INTRODUCTION

1.1 Bulletins are issued as supplemental directions as necessary between complete Design Guideline revisions. Revisions made by bulletin will be incorporated into the next revised issue of the Guidelines

DIRECTIONS

2.1 Bulletin #1 is issued to revise the following:

1) Door Hardware requirements as outlined in Section 8.
2) Security camera requirements as outlined in Section 28.
3) Athletic and Recreational Surface requirements as outlined in Section 32.
4) Site Irrigation section added under Section 32.

Items deleted by this revision are struck through, ~~ITEM~~ and new items will be underlined, ITEM. A new Guideline issue will remove struck through items and remove underlines from the previous issue. The new issue will then follow the strike through, underline process listed above.

These revisions are to take effect immediately for all projects that have not completed the schematic design phase.

2.2 ACCEPTABLE MANUFACTURERS AND INSTALLERS – “or Approved Equal”
Where specific product manufacturers and models are mentioned, an equal equivalent will be considered following an official submission of product literature to the authorized assigned SAISD Project Manager in accordance with approved project substitution procedures, prior to installation.

2.3 ***As a Disclaimer, changes to these guidelines are not meant to be retroactive on active projects that have been designed prior to these revisions without written approval by the assigned SAISD Project Manager.***

ATTACHMENT (S)

CSI MasterFormat
Section No.Title

08 71 00	Door Hardware	VERSION 1.1
28 10 00	Electronic Access Control	VERSION 1.1
28 13 00	Intrusion Detection System	VERSION 1.1
28 23 00	Video Surveillance Systems	VERSION 1.1
32 18 00	Athletic and Recreational Surfacing	VERSION 1.1
32 84 00	Site Irrigation	VERSION 1.1

SECTION 08 05 00

OPENINGS COMMON WORK RESULTS

GENERAL

1.1 ***All door hardware to be approved by assigned SAISD Program Manager in coordination with SAISD Police Department and ~~Lock~~ Safety & Security Department.***

1.2 Doors at mechanical and electrical equipment rooms shall be fire-rated (at least 20 minutes) as an SAISD minimum, even when not required to be rated by code.

1.3 Typical interior doors shall be 3'-0" wide x 7'-0" high and 1-3/4" thick made with a high pressure decorative laminate and a bonded particle core. Doors shall receive lock blocking and reinforcements for exit devices.

1.4 Overhead rolling fire and counter doors shall be motor operated unless approved by SAISD Program Manager.

1.5 Skylights are not the preferred method for introduction of daylight to the building interior. ***However, to promote creativity and innovation in 21 Century Learning Environments, SAISD is open to the use of non-traditional materials and systems. All materials, systems and applications must be presented to the SAISD project team and approved before use.***

1.6 Skylights with unconventional shapes, problematic flashing requirements or low slopes are no the preferred designs – limit use to avoid leaks.

1.7 Lock core keying schedules should be as simple as possible and must fall under the SAISD great grand master for all SAISD locks.

1.8 All exterior glazing shall be double glazed 1" insulated glazing system. ***District preference is Solarban® 60 "Solargray" manufactured by PPG Industries, other selections may be submitted to the SAISD program manager for review.***

1.9 Primary Exterior entry door and frame options are aluminum storefront system and aluminum frames. Secondary entries may be hollow metal doors with glazing panels with hollow metal frames. Finish of aluminum frames may be clear anodized or bronze.

1.10 Windows should be visible from adjacent properties to avoid the need for security screens.

1.11 Consider shading windows to help prevent solar heat gain. Refer to the local jurisdictional authority for the minimum Solar Heat Gain Coefficient (SHGC) requirements for all exterior glazing.

1.12 Refer to Section 08 80 00 for windload and impact resistant design requirements. All glass shall comply with maximum center of glass deflection as required by ASTM.

1.13 Interior glazing shall meet code, i.e. tempered, mirror or non-wire fire-rated glass.

1.14 Provide phenolic window sills for interior windows.

1.15 ***Ensure all hollow metal doors are primed and ready for paint.***

1.16 ***For all major renovations, all existing door hardware should be replaced and should***

match new construction hardware. The architects should note in their specifications for the contractor to return all existing cores and hardware to SAISD Lock Department.

1.17 ***All components of door hardware should be able to be replaced for repair and maintenance.***

1.18 ***When replacing door hardware in an existing door, provide appropriate repair of door to accommodate new hardware. Patch or cover all holes.***

1.19 ***To ensure proper core change coordination, a meeting should be scheduled with SAISD Program Manager and team.***

1.20 ***The architect should specify kick plates to both sides of all learning center doors. Require the bottom of the plate to align with the bottom of the door.***

1.21 Minimize glazing to ensure window-to-wall rations are within the percentages allowed through the prescriptive pathway under the most current iteration of the International Energy Conservation Code (IECC). Glazing should be limited on eastern, western, and southern orientations unless overhangs or dedicated shade structures are provided to mitigate against solar heat gain.

1.22 All openings around door and window frames shall be well sealed to prevent against infiltration of air and moisture. This should include sealing gaps with backer rod followed by caulking or expanding foam to ensure a continuous air and moisture-tight seal.

TABLE OF CONTENTS

SECTION 08 14 16

FLUSH WOOD DOORS

GENERAL

1.1 The architect should include in this section: furnishing and installing interior wood doors, factory fitting to frames and factory preparation for hardware and factory finishing of wood doors.

1.2 QUALITY ASSURANCE:

A. Comply with the requirements of the following standards unless otherwise specified.

1. AWI Quality Standard: "Architectural Woodwork Quality Standards" for grade of door, core, construction, finish, and other requirements.
2. WDMA Quality Standard: WDMA I.S.1-A "Architectural Wood Flush Doors."

B. Provide wood doors that comply with NFPA 80, that are labeled and listed for ratings indicated by a testing and inspection agency acceptable to authorities having jurisdiction, based on testing according to building code authorities having jurisdiction. Provide required label on each door and panel.

1. Provide UL approved 5" deep structural composite lumber top rail reinforcement suitable to hold surface mounted closers with 1-1/2" x No. 12 fully threaded wood screws without the use of through-bolted fasteners.
2. For door assemblies exceeding sizes of tested assemblies, provide manufacturer's certificate stating that doors conform to all standard construction requirements of tested and labeled fire door assemblies except for size.
3. At stairwell enclosures, provide doors which have a temperature rise rating of not more than 450º F (232ºC) maximum in 30 minutes of fire exposure.
4. Provide fire-rated doors with fire-retardant stiles matching face veneer that are labeled and listed for kinds of applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals.

1.3 Require manufacturer's written guarantee as specified, agreeing to repair or replace defective doors which have warped (bow, cup, or twist) more than 1/4" in a 42" x 84" section, delaminated, or which show photographing of construction below in face veneers exceeding 0.01" in a 3" span, or do not conform to tolerance limitations of referenced quality standards. The guarantee includes refinishing of defective doors. Guarantee period for solid core interior doors shall be for life of original installation.

PRODUCTS

2.1 DOOR CONSTRUCTION, GENERAL

A. Adhesives: Do not use adhesives containing urea formaldehyde.
B. Use particleboard made with binder containing no urea-formaldehyde resin.
C. Doors for Transparent Finish: Comply with the following requirements:
   1. Grade: Premium.
   2. Construction: Five plies with stiles and rails bonded to core, then entire unit abrasive planed before veneering.
D. All doors shall have structural composite lumber stiles and rails meeting WDMA T.M.-7.
E. Vertical Edges: Exposed crossbands not permitted.

2.2 FLUSH SOLID CORE WOOD DOORS; WOOD STAVE CORE:

A Bond: Type II water-resistant.

B. Core: Incombustible mineral. Provide UL approved 5" deep structural composite lumber top rail and lock block reinforcement.
C. Crossband: Minimum 1/8 inch thick composite board.
D. Face Panels: Manufacturer's standard 2 or 3-ply face panels.
E. For transparent finish doors, provide manufacturer's standard thickness face veneers per AWI Grade AA faces, quarter sliced White Oak, to match non-rated doors in the same area. Match for color and grain at veneer joints.
   1. Vertical Edges: Same species, cut, and color as face veneer; no finger jointed material permitted.
   2. Finish: Shop finished as specified herein.
F. Ratings: As indicated in Door Schedule found in drawings.

2.3 MISCELLANEOUS FABRICATION REQUIREMENTS:
A Provide transom and side panels which match quality, rating, and appearance of associated doors.
B. Factory cut and trim openings. Comply with requirements of referenced standards for each door type.
C. Provide moldings and glass stops of same species as face veneer at non-fire rated doors and at fire rated doors provide manufacturer's standard wood-veneered steel beads matching veneer species of door faces and accepted for use in doors of fire rating indicated.

2.4 PREFITTING AND PREPARATION FOR HARDWARE:
A Prefit and premachine wood doors at factory.
B. Comply with tolerance requirements of WDMA I.S.1-A for prefitting. Machine doors for hardware requiring cutting of doors. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame shop drawings, DHI A115-W series standards, and with hardware templates and other essential information required to ensure proper fit of doors and hardware.

2.5 SHOP FINISH:
A Prefinish transparent finished wood doors at factory or finishing shop by door manufacturer. Provide manufacturer's finish system with appearance and performance equal to requirements of 3 sealer coats, 2 topcoats, plus stain.
B. Effect: Filled finish.
C. Sheen: Satin.
D. Finish top and bottom edges of doors with 2 coats of sealer plus 1 coat of gloss coating.

EXECUTION

3.1 INSTALLATION:

A. Condition doors to average prevailing humidity in installation area prior to hanging, and in accordance with referenced standard.
B. Install wood doors in accordance with manufacturer's instructions and as shown.
C. Install fire rated doors in corresponding fire rated frames in accordance with the requirements of NFPA Number 80. Provide clearances complying with the limitations of the authority having jurisdiction.
D. Fit to frames and machine for hardware to whatever extent not previously worked at factory as required for proper fit and uniform clearance at each edge.

END OF SECTION

SECTION 08 14 23

PLASTIC LAMINATE FACED WOOD DOORS

GENERAL

1.1 The architect should use all applicable references, codes and National industry standards to specify and complete work performed in this division.

1.2 Require a warranty for the work specified for lifetime replacing, including cost of rehanging and refinishing, at no cost to Owner, wood doors exhibiting defects in materials or workmanship including, warp in excess of 1/4 inch as defined by AWI, warp or twist to a degree that door will not operate properly, delamination of face and telegraphing or show through of stiles, rails, or core greater than 0.01 inch in any 3 inch area.

PRODUCTS

2.1 Where products are named in the design guidelines, they are considered basis of design. Other approved manufacturers must have a minimum of five years experience manufacturing products meeting or exceeding the guidelines to be considered.

