schools provide Main Closet with double 4’ doors and space for auto scrubbers and an extractor. Main Closet will be located adjacent to Cafeteria area.
  5. Closet to be large enough for floor cleaning machines.
  6. No custodial office required; room to be storage/office combined.
- B. Mop Racks
  1. Wall mounted – pre-fabricated metal type with shelf preferred.
- C. Custodial Sinks:
  1. Service sink to accommodate 12–16-quart mop buckets.
  2. Use floor-basin-type service sinks.

11.2 Gymnasium Equipment
- A. Elementary Schools

1. Basketball backboards:
    a) Provide four glass backboards (2 for full court and two for half court play) - equip these backboards with motorized worm gear crank operated lifting ratchet, forward- folding at main goals, side goals to be backwards folding. If wall mounted due to space, provide manual crank lifting operation. (Structural support for backboards is required.)
    b) Verify during the design phase any equipment to be provided by DESOTO ISD.
    c) Interior striping shall be for Basketball and Volleyball

B. Middle and High Schools
1. Basketball backboards:
    a) Provide glass backstops.
    b) Provide four additional sets of glass backboards for half court play - equip these backboards with motorized operative lifting ratchet, back-folding if possible. (Structural support for backboards is required.)
2. Volleyball Inserts:
    a) Anchor into concrete slab beneath gym floor.
    b) Three sets of volleyball inserts are to be provided at each gym.
    c) Contractor provide Inserts and matching equipment for each court.
3. Gym Seating:
    a) Fixed seating in quantity to allow for seating of 2/3 of student enrollment preferably locating half on each side of gym in performance gyms. Retractable bleachers preferred.
    b) General Gymnasium Considerations:
        1) Provide wall padding on walls adjacent to basketball backstops.
        2) Provide Impact Protection (wire covers) or Impact Resistant Wall items - Clocks, lights, Motion detectors, Wi-Fi Boxes, Antennae, Fire alarm, etc. in Gymnasiums
        3) Provide separate locations for gymnasium storage and power transformer/electrical panel equipment. (No exceptions)
        4) Verify during the design phase any equipment to be provided by DESOTO ISD (including scoreboards).
        5) Provide power, data, and scoreboard control on both sides of court. Locate in wall.

C. Outside hard surfaced play areas, provide for hard surfaced play area at elementary and middle schools with two (2) pole mounted basketball backboards with half court striping. Reference DESOTO ISD Educational Specifications for additional information.
D. Protection covering for all wall-mounted gym equipment shall be included as necessary.
E. Provide scoreboards in competition gyms. Score table and chairs to be owner furnished and owner installed.
F. Logos and graphics to be reviewed by DESOTO ISD.
G. Wall pads to be provided in ES,MS, and HS gyms.
H. Cart mounted displays to be provided for ES and MS gymnasiums.
I. Provide (4) speakers in the gymnasium.
J. Weight Room equipment manufacturer shall be Pro-Maxima
K. Preferred hydrotherapy products:
1. Whitehall Extremity Whirlpool Baths
2. Whitehall Stationary/Plumbed Whirlpool Baths
3. Bailey Whirlpool Tables Model 7720 and 7724

11.3 Stage Equipment

A. Secondary with full production Auditorium
   1. Overhead lights - minimum of three rows (bars with individual spots).
   2. Dimmer control both with public address systems amplifier, switch panel and monitor speaker, turntable/recorder with phone input capability. Dimmers for stage and spotlighting only with minimum incandescent lights on dimmer (major house light – Full Range LED house lights on separate switches). Dimmer unit to be the type recommended by DPS.
   3. Spotlights for general stage - illuminations (include off stage spots for front stage illumination). Catwalk optional.
   4. Projection screen (overhead mounting). Motorized (Consider Large Format TV on each side of stage as option)
   5. Curtain, stage - rear cyclorama, concert, curtain, front curtain, and both side cyclorama, side masking at 6' o.c.
   6. Public address system with alarm signal override.
   7. Provide acoustic treatments, if necessary, for the intended use.
   8. Identify all circuits.
   9. Provide ventilation for control panels and dimmer boards
   10. Reference Division 27 for additional requirements.

B. Elementary with Stage (Cafetorium)
   1. Dimmer control panel - stage and basic spotlights only.
   2. Spotlights for stage illumination (ceiling or wall mounted).
   3. Large format QLED TV (100”+) on each side of stage in lieu of drop-down screen with long throw high resolution projector
   4. Curtains: Front curtain, rear cyclorama and both side cyclorama.
   5. Public address system with alarm signal override.
   6. Consider lighting and HVAC requirements.
   7. Provide Ventilation for control panels and dimmer boards.
   8. Reference Division 27 for additional requirements.

11.4 Food Service

A. DeSoto ISD designated representative to provide contact information for Foodservice Director, or Child Nutrition Services, to be used for kitchen and dining design and scope.
B. DeSoto ISD requires a kitchen consultant with K-12 experience to be included in defining the scope and layout of all new and remodel projects.
C. Foodservice / Kitchen consultant to meet all TEA requirements
D. DeSoto ISD Foodservice Director to coordinate with their design manager / Child Nutrition department during design.
   1. Foodservice Director, or Child Nutrition Department, to review design during design development phase and provide feedback on equipment location and brand.
   2. Foodservice Director, or Child Nutrition Department, to provide written approval of design prior to design moving into contract documents to verify design and intend meets District needs.
   3. Once approved and design moves into construction phase, Architect or General Contractor to submit for health department review.
   4. DeSoto schools may not pursue green building certifications; however, considerations should be made to make the school design sustainable within reason.

E. Architect to review all new and existing conditions and conduct a meeting on site with DeSoto ISD Foodservice Director to verify scope of work in kitchen area.

F. Comparable products may be used as approved by architect or DeSoto ISD Foodservice director.

1. Product not listed as an approved alternative in the written specifications to be demonstrated and approved through submittal process or where indicated as a substitution request. Alternate requests to indicate quantities, type, function, verify utility connections match prime specifications, show just cause and other characteristics that equal or exceed those of the specified product.

G. The selected equipment should be one with a long life, high durability and low maintenance while ensuring the lowest possible upfront cost.

Coordination & Infrastructure:

H. Mechanical, Electrical and Plumbing: Refer to Divisions 22, 23, and 26 for additional information

1. Architect, Engineers, and design professionals to coordinate both in-contract and owner furnished equipment
2. Kitchen to have 75-foot candlelight as a minimum.
3. Any exterior door into kitchen shall have a card reader for card access control, a doorbell that can be heard in the kitchen for deliveries and visitors, and window view port for safety. (NOTE: card access and key access to be provided for staff and vendors doorbell with strobe/visual item through the kitchen)
5. Exterior doors to have air curtains for pest and temperature control.
4. Kitchen dock location should not interfere with bus pick up or drop off areas. Protect service door with awning and provide adequate lighting.
6. Door to be 42” wide minimum. (NOTE: for safety and security, the district prefers camera located at the outside of the receiving door and inside camera facing the receiving door.
7. Provide trash can washing station at service entry.
8. Provide a slip-resistant concrete slab and slope to drain away from building.
9. Provide space for trucks up to back up to the door of kitchen as closely as possible to unload supplies. Dock area should be concrete with a drainage system at the lowest elevation. Provide curb ramp nearby dock area for hand trucks.
10. Structure to provide recessed insulated floor foundation to set freezer and cooler flush to kitchen floor eliminating need for ramps and/or steps.
11. Tile floors in kitchen shall be sloped to floor drains. Slope should be uniform and continuous to perimeter of area. Ensure that the floor slopes do not exceed 2% in any direction as applicable under Texas Accessibility standards.
12. New electrical panels to be in accessible areas and clearly labeled.
13. Located panel boards in kitchen to serve their respective loads. In kitchen area, use stainless steel or NEMA rated for wet/damp locations.
14. Provide ground-fault circuit-interrupter type receptacle for 20-amp receptacles shown on drawings in kitchen.
15. Gas piping for kitchen area to only be exposed below, or behind, equipment and not contained within walls.
16. Domestic hot water to kitchen area should be 140 dg. F.
17. Kitchen shall have a standalone domestic hot water heater that is not tied to the building domestic water system.

18. Hot water for dish machine's final rinsing systems shall be 180 dg. F and provided by booster heater on dish machine.
19. All hand sinks to have mixing valve.
20. The kitchen exhaust hood fire protection system should be included with the hood, with any interconnecting piping provided by the HVAC contractor
21. All kitchen hood exhaust duct work shall be welded black iron with field wrap insulation or factory welded prefabricated stainless-steel duct.
22. Plumbing to coordinate installation of an automatic gas shut off valve for gas cooking equipment with food service consultant.
23. Plumbing to provide backflow preventors to equipment as required by code
24. Provide a grease trap, sized per local code.
25. Exact size to accommodate school population and kitchen capacity.
26. Grease trap to be chemically treated
27. Provide location of grease trap to allow it to be serviceable. Preferable to have adjacent to kitchen.
28. Architect or Engineer to provide water quality report and determine if a kitchen water softening system is required.
29. If required, all softeners shall utilize a three-valve bypass, installed prior to the resin tank. Resin tanks shall be constructed of galvanized steel and shall be equipped with steel or brass multiport diaphragm head. Brine tank shall be plastic or fiberglass and shall incorporate dry-shelf salt storage. The system shall also provide for automatic bypass during regeneration. Locate water softener installation near an outside service entrance of the building for easy access for maintenance.
30. Kitchen floors and other associated rooms with water usage shall be fully drained using deep-seal P-traps with floor-sinking type floor drains with removeable covers and strainers.
31. Kitchen comfort is a high priority, and the HVAC engineer shall attempt to balance the kitchen to maintain a comfortable working environment. Kitchen should have an HVAC zone with exhaust hood also providing tempered make-up air to condition the space.
32. HVAC vents to be positioned in kitchen so as not to disrupt cooking or equipment performance. For example, to minimize condensation, an HVAC vent should not blow on the walk-in cooler/freezer doors.
33. HVAC engineers to comply with NFPA standards for Ventilation Control and Fire Protection and the trigger, or operation, of any extinguishing system shall automatically shut off all sources of fuel and heat to all equipment requiring protection by that extinguishing system.
34. All electrical sources located under the ventilation equipment (kitchen exhaust hood cookline) shall be shut off upon the operation of a wet chemical or water fire extinguishing system. Provide shunt trip accessory on each circuit breaker serving an electrical appliance under the hood. Install control wiring between shunt trips and the hood extinguishing system, coordinate all wiring with supplier of hood fire suppression system for proper selection of shunt trip coil voltage, momentary or maintained-contact closure to active shunt trip and inter-connections. Operation of a hood extinguishing system shall automatically shunt trip all associated circuit breakers.
35. The operation of any extinguishing system shall automatically signal the building fire alarm system.

36. Kitchen walk-in refrigerators and freezers are to be circuited to the emergency power panel to maintain power in the event of a power failure or disruption.

I. Kitchen Space

J. Floors, walls, and ceiling to be non-porous, washable, durable surfaces for ease of cleaning, with a light color for maximum reflection of light. Floor drains and electrical service will be provided for cleaning. Walls around storage areas are to extend up to the structure for security. All non-refrigerated storage areas shall be ventilated to maintain a 70-degree ambient air temperature with minimum humidity.

K. Foodservice Office
1. Provide office and administrative space for all managerial supervisors. Office to have the ability to enter all data into computer and print reports. Computer/Point of sales systems to be linked to the POS at serving lines, printer, and safe. All items listed are by other trades.
2. Provide window in office for manager to view kitchen and serving lines.