2.2 MATERIALS

A. The 1-3/4" flush interior non-rated wood door should be made up of 3-ply AWI PC-HPDL-3 High Pressure Decorative Laminate (HPDL), bonded 32lb per cubic foot particle core, bonded 1-3/8" stile and 1-1/8" min. rails abrasively planed as an assembly prior to laminating, factory machine and fit. Structural lumber cores are required at doors with more than 40 percent of door core removed due to light or vent cutouts or doors with exit devices.

B. Flush interior fire rated wood doors should meet the above requirements and should be scheduled to be fire-rated, receiving the appropriate label, with a 20 minute rated core.

C. In addition to meeting the above requirements the doors shall receive the appropriate fire- rated label (45, 60, or 90 min), shall contain an asbestos free incombustible mineral core, positive pressure category A, and shall contain 7-inch top-rail blocking, in doors indicated to have closers, 5-inch bottom-rail blocking, in doors indicating armor plates and 5-inch mid- rail and corner blocking, in doors indicated to have exit devices.

D. Accessories:

1. Glazing should be factory applied and should be compatible with positive pressure requirements.
2. Glass stops, where needed, shall be metal type painted to match door frame. Stops prepared for countersink require tamper proof screws.
3. Adhesive should be type 1, hot pressed
4. The top, bottom and cut surface of openings should be sealed at the factory with two coats of varnish. Vertical door edges shall be factory painted to match door face. Factory shall supply matching paint and edges shall be touched-up in field.

E. Fabrication:

1. Factory machine doors for hardware that is not surface applied complying with hardware schedules, shop drawings, DHI A115-W series standards, and hardware templates. Coordinate with hardware mortises in metal frames.
2. Factory machine astragals and formed-steel edges for hardware for pairs of fire- rated doors.
3. Provide concealed wiring harness and standardized Molex plug connectors on both ends to accommodate up to twelve wires to doors receiving electrified hardware. Coordinate connectors on end of the wiring harness to plug

directly into the electrified hardware and the through wire transfer hardware or wiring harness.

EXECUTION

3.1 The architect should include the following requirements in their specification and include additional directives as necessary for the project.

A. Coordinate work with door opening construction, and door and frame hardware installation.

B. Clearances:

1. Head and Jambs, meeting edges: 1/8 inch maximum.
2. Sill: 1/2 inch typically, except provide 1/4 inch clearance from top surface of carpeting.

C. Verify that frames comply with indicated requirements for type, size, location and swing characteristics and that the frames are installed plumb, level and parallel.

D. Coordinate hardware installation for proper door operation. Adjust locks and latches to engage snugly without forcing. Align hardware to function without squeaking, binding, or racking. Mortise as required for automatic door bottoms.

E. Protect doors from damage and replace doors that are damaged. Verify that tops and bottoms of doors have been sealed prior to installation, as required for warranty.

F. Interior Fire Rated Wood Doors should conform to NFPA 80, UL, and requirements of code, positive pressure rated doors should not contain trim.

G. Fire rated door assemblies with gaps in excess of 1/8 inch between door and frame will not comply with NFPA 80

H. Do not remove or paint over labels on labeled doors.

END OF SECTION

SECTION 08 33 13

COILING COUNTER DOORS

GENERAL

1.1 The architect should include in this section, motor operated steel coiling counter fire door with trim, and accessories as well as electric wiring from disconnect(s) to motor operator.

1.2 The company specializing in installing coiling counter doors must have a minimum of five years experience and be an approved by manufacturer.

1.3 The rolling counter doors shall be designed to a standard maximum of ten cycles per day and an overall maximum of 20,000 operating cycles for the life of the door and shall be constructed in accordance with testing agency requirements and shall bear a rating label in hourly rating as required.

1.4 Require a warranty for the work specified for two years against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials or workmanship.

PRODUCTS

2.1 Where products are named in the design guidelines, they are considered basis of design. Other accepted manufacturers must have a minimum of five years' experience manufacturing products meeting or exceeding the guidelines to be considered.

A. Specifications are based on products of The Cookson Company, Phoenix, AZ.

2.2 MOTOR OPERATED COILING COUNTER DOOR

A. The door shall be constructed of interconnected strip 22 gauge steel slats conforming to ASTM A653 with either a hot dipped galvanized G-90 coating per ASTM A635 finish, bonderized coating or a factory applied Thermosetting Polyurethane Powder Coating. The bottom bar shall be constructed of tubular extruded aluminum measuring 1-5/16 inch deep by 2-1/4 inch high with a double vinyl astragal on the bottom edge with the same finish as the curtain.

B. Require a fusible link.

C. Guides shall be constructed of extruded aluminum. At exterior conditions, the curtain capturing channel shall contain wool pile weatherstripping. The finish on the guides shall be the same as indicated for the curtain.

D. Brackets shall be constructed of die cast aluminum and shall be the same finish as indicated for the curtain.

E. The Barrel shall be steel tubing of not less than four inches in diameter. Oil tempered torsion springs must be capable of correctly counter balancing the weight of the curtain. The barrel shall be designed to limit the maximum deflection to 0.03 inch per foot of opening width. The finish on the barrel shall be one coat of bronze rust-inhibiting prime paint.

F. The Hood shall be fabricated from 24 gauge galvanized steel and shall be formed to fit the square brackets. The finish on the hood shall be the same as indicated for the curtain.

G. Push-up door operation shall open and close with a maximum of 30 pounds of effort utilizing finger lifts in the bottom bar, not to be used for doors over ten feet wide.

H. Push-up doors shall be secured by means of a concealed sliding bolt deadlock in the bottom bar operated by a cylinder lock. Locate one at each jamb, to be operated from inside the door and shall be master keyed to Owner's keying system.

I. Upon the activation of a smoke detection system, provide an automatic closing

device and governor to control the downward speed of the door. The door shall be operated at a speed of 2/3 foot per second and not more than twenty-four inches per second as indicated in NFPA Bulletin 80. The governor shall be fail-safe, maintenance-free, fully enclosed and warranted for the life time of the door. Once the door has closed, it should be able to be reset by one person on one side of the door only.

J. The Motor Operator shall operate at a speed of 1/2 foot per second by a totally enclosed electric motor with gear reducer, with geared limit switch and emergency push-up operation, 115 volts single phase, housed in a NEMA 1 housing and include a 24 volt control transformer, 24 volt relays and complete terminal strip to facilitate field wiring, activated by Three Button Push Button Station in a NEMA 1 enclosure.

K. Motor operated counter doors shall be secured by means of a concealed sliding bolt deadlock in the bottom bar operated by a cylinder lock, electrically interlocked to prevent the motor from operating when the door is locked. Locate one at each jamb, to be operated from inside the door, master keyed to Owner's keying system.

L. The counter door shall include a rolling door safety edge on the bottom bar of the door and shall automatically reverse the door if an obstruction is detected in the downward travel of the door.

1. The safety edge shall consist of a rubber boot attached below the bottom bar with an electrical switch secured to the back of the bottom bar. The Featheredge shall operate with air wave technology and shall not rely on pneumatic pressure or electrical strip contacts to operate properly. The safety edge shall create an air wave that shall be detected and reverse the direction of the rolling door.
2. The operation of the safety edge shall not be subject to interferences by temperature, barometric pressure, water infiltration, or cuts in the rubber boot.
3. The safety edge shall be connected to the motor with a coil cord.

M. There should be no electronic links connected directly to building's fire alarm.

1. During installation and subsequent resetting of the fire door, the releasing device's latching mechanism shall hold the door in the set position. Energizing the alarm system shall automatically set the device by releasing the latching mechanism.
2. The device shall hold the fire door in the set position until the alarm or smoke detection system is activated. Upon activation, the device shall mechanically release the fire door after a delay of not more than 10 seconds. If the alarm activation is canceled before the 10 second delay, the device shall automatically reset itself.
3. Provide an integral 4 amp hour battery that is capable of powering the release device and 3 auxiliary devices (smoke detectors, sounder strobes, etc.) for up to 72 hours. During a power outage the device shall automatically switch to battery power. If normal power is resumed within 72 hours, the system shall automatically reset itself and charge the battery. If the power outage is longer than 72 hours, the fire door will be closed mechanically.

N. If the door terminates at a countertop, the surface must be a Uniform 1-5/8 inch thickness and have a 1-1/2 hour label.

EXECUTION

3.1 The architect should include the following requirements in their specification and include additional directives as necessary for the project.

A. Coordinate the work with the adjacent work specified in other sections. Provide electrical connections as specified.

B. Fit, align, and adjust door assembly level and plumb; provide smooth operation.

END OF SECTION

SECTION 08 45 00

INSULATION TRANSLUCENT SANDWICH PANEL ASSEMBLIES

GENERAL

1.1 The architect should include in this section: Insulated Translucent Panel Assemblies; battens and perimeter closure system; aluminum structure; flashing; fasteners and accessories.

1.2 The architect should use all applicable references, codes and National industry standards to specify and complete work performed in this division.

1.3 Call for structural analysis data and calculations signed and sealed by a professional engineer licensed in the State of Texas responsible for their preparation to certify conformance with project specific design loads and governing code requirements as described herein and indicated on the drawings.

1.4 Request installer qualifications: signed by erector, certifying compliance with project qualification requirements.

1.5 Certify that system complies with specified performance characteristics and referenced standards.

A. U Value: Test report indicating that the complete assembly (Framing and Panel) has been tested in accordance with NFRC 100, and meets requirements of the specification.

B. Impact resistance:

1. Seaward Zones and Inland 1 Zones: Product Evaluation Reports showing that the system has been tested and meets the standards set forth by the Texas Department of Insurance for installations located in the Seaward Zones, and Inland 1 Zones per 2006 IBC/IRC with Texas revisions.
2. All Other Wind Zones: Repel an impact equal to 60 ft-lbs minimum without fracture or tear when impacted by a 3-1/4 inch diameter, 5 pound free-falling ball.

1.6 SYSTEM REQUIREMENTS

A. General: Conform to ICC Evaluating service acceptance criteria for sandwich panel assemblies and approved plastic panels.

B. Engineering Requirements:

1. Provide self supporting, translucent panel and aluminum structure installed over structural curbs and supports.
2. Safety factor should be 1.65 for load carrying members and 2.0 for load carrying fasteners.
3. Allowable deflection (ASTM E72): Structural members: not to exceed L/120 of the clear span and panel assemblies: not to exceed L/60 of the clear span.
    a. In addition the maximum deflections of the translucent panels shall not exceed the allowable deflection required for long term performance and warranty requirements of the translucent panel system or the requirement of ICC Evaluation Service for the translucent sandwich panels.

C. Performance Requirements:

1. Manufacturer shall configure and fabricate complete translucent panel assembly.
2. Prepare structural analysis data and calculations to certify conformance with project specific design loads and governing code

requirements concerning uplift, positive windload plus dead load, and negative windload plus dead load.