L. Eye wash
1. Kitchen to have an add on eye wash unit to one of the hand sink, one closes to the Janitor closet.

M. Janitorial
1. Kitchen to have a dedicated mop sink and chemical storage
2. Kitchen to have a dedicated residential washer and dryer, side-by-side and top load preferred. Most current models are provided at each school.

O. Restrooms/Staff area
1. Kitchen to have a dedicated toilet facility with hand washing sink that is dedicated to kitchen staff.
2. Restroom cannot open directly to a foodservice environment so provide staff locker room as vestibule.
3. Provide a minimum of 10 half lockers at Elementary and Middle Schools, with bench. High School with 16 half lockers with bench.
4. Staff break room for 6 staff seating with millwork counter, faucet, sink and microwave.

P. Receiving
1. Provide receiving area for the delivery of all foodservice and related products, supplies and materials. This area will also be used for food service employees and maintenance personnel.
2. Outside receiving area to have hot and cold-water hose bibb for general cleaning (by others)
3. Indoor receiving area to have receiving table so manager and staff can check off items that are being delivered.
4. Equipment required for this area
5. Receiving table (inside)(All table height at 34”)
6. Air Curtain (outside, under awning)
7. Hand sink
8. Trash can

Q. Walk-in Cooler and Freezers
1. Walk-in units to be recessed into 8” pit to make unit flush with kitchen floor.
2. Kitchen flooring to continue into walk-in for seamless transition.
3. Freezer and Cooler to have their own entrance except where this is not possible and a waiver is granted by the district. (K through 12 schools, provide 10’ x 21’ for both cooler and freezer)

4. Insulation to meet or exceed current requirements.
5. Equipment required for this area
6. Walk-in cooler / Freezer
7. Walk-in remote condenser
8. Shelving system mobile
9. Bun pans racks mobile
10. Utility carts mobile
11. Dunnage racks
12. FIFO #10 can storage rack
13. Hand sinks
14. Trash cans

R. Serving lines (for all grade levels)
1. Architect to coordinate with DeSoto ISD on number of serving lines per the amount of students at each lunch rotation.(Currently the Elementary has 2 counter, Middle school 4 serving counter and High school will be case by case).
2. Dry wells for all hot food serving counter through the district including double tier frost tops. All counters to be on 6” stainless steel legs.
3. Coordinate electrical and plumbing requirements per design.
4. Coordinate conduit for data lines to point of sales at serving lines, refer to DeSoto ISD information technology department.
5. Single line queuing at each serving lines
6. Provide roll down security grilles or door system between serving lines and dining to close off kitchen and serving lines during closed hours.
7. Each serving line to have a junction box on the floor, or counter, for single point connection.
8. Additional equipment required in this area
9. Serving counters
10. Milk coolers mobile
11. Display refrigerator (pass-thru or reach-in). Preferred brands Delafield or Traulsen
12. Display heated cabinet (pass-thru or reach-in). Preferred brands Delafield or Traulsen
13. Condiment counter
14. Serving counters
15. Hand sink
16. Trash can
17. Ice Cream built-in to serving counter

S. Preparation area
1. Provide a central area to wash, clean and sort all food items needed in the production department. Accumulate, weigh, and / or measure all ingredients required for production and distribution of food items according to production schedule, standardized recipes and requisition.
2. Equipment required in this area
3. Prep table with sinks (All table height at 34”)
4. Disposer provide one in prep area
5. Drying rack mobile
6. Worktable with drawer
7. Baker’s table with drawers
8. Ingredient bins mobile
9. Equipment stands mobile

10. Mobile proofing cabinet District prefers Avantco or MoTak (High school only)
11. Shelving mobile
12. Bun pan racks mobile
13. Utility carts mobile
14. Can opener
15. Ice Maker District prefers Hoshizaki F-450 for Elementary and Middle School and F-600 for High School (Manitowoc is as acceptable)
16. Hand sink
17. Trash can
18. Manual food slicer on mobile equipment stand
19. Hose reel for washing down the floor

T. Production Area
1. Provide space to prepare all menu items requiring cooking functions and support for serving.
2. Work area to be well lit with protective lens covers, moisture or vapor proof where applicable.
3. Equipment required in this area
4. Worktable (All table height at 34”)
5. Hot water dispenser
6. Microwave
7. Convection oven District prefers Blodgett or Vulcan
8. 2 Burner range District prefers Garland or Vulcan
9. Steamer District prefers Groen
10. Tilt skillet District prefers Cleveland or Vulcan
11. Floor trough
12. Staging table (All table height at 34”)
13. Exhaust hood with fire protection system District prefers Mod-U-Serv
14. Hand sink
15. Trash can
16. Pizza conveyor oven(double stack) on mobile equipment stand (High school only)

U. Soiled and Clean Dish Area
1. Dish pit to have 3-compartment sink, clean and soiled dish tables, ware wash machine and tray drop off area.
2. Space to have roll down enclosure by General Contractor to close off space when not in use.
3. Equipment required in this area
4. 3 compartment sink
5. Soiled and clean dish tables
6. Dishwasher (Conveyor system) District prefers Champion or Jackson
7. Water tempering kit for high heat units
8. Booster heater
9. Disposer at the soiled dish table
10. Drying racks mobile
11. Utility carts mobile
12. ADA Hand sink
13. Trash cans
14. Hose reel for washing down the floor

V. Hand sinks

1. Hand sinks to be placed throughout the kitchen to meet local Health Department codes. All hand sinks to be provided with electronic eye sensor.

11.6 Life skills Equipment

A. Life skills bench in restroom area will be provided as FFE. Provide electrical power as part of contract.

B. Overhead lift at life skills restroom area and required power. Coordinate with DESOTO ISD to determine if lift is required.

11.7 Science Equipment

A. All casework locks are to be keyed alike.

B. Sciences Equipment to match built in-all wood casework with black epoxy tops.

11.8 Commercial Laundry Equipment

A. Washer-Extractors/Drying Tumblers - Commercial
   1. To be provided at High School Football Locker Room.
   2. Speed Queen 55 LB Stack Tumble model with electric connection preferred s
   3. Provide 4'-0" door to room.

B. Washer-Extractor
   1. Capacity: 60+ lb.
   2. Speed: 6-speed unit
   3. Volume: 9.0 cu.ft.

C. Drying-Tumblers
   1. Capacity: 75+ lb.
   2. Motor: ¾ HP, Gas 165,000 BTU/HR
   3. Electrical Requirements: 120/60/1
   4. Air Outlet: 8"0

D. Heavy-Duty Washers And Dryers
   1. To be provided at basketball and baseball locker rooms.
   2. Provide 4'-0" door to room.

E. High-efficiency Washer - front load
   1. Capacity: 2.80+ cu.ft.
   2. Speed: Variable, 5 cycles
   3. Electrical requirements: 120/60/1-15 amp

F. High efficiency dryers
   1. Capacity: 7.0+ cu.ft.
   2. Speed: 6 cycles
   3. Temperatures: 3
   4. Electrical Requirements: 240v, 30-amp, 3-PEG NEMA Receptacle

11.9 Projection Screens:

A. Furnish and install manual borderless projection screen with overhead, concealed mounting. Theatrical Rigging – Integrated motorized screens in MS / HS auditorium areas only. All other areas to utilize Mobile TV or large format Wall mounted TV Devices. Discuss with District prior to implementation in other areas.

B. Reference Division 26 for additional power and Division 27 for AV signal cabling requirements.

11.10 Playground Equipment and Structures

A. Playground Equipment – 5 to 12 years age range

1. General Requirements
2. Play system must meet minimum requirements for state and federal safety / ASTM requirements.
3. Play system must meet minimum requirements for ADA / TAS compliance.
4. Design to include a minimum of one (1) independent supporting element such as swings, climbers, and spinners are required.
5. Total play system and supporting elements must accommodate a minimum of two (2) classes at a time / approximately fifty (50) users.
6. Playground equipment installer qualifications: minimum of five (5) years' experience and have a copy of Certificate certified by the manufacturer for the installation of the play equipment brand selected.
7. Playground equipment components to be certified by IPEMA's third-party product certification service.
8. All aluminum structural components to be powder coated.

B. Approved Manufacturers / Vendors:
1. Burke
2. Gametime
3. Kompan
4. Landscape Structures

C. Playground Inspection – services, inspection and report indicating compliance / non-compliance with the local, state and federal regulations prepare by a Certified Playground Safety Inspector (CPSI).

D. Playground Equipment – 2 to 5 years age range (required for schools with programs with children in this range such as PreK-K or special needs programs.
1. General Requirements
2. Play system must meet minimum requirements for state and federal safety / ASTM requirements.
3. Play system must meet minimum requirements for ADA / TAS compliance.
4. Design to include a minimum of one (1) imaginative play component such as a play-house, play panel, or water play table.
5. Total play system and supporting elements must accommodate a minimum of one (1) class at a time / approximately twenty-four (24) users.
6. Playground equipment components to be certified by IPEMA's third-party product certification service.
7. All aluminum structural components to be powder coated
8. Play areas shall be rubber surfaced

E. Approved Manufacturers / Vendors:
1. Burke
2. Gametime
3. Kompan
4. Landscape Structures

F. Playground Inspection – services, inspection and report indicating compliance / non-compliance with the local, state and federal regulations prepare by a Certified Playground Safety Inspector (CPSI).
G. Shade Structure – Integrated Shade
H. Fabric Shade Structures for Play Areas
1. General Requirements
2. Commercial grade
3. Shade structure must have a minimum six (6) foot clearance over tallest item / play structure component.
4. Rectangle, Square or Triangle shades are acceptable.
5. Footings must be embedded and designed by a structural engineer for wind and weight load.
6. Fabric must block a minimum of 90% of the UV light.

I. Approved Manufacturers / Vendors
1. U.S. Shade
2. Modern Shade
3. Shade System
4. SkyWays Shade
5. Or as Integrated in Primary Play Structure's vendor.

J. Submit shop drawings and product data for approval

K. Basketball Equipment
1. Outdoor Basketball Goal
2. General Requirements
3. Comply with ASTM requirements for Sports Equipment for use in public venues.
4. Heavy-duty playground basketball hoop with steel backboard, steel double-rim goal with no-fail net-lock system, fixed height, goose neck steel pole, footing engineered to withstand loads.

L. Approved Manufactures
1. Bison Inc.
2. First Time

M. Soccer Equipment
1. Soccer Goals
2. Approved Manufacturers:
3. Elementary: Bison, Inc.
4, Middle and High School: Bison, Inc

DIVISION 12 -- FURNISHINGS

12.1 Window Covering

A. Horizontal Roller Shades for all glazed openings in exterior walls. Interior mount. Aluminum heavy gauge, Basis of Design: Texton or equivalent. Opacity: Light filtering with minimal visibility through shade, not full blackout. Color: gray tones, or matching door/window frame colors. Architect to determine which windows will receive motorized shades and coordinate with electrical to provide power and switching as needed.

1. Provide at all exterior glazed openings
2. Provide at all interior door side-lite locations
3. Provide areas where visual security/privacy may be required (Conference room, large interior windows looking into classrooms, etc.)

B. Mini Blinds are allowed for use. Corded Blinds are not permitted.

12.2 Furniture

A. Furniture is designed and purchased by DESOTO ISD under separate contracts. Architect shall request sample of district preferred furniture colors prior to confirm finish out scheme coordination.

B. At the discretion of the district, the Architect / Interior Designer may be requested to provide FF&E Services as an additional service or additional guidance.

DIVISION 13 -- SPECIAL CONSTRUCTION

13.1 General

A. Division 13 Specification items shall be identified and addressed in the DD Documents Outline Specifications

B. Construction Specifications developed in this Division shall be reviewed with the Owner.

C. Tornado Shelter construction (when required with new construction)

a. Design of Tornado shelter shall be compliant with the current ICC-500 shelter code.
b. Tornado Shelter construction shall be structural ICF walls or CMU unless approved otherwise.
c. Tornado rated windows shall be considered in limited application.
d. Tornado rated doors shall be rated per the current ICC500 Adopted code.
e. Functional Requirements of the storm shelter operation shall be located within a dedicated office located within the tornado shelter. Simple operational instructional signage shall be included.
f. Emergency services required for Tornado shelter shall be designed with consideration to ease of operation, and long-term durability.
g. On site emergency power backup system is to be a battery backup system located within its own room, not utilized for storage or office. 2 hours minimum backup time.
h. Large roll-down shutters are not allowed without approval.
i. Engage 3rd party Tornado shelter reviewer during DD phase for preliminary review.
j. Provide directional wayfinding to the storm shelter from other parts of the building.
k. Operations of the Tornado shelter shall be designed with considerations for operational efficiency, drills, and minimizing maintenance burden.
l. Coordinate with 3rd party reviewer at major design milestones as required for code compliance.

13.2 Special Construction – Storm Shelters

A. All new DeSoto ISD school buildings shall include community tornado storm shelters designed and constructed in full compliance with ICC-500 – Standard for the Design and Construction of Storm Shelters, current edition.

1. The A/E shall confirm the storm shelter scope, size, and requirements with the City of DeSoto Building Official at the beginning of each project, prior to the Scope-to-Budget (STB)

submission. Any amendments to ICC-500 adopted by the AHJ shall be incorporated into the design.

2. DeSoto ISD Emergency Management (EM) shall be included in all storm shelter design projects, as the shelter design directly affects the Campus Emergency Operations Plan.
3. A third-party structural peer review shall be procured by DeSoto ISD for all storm shelter designs. The peer review engineer shall be a Texas-licensed structural engineer independent of the EOR.

B. Structural Design Requirements

1. Storm shelter structural systems shall be designed to comply with ICC-500 for the applicable occupancy and design wind speed.
2. Minimum structural impact resistance: walls shall withstand a 15-pound 2x4 wood stud missile shot at 100 mph; roof shall withstand a 15-pound 2x4 wood stud missile shot at 67 mph.
3. All wall and roof openings (windows, skylights, louvers, and penetrations) shall comply with the same missile-impact testing requirements as the wall and roof assembly in which they are located.
4. Penetrations of the storm shelter envelope by mechanical, electrical, and plumbing systems shall comply with ICC-500. Circular penetrations greater than 2-1/2 inches in diameter and rectangular penetrations greater than 3-1/2 square inches in area shall be considered openings and shall be protected with a listed and labeled Impact Protective System (IPS) meeting the requirements of ICC-500.
5. The storm shelter structural system shall be designed for the wind and impact loads required by ICC-500. The host building structure surrounding the storm shelter shall be designed to comply with the minimum wind load requirements of ASCE 7 and IBC for the applicable Risk Category. The storm shelter shall be structurally independent from, or designed to remain functional regardless of, damage to the surrounding host building.

DIVISION 14 -- CONVEYING EQUIPMENT

14.1 Elevators

A. Elevators are required in new multilevel facilities not provided with ramps, unless exempted by the TAS and accepted by the commissioner. Refer to 4.1.3 (5) and 4.1.6; and note that alterations in existing buildings to areas with a primary function will also require this same consideration for installation of an elevator. Written exemptions from the commissioner are required to be submitted with designs. It is intended that the elevators be designed for not less than two wheelchairs and that the use be restricted to the physically handicapped and for use by stretchers for emergency responders. Do not provide wheelchair lifts for access to any levels unless the District and the State Barriers Board commissioner provide written exceptions.

B. Elevator controls shall be designed and installed in accordance with the appropriate building code; Vernon's Civil Statutes, Section 7, Article 601B, Texas Accessibility Standards; and the Americans with Disabilities Act (ADA).

C. Cab size will not be less than 20 sq. ft.

D. Elevators are used for movement between floors of books, furniture, normal school freight deliveries between floors, and floor cleaning equipment. This consideration shall be reviewed in specifying the elevator capacity requirements. The following shall be considered minimum requirements:

1. Provide 42” minimum wide door opening.

2. Provide cab size to allow for a 61” (length) x 33” (width) x 51” (height) Buffer.
3. Provide cab size to allow for an 81” (length) x 32” (width) x 46” (height) Buffer.
4. Cab size to allow for a straight entry exit without turning the equipment.
5. 4000 lb. capacity to allow for size requirements and heavy maintenance equipment. (3500 lb. is also acceptable if able to meet size constraints.)

E. A bucket sump with a pump will be provided in all elevator pits. The sump pump shall have a control switch mounted as required by current code.
F. Provide shaft lights and ladder in pit as required by codes.
G. Waterproofing of elevator pits is required, unless located fully isolated from soil contact.
H. Provide hooks and pads with elevator.
I. Provide visual emergency callout telephone in elevator cab with integrated cellular data and calling capabilities.
J. Coordinate Access system with district to provide one of the following:
1. Integration with district card access system (preferred)
2. If unable to integrate with Access control system, Provide Keyed cutoff switch in corridor outside all elevators, keyed to district’s master key system.
K. Elevator equipment rooms shall not be located under any space which has plumbing lines or fixtures above.
L. Finishes: Elevator finishes shall match the rest of the building aesthetic.
M. Elevator Type: Shall be low-rise Traction type elevator with energy recovery system with integrated battery lowering system.
N. Security Camera provisions: Provide electrical provisions for wireless camera systems, security camera not by elevator manufacturer.
O. Acceptable manufacturers: Schindler, Kone and Otis.

14.2 Vertical Lifts
A. The use of vertical lifts will require prior approval to the District prior to use. Lifts will be located in a secure space to prevent vandalism.
B. Keyed switches for lift shall be keyed to the district’s master key system.
C. The standard vertical lift shall be provided by Access Industries, model PL-TG Lift.
D. Controls shall be designed and installed in accordance with the appropriate building code; Vernon's Civil Statutes, Section 7, Article 601B, Texas Accessibility Standards; and the Americans with Disabilities Act (ADA).
E. Under no circumstances will wall mounted track and rail stair lift systems be permitted. Vertical lifts shall be enclosed in secure room with locked door at top and bottom.

14.3 Escalators
A. Escalators are not allowed without prior approval.

DIVISION 21 -- FIRE SUPPRESSION

21.1 General
A. Every effort will be made to make any new addition an integral part of the existing building rather than a separate building system. Horizontal and vertical access, including a fire lane and fire hydrant will be provided. When properly located, such access and hydrants can also provide needed fire protection for at least some of the portable classroom buildings normally found on most campuses.

21.2 Fire Protection

A. An automatic wet sprinkler system complete with flow and tamper alarms, meeting local and state requirements will be provided in all facilities receiving renovation or new construction. Provision of such a system will be reviewed by the DESOTO ISD Security Department before commencing design. Use of Victaulic couplings requires DESOTO ISD review and approval and will be avoided, if possible.
B. The method of protecting all lines from freezing will be considered and reviewed.
C. Adequate replacement hardware and storage boxes shall be provided as required by code for ongoing maintenance of all installed systems.
D. Dry-Type fire suppression systems are suitable in canopies and other open-air areas where exposure to weather conditions may make wet systems impractical.
E. As-Built drawings will be provided to the DESOTO ISD Security Department in Adobe PDF format for all installed systems upon completion and acceptance.
F. All installed systems will be properly warranted for three years from any defective components that cause damage to the facilities installed.
G. The installing company shall provide training on any control equipment associated with a Fire Pump or other devices.
H. All systems documentation shall be turned over to the DESOTO ISD Security Department upon completion of the project.

DIVISION 22 – PLUMBING

22.1 General

A. Site Visit: The design professional shall perform a site investigation at all existing facilities prior to providing scope to budget documents. At a minimum, the following data shall be obtained and documented in construction documents.
   1. Gas pressure available at meter and location of meter(s).
   2. Water pressure and location of meter(s).
   3. Flow line of sanitary sewer at potential connection point
   4. Flow line of storm sewer at potential connection point.

B. Requirements for renovation projects:
   1. Correct code deficiencies within, or affected by, the alteration area. Upgrades may be required for equipment supporting the alteration area but located outside of it.
   2. Re-use or modify existing equipment if it is in good condition, with Owner's approval. Equipment for which replacement parts are no longer available should be evaluated for replacement.
   3. All abandoned piping shall be removed and disposed of offsite. All abandoned piping that cannot be removed shall be labeled, purged and capped on both ends. Abandoned piping shall be noted on as built drawings.

C. Provide a plumbing chase between the large student restrooms of sufficient width to allow access to these areas by District personnel, through a 2' wide minimum door, where possible. Coordinate with Architect.
D. Coordinate all roofing details with Plumbing details. Roofing details take precedence over plumbing details for roofing requirements.
E. Provide connections for a washer/dryer in the custodial area.
F. General Maintenance
   1. Provide isolation valves near the main supply and return for each piping branch.
   2. In corridor locations where water lines make a turn to another corridor/room, provide cutoff valves (ball valves).

3. Locate isolation valves for all sinks at the unit, either at the wall or behind with access (ball valves). Access panels should be screwed in lieu of keyed.
4. Provide isolation valves at each restroom and should be located above the ceiling outside the restroom (ball valves).
5. All valves above ceiling should be identified by markers on the ceiling grid.
6. Provide hose bib at all exterior doors. Provide isolation valves at each hose bib. Valves should be located inside the building, above the ceiling.
7. Provide general purpose power outlet within 25' of all wall cleanouts for equipment.
8. Provide manual trap primers and trap guards for floor drains. Provide access doors for trap primers.
9. Shower room design should have perimeter wall mounted shower heads in lieu of central column shower heads.

G. Utility Management
1. Provide submeter for main water and main gas service. Submeters will be provided by Energy Management Contractor and installed by the Plumbing Contractor. Energy Management Contractor shall integrate new devices into existing District-wide Energy Management System.
2. Provide additional submeter for irrigation system that is tied into Energy Management

H. Water Softener

1. Water quality shall be tested and evaluated by a qualified water treatment/softener specialist to confirm hardness levels and determine appropriate softener sizing and configuration.

2. Where required, water softeners shall utilize a three-valve bypass installed prior to the resin tank. Resin tanks shall be constructed of galvanized steel and equipped with a steel or brass multiport diaphragm head. Brine tanks shall be plastic or fiberglass and shall incorporate dry-shelf salt storage. The system shall provide automatic bypass during regeneration. Water softener installations shall be located near an outside service entrance of the building for ease of maintenance access.

3. Softener capacity shall be sized based on measured or reported source water hardness (gpg) and peak daily domestic water demand. Softened water distribution shall be limited to domestic hot water, kitchen equipment (Division 11), and other fixtures requiring treated water.

22.2 Facility Water Distribution

A. Provide pressure-reducing valves at all facilities where water pressure exceeds 72.5 psi.
C. Provide domestic water piping to all ice machines and refrigerators with Ice Makers.
D. Domestic hot and cold water should be supplied to staff-use spaces, including science lab teaching stations and any Emergency Eye Wash Stations as required by code.
E. Cold and tepid should be provided to classrooms and other student-use locations, except for special needs program spaces.
F. Provide accessible isolation valves at all appliances and plumbing fixtures. Access panels should be screwed in lieu of keyed.
G. Where the piping length from the water heater to the fixtures is more than 100 feet, systems should be recirculating. Provide a check valve in the main return to prevent temporary reversal of flow.
H. Review all fixtures where crossflow is a possibility and provide a check valve at fixture.
I. Piping expansion joints should be accessible for maintenance.