1.7 QUALITY ASSURANCE

A. Manufacturer shall be specialized in manufacturing translucent panel assemblies of type specified with minimum ten consecutive years experience. Show evidence of materials specified being satisfactorily used on at least three projects of similar size and type.

B. Erector's Qualifications: Specialized in installing translucent panel assemblies of type specified with minimum five consecutive years experience and show evidence of satisfactory completion of projects of similar size, scope, and type.

1.8 Require a warranty for the work specified against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials or workmanship

A. Defects are defined to include uncontrolled leakage of water, abnormal aging or deterioration, loss of structural integrity of panel assembly or face sheet, or delamination of face sheet from core. Warranty shall included all system components, flashing and sealants from 5 years from date of Substantial Completion

B. Translucent Facing Material Warranty (Polycarbonate and Fiberglass as applicable): Defects are defined to include fiberbloom (fiber exposure), delamination of coating from exterior sheet, abnormal cracking, abnormal aging, more than 8.0 Delta E units of discoloration, or loss of light transmission greater than 6 percent, as described herein.

a. Warranty period: 10 years non-pro rata from Substantial Completion

PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Pre-finished, factory assembled panel system consisting of flat translucent panel units, battens and perimeter closures, flashing, and related accessories installed over structural curbs and supports.

B. Physical Properties, testing shall be in accordance with the specified reference standards:

1. Water penetration: ASTM E331- no uncontrolled water penetration at a static air pressure difference equal to 20 percent of the positive design wind pressure with a minimum of 6.24 psf and a maximum of 12 psf.
2. Air infiltration: ASTM E283 - maximum air leakage of 0.06 cfm per square foot of surface when tested at static air pressure difference of 6.24 psf
3. Interior flame spread classification: ASTM E84 - Class A
4. Burn Extent: ASTM D635 – Must meet code requirements according to IBC Section 2606, 2610 and Table 1505.
5. Delamination: IBC 803.2 - Interior face sheets shall not delaminate or become detached when subjected to 200 degrees F for not less than 30 minutes
6. Color stability: ASTM D2244 - Full thickness and unaffected by abrasion or scratching. Color change not to exceed 8.0 Delta E units during 10 years of use.
7. Self-ignition: ASTM D1929 - Greater than 650 degrees F
8. Impact resistance:
   a. Seaward Zones and Inland 1 Zones: Product Evaluation Reports showing that the system has been tested and meets the standards set forth by the Texas Department of Insurance for installations located in the Seaward Zones, and Inland 1 Zones per 2006 IBC/IRC with revisions.
   b. All Other Wind Zones: Repel an impact equal to 60 ft-lbs minimum

without fracture or tear when impacted by a 3-1/4 inch diameter, 5 pound free-falling ball.

2.2 SYSTEM COMPONENTS

A. Provide one of the following options on the Project: Option No. 1 shall be translucent panel system utilizing glass fiber face sheets as described below. Option No. 2 shall be translucent panel system utilizing polycarbonate face sheets as described below. Mixing systems in a single project not permitted.

B. Insulated Translucent Sandwich Panel Units (Option No. 1) shall be architectural grade glass fiber reinforced polymer facings bonded to an aluminum grid core under a controlled process of heat and pressure to form a double-faced, self-supporting, true sandwich panel with a light transmission not less than 18 percent to 24 percent (18% to 24%), a shading Coefficient with a 0.24 minimum and a U-value, panel, tested in accordance with NFRC-100: 0.29 or better.

C. Metal Materials shall meet ASTM B221, Extruded aluminum alloy 6063-T5/T6 or 6061- T5/T6. Size and shape shall conform to requirements for structural support.

D. Exposed aluminum shall be clear anodized aluminum meeting the performance requirements of AAMA 611.

E. Translucent Glass Fiber Assembly (Option No. 1) shall have glass fiber reinforced thermoset resin polymers for facing, formulated specifically for architectural use, a grid size of 12 inch by 24 inch, a shoji grid pattern, a face sheet thickness of 0.045 interior; 0.070 exterior, an exterior face color of crystal and an interior fact color of white.

1. Panels shall be self-extinguishing.
2. Weatherability of exterior face sheets, ASTM D1435, shall pass test with and without protective coatings. Results shall be determined by the average of at least three white samples.
4. Fiber blooming, ASTM D4060, the exterior face sheet shall have a permanent erosion barrier.
5. The face sheets shall be uniform in color, free of ridges and wrinkles. Clusters of air bubbles/pinholes are not acceptable. Exterior face sheets shall be smooth, and shall not vary more than plus or minus ten percent in thickness
6. UV Maintenance, if required to maintain warranty, requires the manufacturer to perform routine scheduled inspections, and when required, shall provide recoating of exterior face sheet to maintain performance regarding weatherability and UV protection during the warranty period. Manufacturer shall certify that application of coating does not affect fire resistance.
6. Grid Core shall be aluminum I-beams with direct mechanical interlocking of muntin-mullion and perimeter. Facing material shall have full contact with bonding surface. Ferrous metals are not permitted. Fabricate to prevent variations in alignment at intersections.
7. Adhesives should be factory applied to adhere translucent facing to grid core. Adhesive bonding lines shall be straight with a neat, sharp edge, and shall cover the entire width of the I-beam. White spots at intersections of muntins and mullions shall not exceed four for each 50 square feet of panel, nor shall they be more than 3/64 inch in width.
8. Battens and Perimeter Closure System shall have a screw clamp-tight closure system. Field install aluminum battens and cap plates. The aluminum perimeter frame, including rafters, shall be self-draining of water infiltration and condensation by means of internal gutters which direct moisture to exterior.

F. Polycarbonate Panel Assembly (Option No. 2):

1. Facing should be tight cell technology extruded polycarbonate. Wide cell technology (cell size exceeding 0.18 inch) not permitted. The panel exterior skins shall be interconnected with supporting continuous ribs, perpendicular to the skins, at a spacing not to exceed 0.18 inch. In addition, the space between the two exterior skins shall be divided by multiple parallel horizontal surfaces,

at a spacing not to exceed 0.18 inch. In a cross section, the core shall be constructed of tight honeycomb or rectangular cells not to exceed 0.18 inch by 0.18 inch. Exterior face sheet color shall be clear or white, meeting energy performance requirements, and the interior face sheet color shall be white matte.

2. Panels shall be self-extinguishing.
3. Weatherability:
   a. Yellowing index shall meet ASTM D1925, not exceeding 10 points Delta Y. Light transmission, ASTM D1003, shall not decrease more than 6 percent over 10 years, or after exposure to temperature of 300 degrees F for 25 minutes (thermal aging).
   b. The interior and exterior faces shall not change color in excess of 0.75 Delta E by ASTM D2244, and shall not darken more than 0.3 units Delta L by ASTM D2244 and 0.2 units Delta Y (YI) by ASTM D1925, and shall not show cracking or crazing when exposed to 300 degrees F for 25 minutes.
   c. Panel shall be factory sealed at the sill to restrict dirt ingress.
4. Face sheets shall be uniform in color, with a ridged-line texture. Panels shall consist of a polycarbonate resin with a permanent, ultra-violet protective layer, co-extruded by manufacturer during the original extrusion of the panel and shall be a permanent part of the exterior layer. Post-applied coating or films of dissimilar materials are not permitted. The system shall require no scheduled recoating to maintain its performance or for UV protection.
5. Translucent Panel Joint System:
   a. Panel assembly thickness shall be Quadwall, 2.75 or 4 inch (as required by loading) with concealed interlocking H battens
   b. Extrude panel in one single formable length by width not to exceed 2 feet. Transverse connections are not permitted.
   c. Provide panels with integrally extruded standing seam upstands which are perpendicular to the panel face and which utilize a dry glazed double tooth grip-lock connection. Welding or gluing of upstands or standing seam, and single tooth locking mechanisms are not acceptable.
   d. Mullions shall have dry glazed profiles, using no sealant, welding, adhesives or gaskets.
   e. Concealed stainless steel retention clips, anchors and fasteners shall be used. The use of adhesives, plastic welding or sealant is not permitted. The metal retention clip shall be tested to withstand a wind uplift standard of 90 psf per ASTM E330.
   f. Free movement of the panels shall be allowed to occur without damage to the weathertightness of the completed system.
   g. Aluminum perimeter frame, including rafters, shall be self-draining of water infiltration and condensation by means of internal gutters which direct moisture to exterior.

G. Provide factory installed continuous extruded black rubber gaskets above and below translucent panels.

H. Insulation should be No. 1 Dry Class glass fiber, in density to achieve specified performance requirements.

2.3 ACCESSORIES

A. Anchors and Fasteners shall be stainless steel, as instructed by manufacturer

B. Other materials, components are to be use as required for a complete watertight and airtight installation as instructed by manufacturer.

EXECUTION

3.1 The architect should include the following requirements in their specification and include

additional directives as necessary for the project.

A. Provide structural framing and support curbs as indicated on the drawings and required by the translucent panel system manufacturer.
B. Prepare openings including isolating dissimilar materials from aluminum system which may cause damage by electrolysis.
C. Verify acceptability of structural framing and curbs for support of panel system prior to commencement of installation. Commencement indicates acceptance of conditions.
D. Erect panel systems in locations indicated on the drawings in accordance with approved shop drawings and manufacturers printed instructions.
E. After other trades have completed work on adjacent material, inspect translucent panel installations and make adjustments necessary to insure proper installation.
F. Install complete system water and air tight. Water Test: Test skylights according to procedures in AAMA 501.2.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

GENERAL

1.1 The architect should include in this section: commercial door hardware for swinging and other doors, cylinders for doors specified in other sections, electrified hardware and products furnished, but not installed, under this Section. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.

Items include but are not limited to the following:

1. Hinges - Pivots
2. Flush Bolts
3. Exit Devices
4. Locksets and Cylinders
5. Push Plates - Pulls
6. Coordinators
7. Closers
8. Kick, Mop and Protection Plates
9. Stops, Wall Bumpers, Overhead Controls
10. Electrified Hold Open Devices
11. Thresholds, Seals and Door Bottoms
12. Silencers
13. Miscellaneous Trim and Accessories

1.2 RECOMMENDED SUBMITTALS

A. Require LEED (Leadership in Energy and Environmental Design) product information and applicable program credits that are available to contribute towards a LEED Certified Level project certification.
   1. Credit MR 4.1 and 4.2: Manufacturer's or fabricator's certificate indicating percentage of post-consumer recycled content by weight and pre-consumer recycled content by weight for each Product specified under this Section.

B. Call for details of electrified and access control hardware, indicating the following:
   1. System Block Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring. Include the following for each unique electrified opening:
      a. Point-to-point system wiring and riser diagrams.
      b. Elevation diagram of each door.
      c. Operational description.