J. Backflow prevention shall be provided as required by authority having jurisdiction.
K. All domestic water piping shall be a minimum of type L hard drawn copper. Copper used under slab shall be soft drawn copper with no joints below slab.
L. Solder: 95-1/2% tin, 4% copper and 1/2% silver.
M. Isolation valves shall be ¼ turn full port ball valves.
N. Provide water hammer arrestors on all domestic hot and cold water lines in accessible chases or with access panels.
O All first floor plumbing pipes to be in crawl space where possible.
P. Hot water tanks should maintain water temperatures at not less than 140F to prevent bacterial growth unless some other technique is used for this purpose. Kitchen equipment should be supplied with a water heating system that can deliver a temperature up to a high temperature (180F) from a separate heating system.
Q. Domestic HW Circulation pumps shall be controlled by local timeclock.

22.3 Facility Sanitary Sewerage

A. Provide floor drains (round drains with heel proof drain covers) in the following locations:
   1. Each large student restrooms (possibly more than one in each restroom).
   2. Kitchens and dishwashing areas
   3. Mechanical rooms
   4. Locker rooms
   5. In laundry rooms for washer
B. Trap guards shall be provided for all floor drains.
C. Plaster traps shall be provided on all art room sinks.
D. All sanitary sewer piping shall be schedule 40 PVC in accordance with ASTM D-2665, PVC piping in return air plenum shall be fire wrapped to accommodate flame and smoke spread ratings.
E. All underground sanitary sewer lines shall accommodate soil movement by means of a sand backfill/embedment or other method deemed appropriate by the Architect
All exposed piping in kitchen to be DWV copper. PVC piping should not be used in exposed kitchen areas.
G. Drawings and Specifications shall require that all sanitary sewer systems be smoke tested by an independent contractor hired by the General Contractor.
H. In all secondary schools science labs
   1. Provide acid waste piping as follows:
   2. Flame retardant meeting ASTM F-1412
   3. Schedule 40
   4. Mechanical joints may be used above slab. Fusion joints required below slab.
   5. Provide acid dilution basins
   6. Provide solenoid valve system emergency off push button located behind the teaching station on wall for shut off of all water and natural gas.
I. Provide grease traps for food service kitchens
   1. Refer to 1Food Service Equipment section for details.
J. In Science Labs, acid waste systems should be CPVC with solvent cement.

22.4 Gas Systems

A. To reduce maintenance, gas piping will be located underground only when necessary and shall have a dirt-leg prior to entry to the gas valve above grade.
B. Gas piping shall be run exposed on roof surfaces and supported on roof supports with corrosion resistant pipe rollers. Maintain a minimum of 6 inches to bottom of piping from finished roof surface. Paint exterior gas piping after installation with corrosion resistant

primer and severe service paint system. No exposed gas piping shall be run in buildings except for low pressure drops to individual equipment and piping within a room connecting appliances within a single area. Where gas piping must penetrate building walls, provide ventilated sleeves to the exterior. No gas piping shall be run below crawl spaces or in return air plenums.

C. Gas service riser mounted against the exterior wall shall be suitably guarded with masonry channels integrated into the wall system, so as to protect against climbing and scaling of pipe riser. The Engineer will coordinate with the Architect to develop the suitable means of protecting the pipe riser.

D. Where gas demand is high and piping runs long, 5 psi mains will be used if available.

E. Install regulators designed for outdoor use at exterior of building. A test tee with nipple and cap will be provided on each side of any regulator. Each gas piping system shall be installed so the system can be tested in accordance with the Texas Administrative Code and Railroad Commission. Provide test ports for gauges and air intake lines to pump up system, located such that the system can be tested without having to break down the gas piping. (Ref: Texas Administrative Code, Title 16, Part 1, Chapter 7, Subchapter Rule 7.74).

F. Regulator discharge shall not be less than 10’ from any air conditioning intake.

G. Unions and isolation valves should be provided on each side of each regulator.

H. A stopcock will be provided at the meter on each side of each regulator.

I. An indicating gas cock will be provided for the boiler and a "Watts" ball valve FBV-3, or equivalent, on all appropriate appliances, including science tables. Each appliance requiring gas shall have a separate cut-off.

J. At science laboratories, gas and water piping shall be provided with shunt trip solenoid valves and shutoff valves, to be controlled in each lab space (see electrical specifications). Provide gas piping to science laboratories in high school facilities only.

22.5 Piping

A. It is preferred that the following piping materials be utilized for each system:

1. Waste & vent piping, and roof and storm drain piping: Schedule 40 PVC sewer pipe for interior piping. Consideration may be given to SDR35 heavy wall PVC sewer pipe for exterior piping, but shall be limited to underground piping outside the building only. Foam core piping will not be accepted.
2. “Rain & Shine” blue PVC glue is prohibited.
3. Plumbing water piping: Type “L” hard drawn copper tubing with silver-based solder joint fittings. Interior piping: Type “K” Piping underground and under slab. Piping that must run below floor slabs on grade shall be Type “K” soft copper tubing with no below grade joints.
4. Gas piping: Black Schedule 40 steel with screwed joint fittings through 2” IPS, and welded fittings above 2”. Consideration may be given to polyethylene gas pipe per ASTM Standards for exterior gas piping, but shall be limited to underground piping outside of building only.
5. Indirect drain (condensate) piping: Type “L” hard drawn copper tubing with silver-based solder joint fittings.

22.6 Storm and Roof Drains

A. Storm drains will be sized per Desoto/Glenn Heights Plumbing Code and local authority having jurisdiction. Insulate roof drains to prevent condensation.

B. Overflow drains shall not be connected to interior drains. Extend overflow lines to discharge outside of building. All roof drainage shall be collected in an underground drain system and diverted away from the building.
C. Metering type roof drains will not be allowed. Provide relief basins or atmospheric breaks in the roof drain piping outside of the building.
D. Roof drain fixtures which cause a water build-up on the roof will not be allowed.
E. At the completion of installation, the interior of all storm drain piping shall be inspected utilizing a video camera throughout. Videotape shall be submitted to the Owner as part of the closeout documents.

22.7 Domestic Water Heating
A. High-efficiency, dedicated condensing water heaters provided for kitchens and locker rooms.
1. Tankless gas water heater for group restrooms.
2. Point of use, electric water heaters for single toilet restrooms.
3. Tempered water for elementary schools: accomplish through point of use heaters. Tempered water for middle schools/high schools: accomplish through use of dedicated tempered water loop if cost effective and practical.
B. Water Heater of preference is Navien NPE-A2 and NPE-S2 Condensing Tankless Water Heaters
C. Instantenous water heaters shall be provided for nurses' stations.
D. No domestic hot water heaters to be located on the roof or above ceilings.

22.8 Showers
A. Tempered water served by master mixing valve with cold water bypass will be provided for group shower areas.
1. Group showers shall be individual stalls only, no group serving fixtures.
B. At individual showers, provide tempered water or hot and cold water, with anti-scald shower valves.
C. Provide at least one accessible shower for each shower location. 5'min. wide roll in shower type is preferred. 3 walled 36"x36" side transfer is not allowed due to constructability tolerances.

22.9 Piping Thermal Insulation
A. Insulation will be provided for all hot water and cold-water distribution piping, hot water tail piece and trap under lavatories for the handicapped, interior drain piping, roof drain fixtures and laterals, roof drain risers in non-accessible chases and as required to prevent freezing of any pipe exposed to outside temperatures.
B. All pipes are to be labeled by function and direction of flow at appropriate intervals.

22.10 Utilities
A. Design will permit gravity drainage of sanitary sewage. Pumping sanitary sewage is not acceptable unless no other alternative exists, in which case the Architect/Engineer will review with DESOTO ISD. Where sewage ejector pumps or sump pumps are used, they will be duplex type pumps and be located to allow adequate headroom to remove the pumps from the pits.
B. Design should permit gravity drainage of storm water. Pumping of storm water is not acceptable unless no other alternative exists, in which case the Architect/Engineer will review with DESOTO ISD.

22.11 Installation Fees

A. Water and Sewer Service:

1. The Architect/Engineer shall contact the City of Desoto / / Glenn Heights or local authority having jurisdiction as soon as possible to determine the extent of work concerning the new services, to include "evaluated costs" levied by Desoto /Glenn Heights Water Utilities. DESOTO ISD will be advised of the findings and these fees shall be included in the project construction estimates. All assessment charges required outside of permit fees, etc. will be paid by contingency change authorization.

B. Gas Service:

1. The Architect/Engineer shall contact the gas company as soon as possible to determine the extent of work concerning the new service. DESOTO ISD will be advised of the findings and provide fees in the project construction estimate.
2. Locate the gas meter as close to the building as possible. DESOTO ISD prefers no underground gas lines on the customer side of the meter. Any charges by the gas company to bring service to the meter will be paid by contingency change authorization.

22.13 Plumbing Fixtures and Heights

A. The number of plumbing fixtures required will be calculated per code requirements and input from the design team. DESOTO ISD prefers the use of floor mounted toilets.

B. All plumbing fixtures should be commercial grade or better and take into consideration existing maintenance and custodial procedures.

C. Provide floor drains at all restrooms.

D. Hardwired sensor activated flush valves shall be provided. Battery operated only allowed in kitchen staff restrooms.

E. Sloan Royal 186 ESS shall be used for the urinals. Sloan Royal 111 ESS shall be used for the water closets.

F. Preferred brand of lavatory is Bradley Empire Gray Terreon wash fountain for student restrooms. Student wash fountains shall be hard wired. Faucets in gang restrooms shall be metered (T&S) or self-closing (Chicago).. Other manufacturers will require owner review and approval. Faucet for single use restrooms shall be Sloan Optima Sensor `Faucet EAF-275-SOL-CP-0.35GPM-MLM-IQ-CO-FCT

1. Infrared metered and tamper resistant with 4” center set faucet.
2. Lavatory faucet supplies: 3/8" chrome plated copper attached to a 1/2" IPS x 3/8" flare chrome plated loose-key stop.
3. All exposed chrome plated fittings polished.
4. New lavatories shall have flexible supply line only – no single faucets with rigid supply lines allowed.
5. Adjustable duration, set for 10-12 seconds
6. For durability reasons, single hole lavatories are not acceptable
7. Gooseneck faucets are not allowed for restroom lavatories.
8. Wall mounted lavatories shall be equipped with concealed arm (floor mounted) carriers.
9. If a fixture is replaced, the wall carrier shall be replaced as well.
10. Lavatories – 0.5 gallons/minute maximum

G. Recommended mounting heights for accessible fixtures are regulated by the TAS 2.1.1. When mixed groups are using the facility, contact the commission for additional information and assistance. (TAS 2.1.2)

H. If urinals are provided, comply with accessible fixture requirements of the TAS. American Standard is the preferred standard.
   1. Integral p-trap
   2. Waterless urinals should not be utilized
   3. Flush valves shall be wired, sensor-activated with manual option. Sloan or approved equal.
   4. Basis of Design – Royal 186 ESS-1.0-GJ-CP-L/OR-24V
   5. Urinals - high efficiency 1 gallons/flush

I. Provide vacuum breakers and backflow prevention devices as necessary.

J. Cleanouts to be provided in all group restrooms. 1 per 2 urinals and 1 at the vertical vent for water closets.

K. Water Closets
   1. Floor-mounted are preferred. If wall-mounted is used, it must be paired with heavy-duty (or dual) wall carrier.
   2. If a fixture is replaced, the wall carrier shall be replaced as well.
   3. Urethane Gasket Required.
   4. Flush valves shall be wired, sensor-activated with manual option. Sloan or approved equal.
   5. Basis of Design – Royal 111 ESS-1.6-CP-2-OFST-24V
   6. Water closets – 1.6 gallons/flush.