C. HARDWARE SCHEDULES submit copies of schedule in accordance with Division 1, General Requirements. Schedule to be in vertical format, listing each door opening, including handing of opening, all hardware scheduled for opening or otherwise required to allow for proper function of door opening as intended, and finish of hardware. At doors with door closers or door controls include degree of door opening. Supply the schedules all Finish Hardware within two (2) weeks from date purchase order is received by the hardware supplier.

Request a door hardware schedule prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in

DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
   a. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3.
3. Content: Include the following information:
   a. Type, style, function, size, label, hand, and finish of each door hardware item.
   b. Manufacturer of each item.
   c. Fastenings and other pertinent information
   d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule. Submit manufacturer's cut/catalog sheets on all hardware items and any required special mounting instructions with the hardware schedule.
   e. Explanation of abbreviations, symbols, and codes contained in schedule.
   f. Mounting locations for door hardware.
   g. Door and frame sizes and materials.
   h. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
      1) Sequence of Operation: Include description of component functions including, but not limited to, the following situations: normal secured/unsecured state of door; authorized access; authorized egress; unauthorized access; unauthorized egress; fire alarm and loss of power conditions.
4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication or other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

5. Closeout Submittals shall consist of:
   a. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
   b. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   c. Catalog pages for each product.
   d. Name, address, and phone number of local representatives for each manufacturer.
   e. Parts list for each product.
   f. Final approved hardware schedule edited to reflect conditions as installed.
   g. Final keying schedule
   h. Copies of floor plans with keying nomenclature
   i. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
   j. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

D. Require a keying schedule prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set

numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

E. Request maintenance data for each type of door hardware to include in maintenance manuals. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items:
   1. Approved hardware schedule, catalog cuts and keying schedule.
   2. Provide keying bitting list in paper and electronic format by registered mail directly to facility manager owner.
   3. Hardware installation and adjustment instructions.
   4. Manufacturer's written warranty information.
   5. Wiring diagrams, elevation drawings and operational descriptions for all electronic openings.

1.3 REQUIRE QUALITY ASSURANCE

A. Door Hardware Installer Qualifications: An experienced and factory trained Installer who has completed both standard and electrified builders hardware and integrated access control installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant (AHC) and 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.

C. ~~Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant (AHC) and 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~~

<u>Door Hardware Supplier Qualifications: Hardware supplier to be a qualified, Factory Authorized, direct distributor of the products to be furnished. In addition, the supplier to have in their regular employment an AHC or AHC /CDC and/or a person of equivalent experience (minimum fifteen (15) years in the industry) who will be made available at reasonable times to consult with the Architect/Contractor and/or San Antonio Independent School District regarding any matters affecting the finish hardware on this project.</u>

D. Source Limitations: Obtain each type and variety of aluminum, steel and wood door hardware from the same single source manufacturer and supplier, unless otherwise indicated.
   1. Provide electrified door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
   2. Provide standard door hardware, electrified door hardware and access control door hardware as a single sourced package from the same qualified supplier.
   3. Provide exterior door hardware from the same manufactures as the interior door hardware, SAISD Lock department to approve and will be based on the performance of existing hardware.

E. Regulatory Requirements: Comply with provisions of the following:
   1. Where indicated to comply with accessibility requirements, comply with

Americans with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:

a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.

b. Door Closers shall comply with the following maximum opening-force requirements indicated:

1) Interior Hinged Doors: 5 lbf applied perpendicular to door.

2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.

2. NFPA 101: Comply with the following for means of egress doors:

a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.

b. Thresholds: Not more than 1/2 inch high.

3. International Building Code (2018).

F. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C Positive Pressure.

G. Wind Loads: Provide door hardware with hollow metal or aluminum assemblies approved by the Texas Department of Insurance, including anchorage, capable of withstanding windload design pressures which are calculated for this project by a registered architect or engineer and is part of the construction documents per the Texas Department of Insurance, authorities having jurisdiction and the International Building Code Design Loads per section 1609.

H. Doors and Frames used in positive pressure opening assemblies shall meet UL10C Positive Pressure in areas where this specification includes Seals for smoke door.

All fire rated door shall be provided with fire rated hardware as required by local code Authority as part of the General Contractor's base bid. The hardware supplier shall verify all cylinder types specified for locking devices supplied as part of the door system with the door manufacturer and/or doors supplied.

All hardware used in labeled fire or smoke rated openings to be listed for those types of openings and bear the identifying label or mark indicating UL. (Underwriter's Laboratories) approved for fire. Exit devices in non-labeled openings to be listed for panic.

1.4 REQUIRE CONTRACTOR TO COORDINATE

A. Templates: Door Hardware Supplier, shall provide and distribute (to the parties involved) templates for doors, frames, and other work specified to be factory prepared for installing standard, electrified and access control door hardware.

B. to provide and distribute to the parties involved for templating for doors, frames, and other work specified to be factory prepared for installing standard, electrified and access control door hardware.

C. Access Control and Electrical Connections: Door Hardware supplier with door and frame supplier to coordinate the layout and installation of scheduled electrified door hardware with required connections to source power junction boxes, power supplies and security products.

D. Keying Conference: Door Hardware Supplier to conduct keying Keying conference to incorporate the following criteria into the final keying schedule document:
1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Review all lock and exit device functions when reviewing keying requirements.
4. Requirements for key control system.
5. Installation of permanent keys and cylinder cores.
6. Address the requirements for delivery of keys.
7. Address keying & cylinder stamping (identification) as required by SAISD
8. Establish method of submitting electronic format of keying systems & diagram to be produced and provided by Hardware Supplier.

1.5 REQUIRED WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of standard, electrified hardware and access control hardware that fails in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

C. Warranty Period: Two year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:
1. ~~Five years for cylindrical locksets.~~ Manual Door Closers are to have a thirty- (30) year written warranty.
2. ~~Life of Installation for mortise locks.~~ Mechanical Exit Devices are to have a five- (5) year written warranty.
3. ~~Five years for exit devices~~ Electrified Exit Devices are to have a one- (1) year written warranty.
4. ~~Thirty years for manual door closers~~. Mechanical Locksets are to have a ten- (10) year written warranty.
5. ~~Two years for electromechanical door hardware. Electrified~~ Locksets are to have a two- (2) year written warranty.
6. Continuous Hinges are to have a ten- (10) year written warranty.
7. Automatic Operator are to have a two- (2) year written warranty.
8. Five years for Thresholds, Door Sweeps, Gasketing, Perimeter Weatherstripping.

E. Extended Warranty: As requested by SAISD, provide a separate optional extended warranty and maintenance contract is required for the access control system and power assist operated openings. Version upgrades and "fix" releases to the software, beyond the general warranty time period, are available at no extra charge only if the end user is under a valid extended warranty and maintenance contract.

F. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

G. Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of door hardware and integrated access control systems suppliers and installers. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated for named products listed in Hardware Sets.
2. Sequence of Operation: Provide electrified and access control hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule.

C. Finish:

1. Generally BHMA 626 Satin Chromium
   a. Areas using BHMA 626 to have push plates, pulls, exit devices, vandal trim, and protection plates of BHMA 630 Satin Stainless Steel, unless otherwise noted.
2. Door Closers: Factory powder coated to match other hardware, unless otherwise noted.
3. Aluminum Items: Match predominant adjacent material. Seals to coordinate with frame color.

2.2 FASTENERS

A. Furnish with finish hardware all necessary screws, bolts and other fasteners of suitable size and type to anchor the hardware in position for a long life under hard use.

B. Furnish fastenings where necessary with expansion shields, toggle bolts and other anchors designated by the Architect according to the material to which the hardware is to be applied and the recommendations of the hardware manufacturer. All closers and exit devices on labeled wood doors shall be through-bolted if required be the door manufacturer. All thresholds shall be fastened with wood screws and plastic anchors. Where specified in the hardware sets, security type fasteners of the type called for are to be supplied.

C. Design of all fastenings shall harmonize with the hardware as to material and finish.

D. All hardware shall be installed with the Manufacturers standard screws as provided. The use of any other type of fasteners shall not be permitted. The general contractor shall provide wood blocking in all stud walls specified and/or scheduled to receive wall stops, No Exception.

2.2 HINGES AND PIVOTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Pivot Hinges: NOT ALLOWED.
2. Concealed rods: NOT ALLOWED.
3. Surface Rods: NOT ALLOWED.
4. ~~Hinges: Ives, Hager or McKinney~~
   a. ~~Conventional Hinges: Steel or stainless steel pins and concealed ball bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.~~
   b. ~~Three hinges per leaf to 7 foot, 6 inch height. Add one hinge for each additional 24 inches in height, or any fraction thereof.~~
   c. ~~Extra heavy weight hinges on doors over 3 foot, 5 inches in width.~~

~~d. Extra heavy weight hinges on doors with panic hardware or fire exit devices.~~
~~e. Extra heavy weight hinges on restroom, locker, gym, and other high frequency openings.~~
~~f. Outswinging exterior doors: non-ferrous with non-removable (NRP) pins.~~
~~g. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.~~
~~h. Five inch tall hinge at openings over 36 inches in width.~~

All hinges to be of one manufacturer as hereafter listed for continuity and consideration of warranty. Provide one of the following manufacturers Ives, Hager, ABH or Stanley.

a. Unless otherwise specified provide five-knuckle, heavy-duty, button tip, full mortise template type hinges with non rising loose pins. Provide non-removable pins for out swinging door at secured areas.
b. Exterior Five Knuckle Door Hinges shall be manufactured from solid stainless steel, steel or bronze base metal and provide all out-swinging doors with non-removable pins or security studs as called for in 3.02 Hardware Sets.
c. Interior Five Knuckle Door Hinges shall be manufactured from solid steel base metal, chrome plated. Furnish three (3) hinges up to 90 inches high and one (1) additional hinge for every 30 inches or fraction thereof.
d. Provide all exterior & interior hinges in a size 4½" x 4½" for all 1¾" thick doors up to and including 36 inches wide. Doors over 1¾" through 2¼" thick, use 5" x 5" hinges. Doors over 36 inches use 5" x 4½" unless otherwise noted in 3.02 Hardware Sets.
e. Were exterior or interior door hinges are required to clear the trim and/or to permit the doors to swing 180 degrees furnish hinges of enough throw.
f. Provide heavy weight hinges on all exterior or interior doors over 36 inches in width.
g. At exterior or interior labeled door's ball-bearing steel or stainless-steel type hinges shall be provided. For all doors equipped with closers provide ball-bearing-type hinges.
h. Finishes at all Interior and Exterior door hinges shall be brushed stainless steel, unless otherwise specified.