L. Lavatory Sinks
   1. All Lavatory sinks shall be porcelain.
   2. Wall mounted sinks shall be provided with appropriate carrier.

M. Wash Stations
   1. Preferred in all group restrooms
   2. Bradley, sensor activated wash stations are preferred.
   3. Basis of Design: Empire Gray, Terreon, Rectangular, 21 ½ in overall WD, STD Drain, Express (Mfr. Model S93-723)

N. Science Laboratory Sinks
   1. All sinks shall be under mount epoxy

O. Other Sinks
   1. All sinks shall be commercial grade stainless steel
   2. Wall mounted sinks shall be provided with appropriate carrier

P. Custodial Sinks
   1. Floor-basin-type 4” curb service sink with hose bib connection
   2. Industry standard faucet with supporting bracket.
   3. Nonporous seamless for ease of cleaning.
   4. Accommodate 4-gallon mop buckets
   5. Include water resistant surface around mop sink.

Q. Showers
   1. Vandal-resistant, low-flow shower heads by Acorn
   2. Stainless steel for durability
   3. Shower heads – 2.0 gallons/minute

R. Dual-Height Bubblers
   1. Wall-mounted
   2. Stainless steel
   3. Vandal resistant bubbler. Provide a flexi head and a bottle filler bubbler. Provide one bottle filler type unit at each array and distributed appropriately throughout the building.

4. Provide at each large student restroom and at other locations as requested by District or required by codes.
5. Provide floor drain below all water cooler areas.
6. Approved Manufacturers: Oasis, , Halsey Taylor, Elkay

S. Mixing valves should be digital model by Leonard, factory made or equal.

T. Emergency showers and eye wash stations shall be Bradley.
1. Cutoff valves (ball valves) to be provided.
2. Mixing valve to be located above ground with an appropriate access panel.
3. Drain shall be connected to floor drain.

U. Exterior drinking fountains are not permitted.

V. drinking fountains are not permitted in gymnasiums or in other areas with flooring susceptible to water damage.

V. Locate Drinking fountains in an adjacent corridor with a floor drain.
1. Locate an electric water cooler within special needs program areas.
2. Locate lockable hose bibs in large student restrooms, for cleaning purposes.
3. Locate frost proof hose bibs at 100' intervals along the exterior wall of the entire building.

W. If mechanical equipment is located on the roof, locate frost-proof hose bibs so that a hose bib is available within 50' of equipment for servicing. No Hose bibs shall be located over flooring susceptible to water damage.

X. Ensure adequate potable water provided at roof.

22.14 Approved Manufacturers

A. Electric Water Coolers – Halsey Taylor, Oasis, Elkay

B. Plumbing Fixtures – American Standard

C. Flush Valves – Sloan

D. Floor Drains – J.R. Smith

E. Backflow Preventers – Watts 007 or 709, Double Check: 009 or 909 RPZ

F. Mop Sink – Fiat floor mounted

DIVISION 23 -- HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

23.1 General

A. Common Work Results for HVAC
1. A page-by-page review of all MEP designs should be coordinated with DESOTO ISD leadership, as well as coordination of HVAC equipment tie-in with EMS. This review should occur before the final construction documents are issued.
2. MEP construction milestones should be incorporated into the Project Manual and Contract master schedule. These milestones will be determined during the MEP design review.
3. New school facilities shall be designed with DX/Gas packaged rooftop units as the preferred system for all areas. To be determined in design meeting discussions with DESOTO ISD personnel.
4. Packaged DX rooftops are preferred in common spaces such as gyms, cafeterias, auditoriums and large lobbies.
5. Approved RTU manufacturers are Lennox, Carrier, York

6. No variable compressors. Staged heating / cooling is preferred.
7. Administration areas shall be served by a Variable Refrigerant Flow (VRF) system with hot gas reheat. Daikin, Mitsubishi, and LG are the preferred manufacturers. Confirm final approval with DISD.
8. For admin VRF systems, outdoor air (OA) shall be provided by a dedicated outdoor air system (DOAS). Select DOAS for compatibility with VRF system and owner preference.
9. Manufacturer provided controls are not acceptable. All equipment must be controllable by third-party EMS via terminal strip.
10. No Double-Wall construction.
11. RTUs to be equipped with non-powered convenience outlets as needed to meet maximum distance requirements. Outlets to be circuited separately from the unit.
12. All rooftop HVAC equipment shall be screened.
13. PVC for condensate lines is acceptable.
14. Corridors should receive dedicated unit and not be conditioned by adjacent classroom unit.
15. Major HVAC renovations at existing facilities should be evaluated by the Design Team to determine appropriate system. The following criteria should be used: site conditions and availability, scope of renovation, existing HVAC systems.
16. Smaller/partial renovation projects should be evaluated with DESOTO ISD to determine preferred systems.
17. The existing system must be considered when determining a solution. If the existing school has a system capable of supporting the new addition it would be preferred to have the same system in the new addition. A/E to verify final selection with owner.
18. A life cycle analysis should be performed when project alternatives (that fulfill the same performance requirements but differ with respect to initial costs and operating costs) have to be compared. The analysis should include all costs arising from owning, operating, maintaining, and ultimately disposing of equipment. The alternative that maximizes net savings should be selected. This should be provided at scope to budget/schematic design on all projects that require HVAC systems to be replaced.
19. Requirements for renovation projects:
    a. Meet the standards described in this document for new projects unless noted otherwise.
    b. Include an evaluation of each piece of equipment in the renovated area which documents, at a minimum, the following:
        i. HVAC System Type
        ii. Condition
        iii. Age
        iv. Make/Model
        v. EMCS Control Type
        vi. Capacity
        vii. Area Served
        viii. Associated Equipment
        ix. Piping Schematic (if applicable)
20. Sufficient data should be gathered to provide a clear plan for demolition of systems without affecting areas that are not renovated.

21. The intention of any renovation project that involves HVAC work is to improve the thermal comfort and/or reliability of the facility without negatively affecting any other portions of the facility. Architect to evaluate the scope of the renovation with respect to the school as a whole and advise the owner of any impacts to that system that may result from the intended scope of work. Correct code deficiencies only within the alteration area. Upgrades may be required for equipment supporting the alteration area but located outside of it.
22. DESOTO ISD shall have first right of refusal of equipment. It is our intent for all equipment to be on the same life cycle.
23. Remove ductwork, piping, etc. that is not re-used. Abandoning in place is not allowed.
24. Avoid the use of roof mounted Chilled Water / Hot Water Units.
25. Provide simplified single-line schematics illustrating flows and relationships of all air and hydronic systems. Note flows and equipment control sequence on the diagram (See ASHRAE Guideline 4-1993 for requirements.). This should apply to all projects that the HVAC system is being renovated. It will require the design professional to do proper job site review.
26. Architect to provide a written statement to the effect that the Architect has provided adequate access and space for installation and servicing of all mechanical equipment. This statement should be included in all phases from schematic design until final documents to ensure proper coordination between design professionals.
27. Architect shall coordinate requirements for items requiring integration with mechanical systems but furnished in general construction and equipment furnished outside the contract.
28. All instructional spaces, gymnasiums, corridors and other common areas, and multi-purpose rooms are to be mechanically heated, ventilated, and cooled.
29. For new construction provide separate cooling systems that may be run independently for administrative areas, Music Halls, cafeterias, auditoriums, & gyms.
30. Internal heat gain by space should be based on actual occupancies specified in the District's Educational Specifications. In the absence of a firm count, the reasonably expected occupancy should be used in lieu of the Building Code maximums.
31. Sensible and latent loads for people and equipment should be based on the latest edition of ASHRAE Handbook of Fundamentals. For dining areas, auditoriums, and other high occupancy spaces, occupancy loads should represent the number of seats available. Areas not normally occupied, such as storage rooms or mechanical rooms, do not have occupancy loads. Engineers and architects should take into consideration the climate zone when selecting equipment and designing systems.
32. Outdoor design conditions must be based on weather data tabulated in the latest edition of the ASHRAE Handbook of Fundamentals.
33. Summer
    a. Dry Bulb 105°F
    b. Wet Bulb 78°F
34. Winter
    a. Dry Bulb 18° F
35. Indoor design criteria

    a. General offices, classrooms, conference rooms, toilets, lockers, communication closets
36. Summer
    a. Temperature: 72° – 74°F b. RH: 40% – 55%
37. Winter
    a. Temperature: 70° – 72°F b. RH: 40% - 55%
38. Elevator machine rooms, electrical switchgear, mechanical equipment rooms
39. Summer
    a. Temperature: 90°F (max)
    b. RH: No requirement
40. Winter
    a. Temperature: 55°F (min)
    b. RH: No requirement
41. Each IDF/MDF room to be cooled by dedicated packaged RTU (no splits).
42. The room is to have a louver in the door with a filter rack
43. Room to be mechanically ventilated to achieve 5-6 air changes per hour when the space sensor is activated.
44. Exhaust from the room shall be taken from the top of the space. Provide ducts up to the top 18” of the space if underfloor exhaust is used.
45. MDF/IDF dedicated AC Unit optimally maintaining both a set point of 70 ± 2°F. Minimum zone temp of 64F, Maximum zone temp 75F. Desired humidity range is 40-55% with allowable.
46. MDF/IDF Unit must operate 24/7/365.
47. High Efficiency filtration, sized for heat load from switches, UPS, access points, and future growth.
48. Supply air to be directed toward rack intake; avoid blowing directly onto equipment exhaust sides.
49. Install an environmental monitoring sensor with the following:
    a. Temperature & Humidity readings
    b. High-temp threshold alarms (<64F, >75F, <40%RH, >55%RH).
    c. Alerts via email/SMS/Network SNMP trap.
    d. Sensor must integrate with district NMS or Security/IT notification system.
    e. Log environmental data for minimum 30 days for troubleshooting (via BAS if monitored by said system).
50. For preliminary design heat loads, lighting levels used must be consistent with the general building lighting concept, which may consist of overhead lighting, task lighting or both. Assign room loads and return air heat gain accordingly.
51. Mechanical system shall be properly designed to meet the heating and cooling needs of the building as designed. There should be no consideration for future expansions.
52. Housekeeping pads should be at least 3" larger than the mounted equipment on all sides.
53. System design data, such as drawings, shall include descriptive and operating data for the project. The descriptions should identify the areas of the building the system serve, the expected performance readings at the design load conditions and, where applicable, at part load conditions.

54. For all HVAC equipment located above ceilings, provide blue on white letter laminated identification tags on ceiling grid below to identify unit name and number as defined by the construction documents. Tags should be laminated plastic and fastened to ceiling grid with rivets and not adhesive. Tag width to match grid width.
55. Provide, a HVAC, fire and emergency power response matrix that lists all equipment and components (air handlers, dampers, valves, etc.) with their status and action during fire alarm and under emergency power. This should be applicable to any project with HVAC renovations to insure that the equipment is being properly integrated into the emergency system(s).
56. Coordinate all roofing details with Mechanical details. Roofing details take precedence over mechanical details for roofing requirements.
57. If under floor crawl space is provided, mechanical ventilation is needed. Fans are to be controlled to provide ventilation controlled by time of day, as well as, temperature and humidity. Fan shall lockout at low temperature to prevent freezing.
58. Exhaust and supply fans shall be direct drive roof mounted.
59. Outside Air
    a. Outside Air shall be minimized by an appropriate means of air treatment as opposed to dilution. This shall be designed to meet ASHRAE 62.1-2007 – IAQ method. This will allow for minimization of equipment size, reduction in EMS complexity, and elimination of complex outside air systems.
    b. Air cleaning devices (replaces air filter) or bipolar ionization are the preferred methods ofair treatment to comply with the ASHRAE 62.1-2007 – IAQ method.
    c. An economizer cycle shall be evaluated for inclusion in all HVAC projects to meet current standards and provide cooling during off-season.
60. Efficiency
    a. HVAC unit selection should be evaluated for energy efficiency and life cycle, ensuring the purchase of the most efficient units possible, so that the maximum utility rebates are attained.
    b. Variable Speed Drives (VSD's) should be used on all pump motors and air handler fan motors where available. Even when equipment is constant speed operation, the VSD should be installed for balancing and soft-start.
    c. The efficiencies of all HVAC equipment should meet or exceed the latest version of the International Energy Code. Where equipment exists that exceeds the minimum efficiencies, an economic analysis should be performed and discussed with the Owner before selections are determined.
61. Interface with EMS
    a. BACnet interface cards should be provided for all chillers and VSD's. Information from the interface cards will be used for diagnostic purposes only. Start/Stop, Status, Speed and Alarm points shall remain hardwired.
    b. RTU – Manufacturer provided controls must be approved by the owner during design. At minimum, 3rd party EMS contractor shall be able to integrate equipment controls to the overall front-end. 51.Maintenance
    c. Maintenance of systems is critical. Units should be accessible in the following manner:
    d. For VRF Systems, it is preferred that the air handling units be located above ceiling in corridors with proper clearances for least disruptive maintenance.

e. For larger interior equipment, mechanical mezzanines are preferred, followed by mechanical rooms.
f. Filter locations shall be clearly marked on ceiling grid.
g. Proper clearances for filter changeout and coil cleaning required RTU installations

23.2 Ductwork

A. All ductwork shall be externally insulated except as follows
1. First ten feet of the supply and return duct from roof mounted equipment through the roof
2. Where duct lining is recommended for sound attenuation

B. All ductwork at gymnasium will be dual wall insulated spiral pipe with drum louvered supply air grilles.

23.3 Piping

A. All chilled and hot water piping shall be insulated with fiberglass insulation with factory applied all service jacket.
B. Exposed piping below twelve feet above finished floor shall have a PVC elbows and jacketing
C. Outdoor piping shall have a metal jacket and heat trace.

23.4 Acceptable Systems

A. Alerton (Climatec), Reliable (Environmatic Systems),
B. New projects will be added to the existing web-based front ends. Graphics shall be integrated into the existing platform in use by the District.
C. For existing buildings, new components should connect to or expand the current system at the building. Do not install multiple systems at the same campus.
D. When installing new equipment and controls, provide new BACnet controllers.
E. When performing EMS work at a facility, the preference is to replace all pneumatic controllers and/or devices.
F. Utilize new electronic devices (actuators, valves, dampers, sensors, etc.). No pneumatic devices should be installed.

23.5 Thermostats

A. Thermostats should have digital display that can be range-limited through front end. Touch screen or buttons for setpoint adjustment.
B. Override buttons are required for thermostats located in Cafeterias, Libraries, Gyms, and Administration Areas. Override to require PIN code when available.

23.6 Utility Metering

A. For new construction, utilize the meter provided within Electrical Switchgear through an interface (BACnet preferred). Metering Contractor shall coordinate with Electrical Contractor for integration requirements.
B. For new construction, utility submeters for gas and water services should be included in the project by the EMS Contractor.
C. For existing facilities, utility submeters for electric, gas and water services should be included in the project by the EMS Contractor.
D. EMS should integrate the utility submeter data into a graphics page at the Owner's direction.

23.7 Lighting

A. Outside lighting shall be controlled through the Energy Management System. No mesh-style exterior/parking lot lighting systems allowed.

23.8 HVAC

A. HVAC unit selection should be evaluated for energy efficiency and life cycle, ensuring the purchase of the most efficient units possible so that the maximum utility rebates are attained.

B. Outside Air ventilation shall be designed in accordance with ASHRAE 62.1 - Demand Control Ventilation

C. Where possible, install BACnet interface cards on chillers and VSD's to capture diagnostic data through the EMS. Hardwired points for start/stop, speed, status and alarm shall be included. Interface cards shall be utilized for diagnostics only.

D. All exhaust fans within the facility should be controlled by the EMS unless exempted by Owner.

E. Cooler & Freezer temperatures to be monitored and alarmed by EMS.

23.9 Utility Management

A. Provide submeter for main water and main gas service. Submeters will be provided by Energy Management Contractor and installed by the Plumbing Contractor. Energy Management Contractor shall integrate new devices into existing District-wide Energy Management System.

B. Provide additional submeter for irrigation system that is tied into Energy Management System for monitoring purposes. Provide motorized isolation valve at irrigation main that can be controlled by Energy Management System.

23.10 Commissioning

A. EMS shall be installed and commissioned in all buildings.

B. After completion of the installation, EMS Contractor shall place the system in operation and shall perform all necessary testing and debugging operations of the EMS.

C. Commissioning shall include point-to-point verification by the EMS Contractor on Owner approved forms.

D. Commissioning shall include the requirements for the vendors to provide training to the district personnel. It shall include electronic recording of the training. This shall be provided within the close out documents

E. Additional Commissioning requirements may be included on a project-by-project basis.

23.11 Graphics

A. EMS graphics shall be included for each project.

B. Navigation should start at an overall district page with facility names.

C. Navigation to each facility should start with a floor plan of the facility.

D. Information within the graphics should conform to the district Standard Graphics

23.12 Facility Fuel Systems

A. Gas piping entering the building is preferred to be above grade with a self-tightening swing joint prior to entering the building and must be protected from accidental damage by vehicles, foundation settling, or vibration.

B. Gas should not be piped through confined spaces such as trenches or unventilated shafts.

C. Diaphragms in gas piping must be vented to the outside.

D. Gas piping

1. Above the slab and within the interior of the building
2. Standard Weight
3. Schedule 40 black steel pipe
4. Malleable iron fittings
5. Conform to ASTM A-53

E. Outside of the building and below grade
1. Polyethylene gas pressure pipe
2. Fitting with fused joints

F. Corrugated steel piping sleeved with schedule 40 PVC may be used in concealed locations such as walls or casework.

23.13 Air Distribution

A. Air distribution systems sound power ratings
1. Classrooms and other core learning spaces: NC-30 or less
2. Ancillary spaces: NC-40
3. Administrative Offices: NC-30
4. Utilize sound-traps or insulated ductwork as required to meet the Air distribution systems sound power ratings.
5. Special attention should be made to minimizing the transfer of sound through air supply and return systems in office and performing arts areas. Specify that sound measurements shall be required to verify compliance.

B. Design ductwork with a minimal number of bends.

C. Where mitered elbows must be used, provide air foil turning vanes.

D. Size supply air ductwork using the static pressure regain method. Return ductwork may be designed using the equal friction method.

E. Air flow diversity should be a sizing criterion. Full diversity can be taken at the air handling unit and decreased the farther the ductwork is from the source until no air flow diversity is taken for the final third of the system.

F. Ductwork should be fabricated from galvanized sheet metal except for special systems that require stainless or black steel.

G. Flex duct may be used for low pressure ductwork downstream of the terminal box in classroom or office spaces. The length of the flex ducts should not exceed the distance between the terminal box and the diffuser plus 20 percent or 5 feet, whichever is shorter, to permit relocation of diffuser in the future while minimizing replacement of ductwork.

H. Flex duct runs should not contain any bends.

I. No exterior ductwork allowed.

J. Supply air diffusers with good throw performance over a wide range of discharge velocities are required to facilitate good mixing of supply and room air without short-circuiting or dumping and causing objectionable draft.

K. Ceiling plenum supply shall not be used as it does not permit adequate control of and cleanliness of supply air.

L. Ceiling return plenums must not be used in laboratories and are discouraged in all other applications. Fully ducted return-air systems are preferred.

M. The use of corridors as a return air path is prohibited by code in new buildings and should be eliminated in existing facilities where possible.

N. When designing a VAV system, one VAV box shall be provided for each classroom.

O. All fan powered VAV boxes should have filter grilles.

P. For each VAV box, the maximum airflow setting is determined by the design cooling load of the space and the minimum setting is normally determined by the space ventilation requirement.

Q. Static VAV boxes are preferred due to maintenance concerns with motors in fan-powered VAV boxes. Fan- powered VAV boxes may be required for existing facilities without the ceiling plenum area for larger duct sizes, or for 2-pipe VAV systems with electric heating. Ensure that electric heating is adequately sized for the space heating requirements (sole source of heat).

R. Locate outside air intakes away from boiler exhausts, sewer vents, cooling towers, and areas subject to car and truck traffic. See mechanical code for distance of separation.

S. If possible, return air fans should not be used. If needed, review application with DESOTO ISD.

T. All systems shall be designed for demand control ventilation.

X. Dehumidification shall be designed as an integral part of the HVAC system. Special attention should be given to provide appropriate ventilation in all spaces containing gas- fired equipment (e.g. boilers).

Y. The following spaces must be kept under negative pressure relative to surrounding building areas
1. Restrooms
2. Showers
3. Locker rooms
4. Kitchens
5. Special needs areas
6. Dishwashing areas (relative to the kitchen)
7. Dressing rooms (associated with high school theater and dance programs)
8. Science labs
9. Nurses areas
10. Laundry rooms

23.14 Exhaust

A. Provide separate exhaust hoods/exhaust systems
1. Open Skillets
2. Cooking ranges
3. Dishwashers in kitchens

B. Kitchen exhaust systems
1. Kitchen ductwork must be concealed. Concealed duct may be of black iron
2. Provide drains at low points

C. Separately exhaust spaces where hazardous gases or chemicals may be present
1. Garages
2. Housekeeping/laundry areas
3. Science laboratories
4. Laboratory Prep rooms where hazardous gases or chemicals are used
5. Art rooms
6. Shops of any kind
7. Copying/printing rooms
8. Janitor closets

D. Exhaust ductwork should be of stainless steel, in accordance with the type of fume expected and compatible with the functional process needs. Crawl space, Kitchen, and locker room general exhaust may be aluminum.

E. Ventilate vertical shafts carrying gas piping at top and bottom to prevent leaked gas from accumulating.
F. Crawl spaces shall be provided with ventilation systems to control humidity levels. Ventilation activation shall be based on temperature in the crawl space.
G. Louvers for mechanical room ventilation must allow adequate combustion air for boilers. Freeze protection should be a consideration when sizing and locating louvers.
H. Auditorium (high schools with theater and dance programs)
    1. Locate ductwork high above lighting and away from theatrical equipment
    2. Do not aim air down toward the stage or allow air flow to disturb stage curtains.
    3. Ductwork not visible to audience is preferred
    4. Provide conditioned air in light and sound control booth
I. All restrooms should have operational exhaust fans controlled by a common switch for both lights and fan.
J. Fans located in windows or exterior walls should be replaced in the same location in an aesthetically pleasing manner. Avoid additional roof penetrations or extensive ductwork.
K. In laundry areas provide exhaust vent for dryer. Venting distances should be minimized.
L. Provide booster fans, if necessary.
M. All ductwork at gymnasium will be dual wall insulated spiral pipe with drum louvered supply air grilles.

23.16 Air filtration
A. Provide in every air handling system.
B. Construction Documents to require General Contractor to replace Filter media at substantial completion in areas affected by construction.
C Design around minimum MERV 13 filtration rating or higher for improved Indoor Air Quality.