5. ~~Continuous Hinges (Stainless Steel) Hager, Pemko, Ives, McKinney, Stanley or Select.:~~ Conventional hinges shall comply (but not limited) to the following.
   a. Continuous Hinges: ~~Geared-type aluminum at exteriors~~. Steel or stainless steel pins and concealed ball bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.
   b. ~~Heavy-duty, extra-bearing units for doors over 3 foot, 5 inches in width.~~ Three hinges per leaf to 7 foot, 6 inch height. Add one hinge for each additional 24 inches in height, or any fraction thereof.
   c. ~~Heavy-duty, extra-bearing units for doors with panic hardware or fire exit devices.~~ Three hinges per leaf to 7 foot, 6 inch height. Add one hinge for each additional 24 inches in height, or any fraction thereof.
   d. Extra heavy weight hinges on doors over 3 foot, 5 inches in width.
   e. Extra heavy weight hinges on doors with panic hardware or fire exit devices.
   f. Extra heavy weight hinges on restroom, locker, gym, and other high frequency openings.
   g. Outswinging exterior doors: non-ferrous with non-removable (NRP) pins.

h. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.
i. Five inch tall hinge at openings over 36 inches in width.

6. Continuous hinges shall be Ives Geared Hinges as specified or equal products manufactured by Select Products and/or ABH.
   a. Continuous Hinges: Geared-type aluminum at exteriors.
   b. Heavy-duty, extra-bearing units for doors over 3 foot, 5 inches in width.
   c. Heavy-duty, extra-bearing units for doors with panic hardware or fire exit devices.

B. Standards: BHMA Certified products complying with the following:
   1. Butts and Hinges: BHMA A156.1.
   2. Continuous Geared Hinges: BHMA A156.26.
   3. Template Hinge Dimensions: BHMA A156.7.
   4. Self-Closing Hinges: BHMA A156.17.
   5. Floor Hinges: BHMA A156.4.

C. Quantity: Provide the following, unless otherwise indicated:
   1. Two Hinges: For doors with heights up to 60 inches.
   2. Three Hinges: For doors with heights 61 to 90 inches.
   3. Four Hinges: For doors with heights 86 to 95 inches.
   4. For doors with heights more than 96 add 1 hinge for every 23 1/15 inches of door height no greater than 120 inches.

D. Flush Floor Plates and Thresholds: Provide finish cover plates or thresholds as indicated in door hardware sets for floor hinges. Match door hardware finish, unless otherwise indicated.

E. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

		Metal Thickness (Inches)	
Maximum Door Size (Inches)	Hinge Height (Inches)	Standard Weight	Heavy Weight
12-in to 35 15/16-in x 120-in x 1-3/4	4-1/2	0.134	0.180
36 1/16-in x 83 to 120-in x 1-3/4	5	0.146	0.190

F. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
   1. Exterior Doors: Heavy weight, non-ferrous, ball bearing hinges.
   2. Interior Doors: Heavy weight, ball bearing hinges unless Hardware Sets indicate standard weight.

G. Hinge Height Clarifications: Where uneven door leafs occur, the widest door leaf should be used to determine the height of the hinges on the inactive and active door leafs; to ensure equal size hinges on opening.

H. Hinge Weight Clarification: If heavy weight hinges are specified in hardware sets for aluminum frames then standard weight hinges can be used. If aluminum frame openings are 42 inches and greater then an additional hinge should be used in lieu of heavy weight hinges.

I. Hinge Options: Comply with the following where indicated in the Door Hardware
Schedule or on Drawings:
   1. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:

a. Out-swinging exterior doors.
b. Out-swinging access controlled doors.
c. Out-swinging key lockable doors.

2. Electric Hinges: Provide electric transfer hinges with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Wire nut connections are not acceptable.

J. Provide mortar guard enclosure on frames at each electrical hinge location specified.

2.3 SCHEDULED DOOR HARDWARE/DOOR BOLTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Surface Bolts: Flush Bolts and Coordinators
1. Ives (IV).
2. Rockwood Manufacturing (RO).
3. Trimco Manufacturing (TR).

B. Standards: Comply with the following:
1. Surface Bolts: BHMA A156.16.
2. Automatic and Self-Latching Flush Bolts: BHMA A156.3.
3. Manual Flush Bolts: BHMA A156.16.

C. Surface Bolts and Flush Bolts: BHMA Certified Grade 1.

D. Provide bolts with top rod of sufficient length to allow bolt location approximately six feet from the floor regardless if detailed as such in hardware sets. Furnish dust proof strikes for bottom bolts. Surface bolts to be 8" in length, unless otherwise noted and U.L. listed for labeled fire doors.

E. Bolt Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
1. Mortise Flush Bolts: Minimum 3/4-inch throw.

2.4 LOCKS AND LATCHES

A. General - All the locksets, latch sets, and trim to be of one manufacturer as hereafter listed for continuity of design and consideration of warranty. Locksets specified are Falcon "T" series with the Dane lever or acceptable products manufactured by Schlage "ND" with the Rhodes lever (No Substitution).

Mechanical Locks shall meet ANSI Operational Grade 1, Series 4000 as specified.
1. Hand of lock is to be field reversible or non-handed.
2. All lever trim is to be through-bolted through the door.
3. Provide a ¾" (A98835-OSD) latch throw at all pairs of doors.
4. Provide a 3 ¾" back set at all doors specified with sound seal is STC Rated.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Mechanical Mortise Locks and Latches:
a. Falcon (FAL) MA Series w/ Dane Trim Preferred
b. Schlage (SC) – L9000 Series w/ 06A Trim
2. Mechanical Bored Locks and Latches:
a. Falcon (FAL) – "T" series, Preferred
~~b~~. Schlage (SC) – ND Series
3. Auxiliary Cylindrical Deadbolts:
a. Schlage (SC) – B600 Series
b. Falcon (FAL) D100 Series, Preferred

C. Standards: Comply with the following:
1. Mortise Locks and Latches: BHMA A156.13.

2. Bored Locks and Latches: BHMA A156.2.
3. Auxiliary Locks: BHMA A156.5.

D. Mortise Locks: BHMA Certified Grade 1, Series 1000.
E. Bored Locks: BHMA Certified Grade 1, Series 4000.
F. Interconnected Locks: BHMA Certified Grade 1.
G. Auxiliary Locks: BHMA Certified Grade 1.
H. Lock Trim: Match the following design style:
1. Levers:
a. Falcon Dane "DG"
b. Schlage (SC) – RHO

I. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:
1. Mortise Locks: BHMA A156.13
(Verify with SAISD if required on existing doors.)
2. Bored Locks: BHMA A156.2.
3. Interconnected Locks: BHMA A156.12.

Lock Function	Lock Type
T521	Entrance Lock or Offices
T381	**Classrooms**- Learning Center Function with double lock cylinder and core
T581	Storage Function
T101	Passage – **Single User Restrooms**
T301	Privacy

J ~~Backset: 2-3/4 inches unless otherwise indicated.~~ Provide all single use restroom with the Indicator Deadlock B571 x 6 Emergency Keys 61-510.

K. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
1. Mortise Locks: Minimum 3/4-inch latchbolt throw.
2. Bored Locks: Minimum 1/2-inch latchbolt throw.
3. Deadbolts: Minimum 1-inch bolt throw.

L. Backset: 2-3/4 inches unless otherwise indicated.
M. Provide metal wrought box strike boxes and curved lip strikes with proper lip length to protect trim of the frame, but not to project more than 1/8 inch beyond frame trim or the inactive leaf of a pair of doors.

2.5 ELECTRIFIED LOCKS
A. Manufacturers: Subject to same compliance standards and requirements as mechanical locksets, provide products by one of the following:
1. Electromechanical Mortise Locks:
a. Falcon (FAL) – T881 Series.
b. Schlage (SC) – ND80BDEU Series.
3. Electrified Options: As indicated in hardware sets, provide electrified lock options including: outside door trim control, latchbolt and lock/unlock status monitoring, and request-to-exit signaling. Unless otherwise indicated, provide electrified locksets standard as fail secure.

2.6 CYLINDERS AND KEYING
A. A letter of authorization under the letterhead of the End User must accompany purchases of any products which involve patented cylinders, keys and accessories. Manufacturers of patented security cylinders to allow the ability for both security and conventional cylinders to be used together under the same facility master or grandmaster key system. The End User is required to have the ability for on-site cylinder pinning and original key cutting.
B. Manufacturers: Subject to compliance with requirements, provide products by one of

the following:

1. Patented Cylinders:
   a. Schlage (SCH) – Everest Restricted (Exterior)
   b. Falcon (FAL) - C607 keyway as required by SAISD (Interior)
2. Keying Requirements:
   a. Keying: Lock core keying schedules should be as simple as possible and, to the maximum extent feasible, must fall under the SAISD great grand master for all SAISD locks. The assigned SAISD Project Manager shall coordinate with Safety Security and SAISD Police Department ~~A/E should~~ to confirm the keying plan for each school with campus administration. ~~the SAISD Lock Department and the principal.~~
   b. Key System: Existing small format cylinders with interchangeable core. For estimating purposes use factory GMK charge. Initiate and conduct meeting(s) with Owner to determine system structure and keybow styles.
   c. Construction Keying: Temporary cores and keys remain property of hardware supplier.
   d. Interchangeable Cores: 7-pin solid brass construction.
   e. Permanent Cores: Furnish factory-keyed.
   f. Match the existing keyway for the school district.
   g. Permanent Keys and Cores: Use secured shipment direct from point of origination to Owner.
   h. Biting List: Provide a key-biting schedule. Use secured shipment direct from point of origination to Owner upon completion.
   i. Key Cabinet: Provide a key cabinet. Confirm mounting location in a secure area.

C. ~~Standards: Comply with the following:~~
~~1. IC Core: BHMA A156.5.~~
~~2. Key Control System: BHMA A156.5.~~

Master Key Systems: Subject to compliance with requirements, provide products by one of the following:

1. Provide all Exterior locks and Exit devices requiring cylinders with Schlage Small Format Interchangeable Core Cylinder keyed to the Schlage Everest Restricted Master key System and comply with performance requirements of ANSI A156.5. Provide all Interior locks and Exit Devices requiring cylinders with Small Format Interchangeable Core (C607) Cylinder keyed to the Falcon Master key System and comply with performance requirements of ANSI A156.5.

2. All keys shall be of nickle silver material only. To the maximum extent feasible, all locks are to be factory keyed to the existing San Antonio Independent School District Master Key Systems (which are factory maintained as directed by San Antonio Independent School District (SAISD) and the Architect.

   Due to ongoing campus safety and security concerns, the assigned SAISD Project Manager will coordinate with approved door hardware installer and/or SAISD Safety & Security to ensure that the permanent cores will be District installed within an agreed upon time frame from substantial completion (no later 45 days from campus turnover).