23.17 Decentralized HVAC Equipment
A. RTU – Manufacturer provided controls must be approved by the owner during design. At minimum, 3rd party EMS contractor shall be able to integrate equipment controls to the overall front-end.
B. Provide a separate HVAC system (RTU with gas heat) for each area which is to be separately zoned for operation only when required in these areas: auditoriums, cafeterias, multi- purpose rooms, gymnasiums (and supporting areas), kitchens, media centers, MDF/IDF closets, and administrative areas.
C. The design of the mechanical systems that support the technology systems must address 24-hour utilization. Cooling, heating, and humidity control for MDF/IDF closets must be independently thermostat controlled and not be affected when facility HVAC operations are shut off.
D. Cooling units for MDF and IDF closets shall be sized based on network equipment to be installed.
E. Location of HVAC units and piping must consider potential leakage and protection of network equipment.
F. Do not locate HVAC units in MDF/IDF closets where they obstruct access to any network equipment.
G. For calculation of cooling and heating loads unless otherwise specified.
    1. Typical classroom
H. 5 computers in elementary schools
I. 7 computers in middle and high schools
J. 1 to 2 printers

K. LCD projector or IWB
    1. Offices
L. Computer
M. Printer
O. TV
    1. Computer labs
P. Up to 33 computers
Q. 4 printers
R. LCD projector
S. Show routing of drain lines for DX equipment away from classroom spaces, etc.

DIVISION 26 -- ELECTRICAL

26.1 Common Work Results for Electrical

A. A page-by-page review of all MEP designs should be coordinated with District leadership for every project. This review should occur before the final construction documents are issued.
B. MEP construction milestones should be incorporated into the Project Manual and Contract master schedule. These milestones will be determined during the MEP design review.
C. Correct code deficiencies only within the alteration area. Upgrades may be required for equipment supporting the alteration area but located outside of it.
D. Acceptable Power Distribution Manufacturers: Cutler Hammer, and Square D
E. Re-use or modify existing equipment if it is in good condition with owner's approval. Equipment ten (10) years old and older shall be evaluated for replacement. Equipment for which replacement parts are no longer available shall be evaluated for replacement. Remove equipment, wiring, conduit, etc., that is not re-used, back to source or active circuit breaker in lieu of abandoning in place, unless removal is not practical.
F. Conduit should be suspended from the building structure, not from lay-in ceiling suspension system or similar means.
G. Avoid Conduits being placed under the floor slab at slab on grade or slab on void systems.
H. Flexible conduit may be used only for final connection to equipment and fixtures, with a maximum 6' length.
I. Aluminum wiring shall not be used unless approved by owner.
J. All HVAC equipment shall be on separate circuits and on separate panels from other loads.
K. Exit and emergency egress lighting shall be connected to a dedicated emergency branch circuit only serving emergency lighting in the area.
L. When required due to impenetrable wall construction, raceways may be utilized in computer labs. Raceway shall be designed to accommodate 20 technology outlets and 10 quad isolated ground electrical outlets. Raceways cast into the concrete floor system and raised flooring systems will not be used due to the cost. All raceways shall be installed as discretely as possible with little or no disturbance to classroom functionality or aesthetics. Limit raceways to one (1) vertical raceway per wall where possible.
M. Raceways shall be metal with tamper resistant devices. Color to match architect color scheme.

N. In MDF and IDF rooms, provide two (2) empty 1” power conduits and back boxes, with pull strings adjacent to the power outlets for the rack equipment. These conduits should be run back to the electrical panel(s) for the technology system.
O. Circuits for MDF/IDF closets, rack mounted equipment, and equipment in communication rooms (e.g. telephone switch, fire and security alarms) shall have isolated ground.
P. Dimensions and/or elevation notes are required for the placement of data and electrical outlets above science room and media center casework, at auditorium stages, for special architectural elements and furniture.
Q. For new construction, provide conduits sleeved through the foundation grade beam to allow for the future extension of the electrical system to future additions.
R. Stacking of electrical closets in multi-story buildings to allow conduit, bus duct, etc. to run vertically in a straight line is preferred.
S. Locating electrical rooms next to elevator shafts should be avoided to allow better horizontal distribution of branch circuits.
T. The distribution panels for the power outlets supporting the technology system (i.e. MDF/IDF equipment, classroom computers, LCD projectors, interactive whiteboards, etc.) should not include service for any other items, such as “convenience” duplex power outlets and lighting devices. In addition, these panels should be labeled to indicate their use only for the technology systems. The circuits for the power outlets supporting the technology systems should be labeled according to the District-approved room numbering system for the facility.
U. Coordinate all roofing details with Electrical details. Roofing details take precedence over electrical details for roofing requirements.
V. Provide a connections for a washer/dryer in the custodial area.
W. Provide accessible outlets in the main hallways and corridors for clean-up and maintenance. Main electrical room should have unit heater and exhaust fan to control temperature.
X. Electrical space is dedicated space, no water piping (geothermal, plumbing, water heaters, floor sinks, etc.).
Y. Clearance space painted around panels to discourage storage in electrical rooms.
Z. Metering and Control
    1. Use BACnet interface to MSB for utility metering - voltage of each phase, amp of each phase, up to 30 points in EMS graphics
ZZ. Construction Phase Requirements
    1. Contractor to provide startup report on MSB and major distribution panels, should indicate torque on main connections.
    2. Commissioning provider to IR scan all MSB and panels, provide images in Commissioning Report.

26.2 Low-Voltage Electrical Service Entrance
A. Copper wiring only. No aluminum wiring is allowed on projects without DESOTO ISD approval.
B. Packaged electrical gear is standard and any deviation is approved prior to design.
C. No outdoor switchgear is allowed.
D. Phase protection and surge protection required on MSB.
E. New electrical services
    1. Underground
    2. 277/480 volt
    3. 3-phase

4. 4-wire

F. Service entrance equipment shall withstand available fault current. Obtain fault current information from local electric utility.

G. The electrical service size need not be increased if it is not required for the work on the current project.

H. Only one electric service per campus, except for portable buildings, is allowed. Additional services shall be allowed where the capacity requirements are in excess of 2000 amperes.

I. For new additions, back-feed the new service from the existing service.

J. Electrical service for portables shall be routed directly from the utility, rather than being routed from the existing building

K. New electrical services spare capacity for future load growth
   1. Elementary schools: 20%
   2. Secondary schools: 35%

L. Electrical underground feeders
   1. Encased in red concrete
   2. Minimum cover of 2'-0".

M. Install wiring and conduit for bringing the signal from the meter demand pulse device in the electric meter enclosure into the building for attachment to the energy management system.

O. Include conduits sleeved through the foundation grade beam to allow for the future extension of the electrical, data, telephone, fire, security, surveillance video and campus clock systems to an addition

P. For service entrance equipment sizing, assume 25 watts per square foot. New Electrical switchgear should have built-in metering capability. Submeter shall have BACnet interface to integrate into District- wide Dashboard system.

Q. For renovations to existing facilities, install submeter for main electrical service. Submeters will be provided by Metering Contractor and installed by the Electrical Contractor. Metering Contractor shall integrate new devices into existing District- wide Dashboard system.

26.3 Low-Voltage Transformers

A. K-rated Transformers or Harmonic Mitigating Transformers should be provided for panel-boards serving technology equipment.

B. Provide 200% neutrals on all dry-type transformers.

C. In auditoriums, there are located transformers outside the primary stage area to reduce noise.

D. Acceptable Manufacturers: Cutler Hammer, and Square D

26.4 Low-Voltage Distribution Equipment

A. Convenience outlets: 120 volt, 3 wire, single-phase
   1. All 120 volt receptacles
   2. Small motor loads of 1/4 horsepower or less.
   3. Mounted in a ground pin up configuration.

B. Copy machine locations: 240V, 208V and/or 120V outlets on dedicated circuits.

C. Electrical requirements of all equipment furnished by the District, such as kitchen appliances, shop equipment, etc., should be verified. Place such equipment on dedicated circuits.

D. Limit the number of receptacles on a circuit to a maximum of seven.

E. Switches and receptacles shall not be located within chalkboards, marker boards, or tack boards.
F. Restroom lights and fans to turn on from motion sensor. Key switch override to be provided to turn on fan without lights when needed. Switch and receptacle cover plates to be brushed stainless steel.
G. Switches to be ivory.
H. Isolated ground receptacles and receptacles for dedicated circuits to be orange.
I. Refer to educational specifications for quantities of wall receptacles per wall in all teaching spaces.
J. Outdoor receptacles
    1. Locate adjacent to each exterior door.
    2. Provide with vandal-resistant covers
    3. Plastic covers on exterior outlets are not allowed.
    4. GFCI type
K. Floor outlets are not permitted.
L. For classrooms in new schools, new additions, or newly renovated areas provide outlets per Multi-Media outlet location (classroom) detail.
M. All classrooms will be equipped with dual switching for controlling light levels.
N. There shall be no sharing of circuits between rooms or areas.
O. Isolated ground receptacles shall not share a neutral with other receptacles.
P. Provide one quad, isolated ground outlet at each cash register or point-of-sale (POS) register in the cafeteria of each school and the cafeteria manager's office.
Q. Power in MDF closets:
    1. Power feed for the UPS fed from the central UPS.
    2. Environmental monitoring and network gear on UPS. MDF HVAC on central UPS.
    3. Power clusters
    4. Two (2) 208vac/30amp with L6-30 receptacles. Fed from a central UPS. (confirm rack layout in room for placement of receptacles)
    5. Two (2) 120vac/20amp quad receptacles all on the central UPS.
    6. Center one power cluster on a 12-foot rack line and two 110vac/20amp quad receptacles centered on the remaining walls that are not the entry doorway wall.
    7. One power cluster for every 200 planned data ports with a minimum of two additional power clusters.
    8. Two (2) 120vac/20amp quad receptacle convenience outlets on central UPS.
    9. All receptacles are to be isolated ground circuits, with a separate wire run from each outlet back to a common, dedicated, isolated earth ground.
    10. All outlets on the UPS in the MDF shall be red. Receptacles on the UPS shall be labeled 'On UPS'.
R. Power in IDF closets
    1. Power Clusters
    2. Two (2) 208vac/30amp with L6-30 receptacles. Fed from a central UPS. (confirm rack layout in room for placement of receptacles)
    3. Two (2) 120vac/20amp quad receptacles on the central UPS.
    4. One power cluster for every 200 planned data ports with a minimum of two additional power clusters.
    5. Power cluster centered on a 4-foot rack line on the wall opposite the entry doorway and two 110vac/20amp quad receptacles centered on the remaining walls that are not the entry doorway wall.
    6. Two (2) 120vac/20amp quad receptacle convenience outlets on the central UPS.

7. All receptacles are to be isolated ground circuits.
8. All outlets on central UPS in the IDF shall be red. Receptacles on the UPS shall be labeled 'On UPS'.
9. Short-Term, 1-2 hour battery backup for IDF/MDF.

S. Put no more than three (3) quad power outlets per circuit for any location.
T. Dedicated isolated ground circuits are not required outside MDF/IDF closets unless required by code.
U. Power outlets shall not share back boxes or junction boxes with data outlets.
V. Provide dedicated circuit for DDC equipment
W. Secondary Auditoriums
1. Provide power for motorized lights in the front of house.
2. Provide electrical battens, located as directed.
3. Provide power for motorized fly system, if applicable.
4. Provide power for motorized winch system.
5. Locate controls stage right.
6. Motorized picture screen.
7. Provide power in ceiling above apron.
8. Locate controls in booth and at stage manager position on back stage right

X. Light and sound control booth: Provide power for lighting control board, sound control mixer, amplifiers, equalizers, processors, intercom system, CD player, and audio/visual projector system, as applicable
Y. Black box theaters: Provide power to stage lighting grid

26.5 Low-Voltage Distribution Equipment
A. Scene shops
1. Provide outlets for floor mounted power tools (e.g. drill press, bench sander, band saw)
2. Provide power to dust collector system
3. Provide power for air compressor
4. Provide outlets at work bench

B. General purpose outlets in corridors every 30', dedicated circuit per hallway.
C. 20A receptacles with stainless covers for general purpose outlets. Confirm color with owner per project.
D. 20A switches with stainless face plates for all. Confirm color with owner per project.
E. One circuit per classroom for general purpose outlets.
F. Provide surge protection devices for panels that serve network devices and IDF equipment in lieu of Isolated Ground circuits.
G. For Administration areas, provide one dedicated circuit per office for general purpose outlets and one quad outlet at the desk locations.
H. Provide one general purpose GFCI outlet at each exterior door.
I. Provide general purpose GFCI outlets on the roof at 50' maximum spacing.
J. Provide general purpose GFCI within 25' of restroom cleanouts for maintenance tasks.
K. No water piping/lines to be run in or above electrical and IDF/MDF Rooms.
L. No electricity to be run on the roof.

26.6 Low-Voltage Circuit Protective Devices
A. Thermo-magnetic breakers (including breakers with GFI protection) are preferred. Digital solid state circuit breakers shall not be used unless approved by the District.
B. Provide surge protectors on all distribution panelboards. Surge protectors shall be mounted as close as possible to panels.

C. Prefer to use non-fused disconnect at HVAC equipment unless the existing system dictates additional safety.

26.7 Facility Electric Power Generating and Storing Equipment

A. Provide a central UPS system at all new schools:
   1. 40 KVA or larger (sized to support the MDF and all IDFs for 1hour)
   2. Central UPS shall be serviced by the isolated-ground electrical system
   3. Located in the MDF
   4. Supply power for the MDF and each IDF. UPS shall supply power
   5. For each rack in the MDF and IDF
   6. The power outlets in the MDF and IDF rooms as noted in the 26 27 00 Low voltage systems.

B. Emergency / Backup Power
   1. Battery Backup is the preferred option for emergency / backup power.
   2. Power from battery-backup system shall power
      a. Storm Shelter power needs.
      b. MDF including UPS and HVAC
      c. IDF including exhaust Fans
      d. Medical refrigerator
      e. Intercom
      f. Telephone system
      g. Fire Alarm system
      h. Safety and Security systems

26.8 Facility Solar Power/Photovoltaic

A. Any solar power/photovoltaic system must obtain Owner approval before design. Based on the District's current energy contract, approval is needed from current provider before photovoltaic systems are designed and/or installed.

26.9 Lighting and Cathodic Protection

A. Provide simplified lightning risk assessment per NFPA 780 for new schools on individual basis.

26.10 Interior Lighting

A. Interior Lighting
   1. Classroom lighting shall be LED and not exceed 50 footcandles.
   2. Classroom lighting shall be dual switched by row (front row at teaching wall switched together).
   3. Integral battery backup for emergency lighting.
   4. Minimize the use of pendant lighting.
   5. 4100K color temperature.
   6. Power packs for occupancy and vacancy control shall be located above the ceiling directly above the switches.
   7. Fixture Preferences - Lithonia, Columbia, Metalux, Leviton

B. Gymnasiums Gymnasium lighting shall be LED fixtures and not exceed average 50 footcandles for practice and non-competition gyms.
   1. Competition gyms should meet current UIL requirements and not exceed 80 average footcandles.
   2. Fixtures should have built in motion sensors.

3. Fixtures should have wire guards and clear acrylic lens.
4. Fixture preferences – Lithonia, Columbia, Metalux, Leviton

C. Exterior
1. Exterior lighting to be controlled via local timeclock. Photocell/Occupancy control to meet energy code requirements.
2. LED should be used for all exterior lighting including wall mounted fixtures and pole mounted fixtures.
3. Pole mounted LED fixtures should have built-in motion sensors to modulate lighting levels.
4. Exterior lighting shall be 4100K color temperature.
5. Fixture preferences – Lithonia, Beacon, McGraw Edison Gleon, Gardco, LSI

D. Control
1. All indoor lighting should be controlled by vacancy sensor and low voltage switches except for corridors as mentioned below. Occupancy sensors can be considered in large spaces where vacancy sensors create issues with occupant safety and egress.
2. Dimmable lighting control is to be used in all areas.
3. Keyed lighting shall not be used in any location. Corridor lighting should be operated with occupancy sensors.
4. Touchscreen or keypad should be evaluated for common spaces such as cafeteria, library and multi-use spaces.
5. Approved Manufacturers: Wattstopper, Johnson Controls, Acuity, Lutron

E. Miscellaneous
1. No T-12 lighting or incandescent lighting shall be used in any area.
2. LED stage lighting is preferred.
3. Emergency/exit lighting should be present in each stairwell.
4. Indirect fixtures shall have dust guards.
5. Fixtures should not be installed over stairs. Install over landings only.
6. All recessed lighting shall be LED.
7. All exit lighting should be LED.

Location	Average Foot Candles	Switching	Notes
Classrooms/ Laboratories	40 not to exceed 50	Split by switching 1/3 and 2/3	Row of lights nearest teaching wall switched separately
Cafeterias	40	Split by switching 1/3, 1/3, 1/3	Row of lights nearest exterior windows switched separately
Offices	40		
Corridors	30		
Restrooms	25		

Gymnasiums (Non-competition)	35	Split by switching 1/3, 1/3, 1/3	
Gymnasiums (Competition)	50-80	Split by switching 1/3, 1/3, 1/3	Per University Interscholastic League guidelines (Note: LED high-bay lighting shall be used)
Libraries	50		
Shops	75		With task lighting when needed.
Kitchens	50		Design team to ensure foot candle level meets requirements of health code.
Exterior:	4		4 FC (all sides) out 50' from building

F. Provide distributed lighting controls system with networked gateway. Refer to Appendix 26C for additional lighting control requirements.
G. In order to comply with one of the six required additional energy efficiency package options for the 2015 International Energy Conservation Code, Desoto ISD prefers the implementation of 'more efficient HVAC equipment performance' and/or 'reduced lighting power densities'.
H. Designer to maximize natural daylighting to the extent possible.
I. Combination Occupancy/Vacancy Sensors are required by the 2015 International Energy
J. Conservation Code. Coordinate lighting sensors so they do not interfere with projections systems.
K. Lighting service in the building shall be 277-volt, balanced on all phases.
L. LED shall be used for all areas, except as noted below:
M. Stage areas: Special lighting systems to be determined on an individual basis. See additional information in Section 26 55 00.
N. Fluorescent lighting – not to be used in any capacity.
O. Refer to Appendix 26D for luminaire requirements.
P. Accent lighting shall be energy efficient, durable, and easy to maintain.
Q. Recessed Lighting shall be LED type.
R. Use lighting fixtures suitable for the space and environmental conditions in which they will be installed.
S. Lighting in stairwells
    1. Wall-mounted.
    2. Center above landings.
    3. Avoid placing fixtures above stair runs. Consideration should be given to accessibility to change light bulbs or lamps.
    4. Consider LED lighting in difficult to reach locations to ease maintenance requirements.
T. Emergency lighting
    1. Use two-lamp, LED, wall-mounted "bug eye" fixtures.
    2. Vandal resistant housing.

3. Mounted as high as possible to avoid damage.

U. Exit lights
1. LED Vandal resistant housing.

V. Stem-mounted fluorescent fixtures are allowed.

W. Lay out lighting in equipment rooms so as not to interfere with equipment.

X. The orientation and control of lighting is to be addressed to prevent glare on TV screens, projection screens, interactive whiteboards, computer and room monitors in classrooms and other assembly areas (cafeterias, auditoriums, multi- purpose rooms, gyms, media centers, etc.)

Y. All classrooms will be equipped with dimming capabilities and at minimum dual switching for controlling light levels to meet code requirements.

26.11 Special Purpose Lighting (High Schools with Theater and Dance Programs)

A. Auditorium
1. Dimmer System:
I. Located in control booth or electrical closet near control booth
2. Lighting
I. Cyclorama
II. LED
III. Fourth Electric
3. Front of House
I. 32 source fours or LED ellipsoidal
II. Career Pathways: 6 motorized lights with additional capacity
4. Above Stage
I. 36 Panels and 12 ellipsoidal
5. Dance Lighting
I. 3 side floor pockets on each side of stage
II. 3 side floor pockets across front of stage
III. 3 side floor pockets along backstage wall
V. 3 dimming circuits each
VI. 3 non-dimming circuits per pocket
6. House Lights
I. LED
II. Controlled by stage manager and/or control booth
7. Follow Spots
I. Balcony or above booth
8. Provide ample LED work lights
9. Locate blue or red running lights on backstage walls
10. Curtain Warmers
I. LED
II. Grouped on single circuit

B. Light and sound control booth
1. Lighting control board
2. Dimmer rack

C. Illuminate downstage 1/3 of stage from front of house position

D. Provide capability to control/dim house lights

E. Provide capability to control lights backstage an in light and sound control booth

F. Black Box Theater
1. Provide full dimming rack; coordinate dimming rack equipment with lighting fixtures as provided.

G. Dressing Rooms
1. LED lighting only

26.12 Exterior Lighting
A. LED fixtures only.
B. With exception to athletic field lighting standards shall be a maximum of 30' tall, steel non-tapered, 5" square with cross arm brackets configured as appropriate, and watertight access hand-hole at base, large enough to accommodate wiring connections and fuses.
C. All surfaces of standard and cross arms shall be galvanized, with dark bronze coating.
D. Wall-mounted fixtures will be acceptable along the other exterior facades. Mounting height should be a minimum of 10’- 0" above the finished grade.
E. Follow IES recommendation for level of exterior illumination.
F. Avoid locating light fixtures on the ground where they would be susceptible to water infiltration and vandalism, except if rated for such use by a reputable manufacturer.
G. Minimize light pollution from the site by using full cut-off fixtures and shielding.
H. Parking lot and exterior security lighting
1. Circuit separately from other building loads
2. Parking lot lights may be controlled via BMCS or time clock/photocell but must be controlled in accordance with the requirements of the applicable International Energy Conservation Code.
K. For building additions
Add additional exterior lighting to existing photocell and/or time clock parking lot lighting circuits in accordance with the requirements of the applicable International Energy Conservation Code.
L. Avoid projecting and flat-top fixtures (due to concerns about the nesting of birds).
M. Avoid locating light fixtures in covered walks where they might easily be damaged.
O. LED Lighting is the preference for future Stadium Lighting

DIVISION 27 -- COMMUNICATIONS

27.1 General Requirements
A. Provide a standards-based structured cabling system supporting voice, data, AV, and security systems. Preferred manufacturers: Panduit or Leviton.
All installations shall comply with:
1. ANSI/TIA-568
2. ANSI/TIA-569
3. ANSI/TIA-606-C (labeling)
4. ANSI/TIA-4966-A (education facilities)
B. Cabling Infrastructure
1. Horizontal Cabling:
I. CAT6A (F/UTP or U/UTP)
II. Maximum 90m permanent link
Backbone
I. OM4 multimode fiber and OS2 single-mode fiber
II. Single-mode fiber recommended for future-proofing
Pathways
I. Cable trays/conduits sized with 40% spare capacity
II. Maintain bend radius and plenum compliance
C. Outlet Requirements