—3. The hardware supplier shall meet with the General Contract, the Architect and - with SAISD authorized representative at the project site to determine all permanent keying requirements. The hardware supplier shall provide ~~two~~ Knox

Boxes as required by the local Fire Marshall at time of permit. The contractor shall, as required by the local Fire Marshall and San Antonio Independent School District mount the Knox Boxes in accordance with design specifications.

4. Furnish all exterior and interior locks, cylinders and Exit devices with temporary keyed construction cores for the duration of construction. Provide ten (10) construction keys and two (2) construction control keys total. The general contractor shall within thirty (30) days of the installation of permanent cores return all construction cores to the hardware supplier for full credit.

5. Cylinders shall be factory keyed and factor maintained as directed by San Antonio Independent School District (SAISD) assigned SAISD Project Manager in coordination with Safety Security personnel and the Architect.

   At a minimum, provide two (2) keys per cylinder and four (4) master keys per master used to be distributed as follows:
   1) Principal
   2) Campus Designated Agent for Key
   3) SAISD Safety & Security
   4) SAISD Police Department

   Additional requests for master keys shall be submitted to Safety Security personnel for distribution.

   Provide one hundred (100) exterior and interior key blanks for SAISD use as required. All permenant cores, keys and key blanks are to be delivered to the assigned SAISD Project Manager directly from the manufacturer. Provide a Factory generated bitting list for changes used and include additional bittings for future expansions as instructed during the project keying meeting. Signatures for all deliveries to SAISD by the General Contractor shall be required. Bitting list shall be provided in a digital format as to allow SAISD the ability to upload all bitting information into Site Master.

6. Stamp all keys "Do not duplicate" and with key symbol as directed by San Antonio Independent School District. Visual key control shall be provided on all permanent cores and keys.

D. Standards: Comply with the following:
   1. IC Core: BHMA A156.5.
   2. Key Control System: BHMA A156.5.

E. Cylinder Grade: BHMA Certified Grade 1.

F. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
   1. Interchangeable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.

G. Construction Keying: Comply with the following:
   1. Construction Master keying: Provide temporary construction master keyed cores that are replaceable by permanent cores.

H. Keying System: Unless otherwise indicated, provide for a keying system complying with the following requirements:
   1. New Grand Master Key System: Cylinders are factory keyed operated by a change key, master key, and a grand master key. Conduct keying meeting with End User to define and document keying system instructions and requirements.

H. Keys: Provide nickel-silver keys complying with the following:
   1. Stamping: Permanently inscribe each key with a visual key control number

and as directed by Owner.

2. Quantity: Supply as designated on SAISD key system set up per school level (ES, MS, HS).
   a. Extra Keyed Permanent Cores: Ten.
   b. Extra Blank Keys: Fifty.

I. Key Registration List: Provide keying transcript list to Owner's representative for lock cylinders.

J. Key Cabinets: TelKee, Lund, or Owners Standard.

2.7 STRIKES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Electric Strikes: BHMA Certified Grade
      a. Von Duprin 6000 series 630 (BHMA A156.5)

B. Standards: Comply with the following:
   1. Strikes for Bored Locks and Latches: BHMA A156.2.
   2. Strikes for Auxiliary Deadlocks: BHMA A156.5.

C. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
   1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
   2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
   3. Aluminum-Frame: Provide manufacturer's special strike box fabricated for aluminum framing.

D. Provide electrified products with an in-line power controller that enables the hardware to operate from 12 to 24 volts. On board safety features shall include an in-line fuse to protect the hardware and host system from any possible reverse current surges. The controller shall regulate current to provide continuous duty operation without the typical head build up. Adding the in-line power controller with electrified products provides unlimited lifetime warranty of electrified products.

2.8 EXIT DEVICES

A. All exit devices and trim, including electrified items, to be of one manufacturer as hereafter listed and in the hardware sets for continuity of design and consideration of warranty; electrified devices and trim to be the same series and design as mechanical devices and trim.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Exit Devices:
      a. Von Duprin (VO) – 35A/99 Series to match existing district standards.
   2. Exit Device Trim, Pull/Lever:
      a. Von Duprin (VO) – 990/996L
   3. Electrified Options: As indicated in hardware sets, provide electrified exit device options including: electric latch retraction, electric dogging, outside door trim control, exit alarm, delayed egress, latchbolt monitoring, lock/unlock status monitoring, touchbar monitoring and request-to-exit signaling. Unless otherwise indicated, provide electrified exit devices standard as fail secure.

C. Standard: BHMA A156.3.

D. Exit Devices: BHMA Certified Grade 1.
Exit Devices to be “UL” listed for life safety. All exit devices for labeled doors shall have “UL” label for “Fire Exit Hardware”. All devices mounted on labeled wood doors are to be through-bolted or per the manufacturer’s listing requirements. All devices shall

conform to NFPA 80 and NFPA 101 requirements.

E. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

F. Fire Exit Devices: Complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.

G. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

H. Outside Trim: Match design for locksets and latchsets, unless otherwise indicated.

I. Through Bolt Installation: For exit devices and trim as required for fire rated wood doors.

J. All exit devices to be of a heavy duty, chassis mounted design, with one-piece removable covers, eliminating necessity of removing the device from the door for standard maintenance and keying requirements.

K. All trims to be through-bolted to the lock stile case. Lever design to be the same as specified with the lock sets ("Dane" - lever design).

L. Exit Devices shall be the modern push rail design. All exit devices shall be mounted with sex bolts on wood and hollow metal doors.

M. All devices shall carry a three- (3) year warranty against manufacturing defects and workmanship. Exit devices shall be certified by an independent testing lab for a minimum of 1,000,000 cycles.

N. Furnish roller strikes for all rim and surface vertical rod exit devices. Internal springs shall be coil compression type. Furnish security dead latching for all active latch bolts. Latch bolts to have self lubricating coating to reduce friction and wear. Plated latch bolts not accepted.

O. Provide wiring harnesses & connectors on all Electrified Exit Device and Electric Strikes. All Electric Strikes used shall be Von Duprin 6000 CON series.

P. All removable mullions shall be the "KR" key removable with 154 stabilizers and MT54 Mullion Storage Kit.

Q. Exit Devices shall be Von Duprin "33A/99" series "No Substitution".

2.9 ACCESSORIES FOR PAIRS OF DOORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Coordinators:
      a. Ives (IV)
      b. Rockwood Manufacturing (RO).
      c. Trimco (TR)
   2. Keyed Removable Mullions:
      a. Von Duprin (VO) KR9454 154 MT54 Series.
      b. Von Duprin (VO) KR4954 154 MT54 Series.

B. Standards: Comply with the following:
   1. Coordinators: BHMA A156.3.
   2. Removable Mullions: BHMA A156.3.

C. Fire-Exit Removable Mullions: Provide keyed removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions shall be used only with exit devices for which they have been tested.

2.10 PUSH PLATES, DOOR PULLS, AND KICKPLATES

A. All push plates, door pull, kick plates and other miscellaneous hardware as listed in hardware sets. Equivalent products as manufactured by Ives, Hager, ABH and Trimco are acceptable.

B. Kick plates to be 10 inches high and Mop plates to be 6 inches high, both by 1-1/2

inches or 1 inch less than door width (LDW) as specified. They are to be of 16-gauge thick stainless steel. For door with louvers or narrow bottom rails, kick plate height to be 1 inch less dimension shown from the bottom of the door to the bottom of the louver or glass.

C. Where required armor plates, edge guards and other protective hardware shall be supplied in sizes as scheduled in the hardware sets.

D. Finish: Same as other hardware where available.

2.11 CLOSERS and POWER OPERATORS

A. All closers for this project shall be the products of a single manufacturer for continuity of design and consideration of warranty. All door closers shall be mounted as to achieve the maximum degree of opening (trim permitting).

B. All closers to be heavy duty, surface-mounted, fully hydraulic, rack and pinion action with high strength cast iron cylinder to provide control throughout the entire door opening cycle.

C. Size all closers in accordance with the manufacturer's recommendations at the factory.

D. All closers to have adjustable spring power sizes 1 or 2 through 4 or 6 and separate tamper resistant, brass, non-critical regulating screw valves for closing speed, latching speed and back-check control as a standard feature unless specified otherwise.

E. All closer covers to be rectangular, full cover type of non-ferrous, non-corrosive material painted to match closer. Provide closer covers only if provided as a standard part of the door closer package.

F. Closers shall have heavy-duty arms. All closer arms shall be of enough length to accommodate the reveal depth and to insure proper installation. The hardware supplier shall provide all required brackets, spacers or filler plates as required by the manufacture for a proper and functional installation as part of their base bid.

G. Supply appropriate arm assembly for each closer so that closer body and arm are mounted on non-public side of door opening and on the interior side of exterior openings, except where required otherwise in the hardware sets.

1. All parallel arm mounted closers to be factory indexed to insure proper installation.
2. Furnish heavy-duty cold forged parallel arms for all parallel arm mounted closers.
3. Surface Closers shall be submitted for approval based on the exact arm mounting (Heavy Duty Regular Arm or Heavy-Duty Parallel Arm) to insure the correct installation and adjustment.

H. Provide closers with special application and heavy-duty arms as specified in the hardware sets or as otherwise called for to insure a proper operating, long lasting opening. Drop plates and any additional brackets required for the proper installation of the door closer shall be included in the hardware supplier's base bid.

I. Finish: Baked on Powder Coated finish shall match other hardware.

J. Provide and install all door closers on hollow metal or Wood Doors with sex bolts as provided by the manufacturer. Aluminum Doors shall be installed with the Manufacturers standard machine screw.

K. Closers shall be LCN 4040XP (EDA, HEDA, SCUSH, SHCUSH Arms) series at all Exterior or Interior Sound Rated Doors and 1461FC (HD, HDPA, SCUSH, SHCUSH Arms) series at all Interior doors unless specified otherwise in the hardware sets (No Substitution).

L. Interior Automatic Operators shall be the LCN 4640/4630 or Tormax "TOR" series with Touchless Actuators, Mounting Boxes and Weather Ring Seals as required "No Substitution". Exterior Automatic Operators shall be the LCN 9500 series with Touchless Actuators, Mounting Boxes and Weather Ring Seals as required "No Substitution".

M. Manufacturers: Subject to compliance with requirements, provide products by one the following:
   1. Surface-Mounted Closers (Heavy Duty): BHMA Certified Grade 1.
      a. LCN Door Closers (LC) – 4040XP Series (To Match Existing District Standards)
   2. Closer Holder Release (Detector) Devices: BHMA Certified Grade 1.
      a. LCN Door Closers (LC) – 4040SE Series
   3. Power Assist Operators: BHMA Certified Grade 1.
      a. LCN Door Closers (LC) – 4640 Series.
      b. Tormax (TOR) –

N. Standards: Comply with the following:
   1. Closers: BHMA A156.4.
   2. Power Operators: BHMA A156.19. Power operators to comply with TAS 404.3.

O. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide non-handed, factory-sized closers adjustable to meet field conditions and requirements for opening force.

P. Closer Options: As indicated in hardware sets, provide door closer options including: delayed action, hold open arms, extra duty parallel arms, positive stop/hold open arms, compression stop/hold open arms, special mounting brackets, spacers and drop plates. Through bolt type mounting is required as indicated in the door hardware sets.

Q. Power assist operators as surface mounted, electric low energy type conforming to ANSI A156.19 requirements and capable of meeting ANSI A117.1 guidelines. Outputs and relays required to be on board in the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.
   1. Outputs and relays on board the operator allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.
   2. Electronic Controls to be microprocessor controlled unit shall control the operation and switching of the swing power operator. The electronic control provides low voltage power supply for all means of actuation. Electronic encoder to determine absolute open and close position.
   3. ***All electrified locks should be fail secure.***

2.11 OPERATING and PROTECTIVE TRIM UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Metal Protective Trim Units:
      a. Ives (IV).
      b. Rockwood Manufacturing (RO).
      c. Trimco (TR)

B. Standard: Comply with BHMA A156.6.

C. Materials: Fabricate protection plates from the following:
   1. Brass/Bronze and Stainless Steel: .050 inches thick, beveled four sides (B4E) with countersunk screw holes.

D. Push-Pull Design: 1" Round with 12" Centers. Provide 90 degree offset pulls at exterior openings.

E. Fasteners: Provide manufacturer's designated fastener type as indicated in door hardware sets.

F. Furnish protection plates sized 1 1/2 inches less than door width (LDW) on push side and 1 inch less door width on pull side by height specified in door hardware sets.

2.12 STOPS AND HOLDERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Stops and Holders:
      a. Ives (IV).
      b. ~~Rockwood Manufacturing (RO).~~ ABH
      c. Glynn Johnson.
      d. Trimco Manufacturing

B. Standards: Comply with the following:
   1. Stops and Bumpers: BHMA A156.16.
   2. Electromagnetic Door Holders: BHMA A156.15.
   3. Combination Overhead Holders and Stops: BHMA A156.8.
   4. Door Silencers: BHMA A156.16.

C. Stops and Bumpers: BHMA Certified Grade 1.

D. Electromagnetic Door Holders for Labeled Fire Door Assemblies: Coordinate with fire detectors and interface with fire alarm system. Magnetic door holders shall meet or exceed ANSI A156.15 and be UL listed 228 for Door Closer and Holders, with or without integral smoke detectors. Holding force shall be 25 to 40 pounds and shall be fail-safe. Pushpin release that eliminates residual magnetism shall be standard. Provide magnetic hold-opens with triple-voltage coil that can receive 12 VDC, 24 VAC/DC, or 120VAC; or coordinate required voltage with electrical. Subject to compliance with requirements, provide products by one of the following:
   1. LCN (LC) – SEM7800 Series.
   2. Rixson Hardware (RX) - 980 Series.
   3. Architectural Builders Hardware (ABH) - 2000 Series

E. Combination Overhead Stops and Holders: Certified BHMA Grade 1.
   1. Glynn-Johnson (GJ) – 100 Concealed and 90 Surface Series
   2. Architectural Builders Hardware (ABH) 1000 Concealed and 9000 Surface Series

F. Floor Stops: Stops are to be furnished for every door leaf. Every door is to have a floor, wall, or an overhead stop. Stops are to be furnished for every door leaf. Every door is to have a floor, wall, or an overhead stop.

   Place doorstops in such a position that they permit maximum door swing, but do not present a hazard of obstruction. Furnish floor strikes for floor holders of proper height to engage holders of doors.

   For doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic.
   1. Where floor or wall stops are not appropriate, provide overhead stops.

G. Door Silencers:
   Provide door silencers at all openings without gasket. Provide two- (2) each at each pair of doors and three- (3) or four- (4) each for each single door (coordinate with the frame manufacturer).

   Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch fabricated for drilled-in application to frame. Provide (3) per single door and (2) per paired door frame if applied gasketing is not specified in Hardware Sets.

H. Where overhead stops and holders are specified, or otherwise required for proper door operation, they are to be heavy duty and of stainless-steel base metal with no plastic parts as specified. The General Contractor shall provide wood blocking in all stud walls specified and scheduled to receive wall stops.

I. Finish: Same as other hardware where available.

J. Acceptable Products

1. Floor and wall stop as listed in hardware sets. Equivalent products as manufactured by Ives, ABH, Glynn Johnson and Trimco are acceptable.

2.13 DOOR THRESHOLDS, WEATHERSTRIPPING AND GASKETING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Door Thresholds, Weatherstripping and Gasket Seals:
      a. Zero (ZE).
      b. NGP Manufacturing (NG)
      c. Reese Manufacturing (RE)

B. Standard: Comply with BHMA A156.22.

C. General: Provide continuous weatherstrip seal on exterior doors and smoke, light, or sound gasketing on interior doors where specified. Provide non-corrosive fasteners for exterior applications.
   1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame. Install header seal before mounting door closer arms.
   2. Meeting Stile Astragals: Fasten to meeting stiles, forming seal when doors are closed.
   3. Door Sweep: Apply to bottom of door, forming seal with threshold when door is closed.

D. Basic Sound Seal Requirement: Whether indicated on the drawings or not, provide gasketing MCKS88BL at sound rated wall types and at the following areas for limiting of sound transmission: private offices, exams, conference, private toilets, corridor openings, rooms and similar sound sensitive area.

E. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are 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.
   1. Provide 8144S-BK-PSA smoke labeled perimeter gasketing at all smoke labeled openings.

F. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
   1. Intumescent Seals & Gasketing: Provide Zero 8144FS-BK surface, Category “B” type gasketing systems on assemblies where an intumescent seal is required to meet IBC and UL-10C positive pressure labeling. Category “A” type gasketing systems on assemblies where an intumescent seal is required to meet IBC and UL-10C positive pressure labeling as required by the Wood Door Manufacturer.

2.14 SLIDING DOOR HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. K. N. Crowder (KNC).
   2. Hager Manufacturing (HA).
   3. Richards-Wilcox, Inc. (RW).

B. Standard: Comply with BHMA A156.14.

C. Sliding Bi-Passing Pocket Door Hardware: Provide complete sets consisting of track, hangers, stops, bumpers, floor channel, guides, and accessories indicated.

D. Bi-folding Door Hardware: Rated for door panels weighing up to 200 lb. or higher.

E. Pocket Sliding Door Hardware: Rated for doors weighing up to 200 lb. or higher.

2.15 POWER SUPPLIES

A. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC

or 24VDC (field selectable) filtered and regulated power supplies. Modular unit in NEMA ICS 6, Type 4 enclosure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment. Third party listed and labeled for use with fire alarm systems. Power supply shall be furnished with a minimum of four (4) 4 Amp/hour batteries providing battery back up. An integral battery charging circuit shall be standard. Provide key locking cover to prevent tampering. Provide all control boards and relay panels to sufficiently operate the opening as described and intended per hardware sets. Subject to compliance with requirements, provide products by one of the following:

1. Boxed Power Supplies:
   a. Schlage Electronics (SCE) - 900 Series.
   b. Von Duprin (VO) – PS900 900-2RS Series.

2.16 WIRING HARNESSES & CONNECTORS

A. Furnish electric transfer wiring with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide an enough quantity of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and another one for hinge to junction box above the opening. Wire nut connections are not acceptable at low voltage electrified hardware. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified door.

2.17 KEYSWITCHES

A. Keyswitches shall be furnished on a stainless steel single gang face plate with a 12/24VDC bi-color LED and an integral backing bracket that shall permit integration with any 1.25” or 1.125” mortise cylinder. Keyswitches shall be available for momentary or maintained action and in narrow stile designs. Subject to compliance with requirements, provide products by one of the following:

1. Electric Wall Mount Keyswitches
   a. Schlage Electronics (SCE) – 650 Series
   b. Folger Adam (FO) – FAMK Series.

2.18 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.19 FINISHES

A. Standard: Comply with BHMA A156.18.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable and temporary protective covering before shipping to jobsite.

D. Finishes on locksets, latch sets and exit devices to incorporate an FDA recognized coating listed for use on medical and food preparation equipment that will suppress the growth and spread of a broad range of bacteria, algae, fungus, mold and mildew.

E. Provide clear powder coat finish at exit devices located on exterior openings such as gates and at pool exit doors.

F. BHMA Designations: Comply with base material and finish requirements indicated by the following:

1. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
2. BHMA 630: Satin stainless steel, over stainless-steel base metal.

G. Finishes for all hardware are as required in this specification and the hardware sets and Special care is to be taken to make uniform the finish of all various manufactured items.
1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Continuous Hinges: BHMA 630 (US32D)
3. Continuous Hinges: BHMA 628 (US28)
4. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D) Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D) Door Closers: Powder Coat to Match
6. Wall Stops: BHMA 630 (US32D)
7. Latch Protectors: BHMA 630 (US32D) Weatherstripping: Clear Anodized Aluminum Thresholds: Mill Finish Aluminum

2.20 KEY CABINET

A. Provide a key cabinet Lund 1200 series for installation by the contractor as instructed by the Architect and San Antonio Independent School District. Key Cabinet shall be of such size as to hold 150% of the total number of keys supplied for this project. Verify with San Antonio Independent School District Representative and the Architect if Key Cabinets are Required for each renovation project.

B. The hardware supplier shall provide San Antonio Independent School District two- (2) complete full-size copies of the floor plans complete with the door number and key symbol shown at each door opening. One- (1) copy shall be placed in the key cabinet and one- (1) copy shall be turned over to the San Antonio Independent School District Safety & Security.

EXECUTION

3.1 The architect should include the following requirements in their specification and include additional directives as necessary for the project.

3.2 ***The architect should coordinate with assigned SAISD Project Manager in coordination with the ~~Lock~~ Safety & Security department upon substantial completion a core installation and keying meeting. ~~Lock~~ Safety & Security department to participate in walk through and sign off on lock hardware and lock core install.***

3.3 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

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

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 PREPARATION

A. Steel Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

C. Electrified Openings: Provide steel doors and frames and wood doors prepared to receive electrified hardware connections specified in Door Hardware Sets without additional modification.

3.5 INSTALLATION

A. All finish hardware shall be installed by an experienced finish hardware installer with at least ten (10) years of documented experience after a pre-installation meeting between the contractor, hardware Manufacturer's representative, hardware supplier, hollow metal supplier, wood door supplier and Security Access Control Contractor. The finish hardware installer shall be responsible for the proper installation and function of all

doors and hardware.

B. The hardware supplier's office and stocking warehouse shall be located within a seventy-five (75) mile radius of the project site as to better service the general contractor and San Antonio Independent School District during this project construction phase.

C. Check hardware against the reviewed hardware schedule upon delivery. Store the hardware in a dry and secure location to protect against loss and damage.

D. Install finish hardware in accordance with approved hardware schedule and manufacturers' printed instructions. Pre-fit hardware before finish is applied to door; remove and reinstall after finish is complete and dry. Install and adjust hardware so that parts operate smoothly, close tightly, and do not rattle.

E. Mortise and cutting to be done neatly, and evidence of cutting to be concealed in the finished work. Protect all Finish hardware from scratching or other damage.

F. Provide two- (2) complete sets of special tools required for maintenance and adjustments of each piece of hardware supplied, including changing of cylinders.

G. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
   1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
   2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
   3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

H. Provide and coordinate concealed wood blocking for wall mount stops as detailed in Door Hardware Schedule.

I. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

3.6 FIELD QUALITY CONTROL

A. Field Inspection: Supplier and Door Hardware Manufacturer will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.
   1. Access Control System Consultant will inspect integrated electronic and access control hardware and state in report whether installed work complies with or deviates from requirements, including whether electronic and access control hardware is properly installed and performing according to system operational descriptions.
      a. Inspection: Verify that units and controls are properly installed, connected, and labeled and that interconnecting wires and terminals are identified.
      b. Pre-testing: Program and adjust the system and pretest all components, wiring, and functions to verify they conform to specified requirements. Replace malfunctioning or damaged items with new items.
      c. Acceptance Test Schedule: Schedule tests after pre-testing has been successfully completed and system has been in normal functional operation for at least 2 weeks.
      d. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

3.7 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. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:

1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

SECTION 08 80 00

GLAZED SYSTEMS

GENERAL

1.1 The architect should include in this section: exterior and interior glass, glazing sealant, aluminum framing systems, including storefront and curtainwall system, aluminum and glass entry doors, glazing of hollow metal doors, glazing of plastic laminate faced wood doors, aluminum horizontal sliding window, aluminum sunshades and operable windows.

1.2 The architect should use all applicable references, codes and National industry standards to specify and complete work performed in this division.

1.3 Require Engineer's calculations of performance requirements.

1.4 QUALITY ASSURANCE

A. Furnish a valid AAMA "Notice of Product Certification" indicating that the windows for the project conform to AAMA/NWWDA 101/I.S.2-97.

B. A manufacturer capable of providing aluminum framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.

C. Obtain aluminum framed storefront system from a single manufacturer.

1.5 Verify actual dimensions of aluminum framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1.6 Require a warranty for the work specified for two years against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials or workmanship such as distortion or waves.

PRODUCTS

2.1 Where products are named in the design guidelines, they are considered basis of design. Other approved manufacturers must have a minimum of five years experience manufacturing products meeting or exceeding the guidelines to be considered.

A. Sub-Contractors and Installers shall be certified from the manufacturer of the system being provided. Window and curtain wall systems shall be provided from manufacturer to the project site and shall not be assembled from raw extrusions or product material stock.

2.2 PERFORMANCE SPECIFICATIONS

A. Require the following simultaneously through the most adverse conditions of each exterior application.

1. Design system to withstand positive and negative windloads normal to the plane of the wall in excess of 20 psf.
2. Provide for noiseless expansion and contraction of all materials and assemblies due to temperature changes in a range between 10 degrees F and 180 degrees F without detriment to appearance or performance.
3. Drain water entering at joints and condensation occurring within the wall construction to the exterior face of the wall. Allow no uncontrolled water other than condensation on the interior face of the wall.
4. Limit air leakage to maximum 0.06 cfm per square foot of wall projected area.

(Storefront at 8 lb./sq.ft.)

B. Require the following simultaneously through the most adverse conditions of each exterior application. Aluminum Window Requirements Conformance to specifications in AAMA/NWWDA 101/I.S.2 when tests are performed on the prescribed 8'0" x 5'0" minimum test size with the following test results:
   1. Air Infiltration should be a maximum of .07 cfm/square foot when tested per ASTM E 283 at a static air pressure difference of 1.57 psf.
   2. There should be no uncontrolled water leakage when tested per ASTM E 547 and ASTM E 331 at a static air pressure difference of 10 psf
   3. The window should be operable with a maximum .4% permanent deformation per member when tested at a static air pressure difference of 67.5 psf.

2.3 MATERIALS

A. Aluminum
   1. Aluminum Alloys should comply with the standards and designations of the Aluminum Association and the following Standards: Sheet and Plate (ASTM B209), Extruded Bars, Rods, Shapes, and Tubes (ASTM B221), Bars, Rods, and
   Wire (ASTM B211), Standard Structural Shapes (ASTM B308), Drawn Seamless
   Tube (ASTM B210), Extruded Structural Pipe and Tubes (ASTM B429), and Welding Rods and Bare Electrodes (AWS Code).
   2. Aluminum Finish, as selected by SAISD Program Manager, should conform to AAMA 2604 for applied finishes or AAMA 661 for anodized finishes and have a five-stage; zinc chromate conversion coating pretreatment. The finish shall be applied with electrostatic spray and oven bake by approved applicator. The dry film thickness must be a minimum 1.2 mils on exposed surfaces, except inside corners and channels.

B. Steel:
   1. For Carbon Steel, provide structural reinforcement as required.
   2. Stainless Steel Fasteners should meet ASTM A167, type 302/304 and have a No. 4 satin finish where exposed.
   3. Require galvanized or stainless steel for shims. Galvanized steel shall meet (ASTM A36 or ASTM A283) and stainless steel shall meet (300 Series). Do not use aluminum or plastic shims.
   4. For Exposed Cladding, Trim and Panels, provide cladding elements with formed edge flanges and backside stiffener members as required to maintain such flatness that when measured at room temperature the maximum slope of the surface at any point, measured from the nominal plane of the surface in its final installed position shall not exceed 1.25 degrees.
   5. Materials used as permanent or temporary protection for metals shall conform with the following standards:
      a. Bituminous Paint: FS TT-C-494 or MIL-P-6883A.
      b. Mastic Bulk Compound: FS SS-C-153, Type I or Type II.
      c. Preformed Mastic Tape: NAAMM Specifications for Non-Shrinking, Non-Resilient Performed Sealing Compound
      d. Zinc Rich Paint: MIL-P-38 336.

C. Glazing Materials at Hollow Metal Frames:
   1. Use glazing compounds and preformed glazing sealants approved for the application, conforming to Glazing Materials portion of FGMA Glazing Manual.
   2. Sealant should be one part acrylic polymer sealant conforming to FS TT-S-00230 or silicone, FS TT-S-0023-C. Use for glazing of all fixed glass. Include primer as recommended by manufacturer. All sealants shall be compatible

with adjacent material per manufacturer's instruction.

3. Setting Blocks should be hard rubber or clean grain softwood.
4. Back-up material should be foamed polyethylene or polystyrene rodstock, sizes as required by joint condition, and compatible with sealant.
5. Glazing Tape should be DAP #1202 or as approved.
6. Glazing Gaskets are extruded neoprene, free of porosity, surface defects, dimensional irregularities and conforming to physical properties of ASTM C509.
7. Use of metal sash putty will not be permitted, but compound conforming to FS T-G-410 will be permitted. The use of nonskinning compounds, nonresilient type preformed sealers, and preformed impregnated type gasket will not be permitted.

D. Glazing Materials at Aluminum Framing include extruded neoprene glazing gaskets and sealant complying with Federal Spec. TT-S-00230.

1. Glass: Glass shall meet the requirements of ASTM C1036.
2. Care shall be taken to minimize the tong marks and, unless indicated otherwise, the tong marks shall occur at the bottom of the glass (after installation).
3. All glass shall be heat strengthened unless noted otherwise.
4. Color of tinted glass shall be as selected by SAISD Program Manager
5. ***Safety Glazing*** is subject to compliance with requirements, obtain safety glazing products permanently marked on each individual glass lite with certification label of manufacturer acceptable to authorities having jurisdiction. Safety glazing shall conform to ANSI Z97.1, Safety Performance Specification, and ANSI Z97.1, Safety Glass Code., and IBC 2406.1 as applicable.
6. ***Bullet resistant glass***, where specified, is subject to compliance with requirements with authorities having jurisdiction. The glass shall be 1-3/16 inch thick, Class I for use with and supplied loose by window manufacturer.
7. **No IG unit shall be larger than 48" x 48" and laminated or tempered glass should not be larger than 48" x 72". All other sizes will need to be approved by assigned SAISD Project Manager in coordination with and SAISD Facility Services ~~Maintenance~~ Department.**
8. **All glazing shall be center set inside glazed.**
9. All exterior glazing shall be 1" insulated glazing systems.
10. Interior glazing shall meet code, i.e. tempered or wire/fire.
11. Exterior Glass shall be 1 inch thick insulating glass units comprised of a 1/4 inch thick glazing quality Low-e tinted tempered float glass exterior lite with a 1/4 inch thick glazing quality clear tempered float glass interior lite, separated by a ½ inch air space. ***District preference is Solarban® 60 "Solargray" manufactured by PPG Industries, other selections may be submitted to the SAISD Program Manager for review.*** Glass shall have the following properties:
    1) Visible Light Transmittance (%): 35
    2) Winter Night-time U-value: .29
    3) Shading Coefficient: 0.28
    4) Solar Heat Gain Coefficient (SHGC): 0.24
12. Acoustical Glass consisting of one lite of 1/4 inch thick tempered glass and one lite of 3/8 inch thick laminated clear float glass comprised of two 3/16 inch thick glazing quality clear float glass lites, laminated to each side of a clear 0.030 inch thick polyvinyl butyral (PVB) interlayer. Install in sound retardant doors.
13. ***NO LEXAN***

E. Aluminum and Glass Entrance Doors shall be Wide Stile Swing Door Standard Entrance or equivalent product from list of approved manufacturers.

1. Doors shall be 1-23/32 inch thick, consisting of 5 inch vertical stile, 5 inch top rail and 6-1/2 inch bottom rail aluminum tubular sections with 0.125 inch thick nominal wall thickness.
2. Provide bolted and welded connections, fit to a hairline joint. Provide reinforcing at bolted attachments. Tapped aluminum is not permitted. Require concealed screws, nuts, bolts, and anchors, except hardware screws on butt of door, of non-corrosive metal.
3. Require same glass type at all exterior locations. Deliver doors to job pre-glazed.
4. Use manufacturer's recommended glazing gaskets for flush glazing (color: Black).
5. Provide mullion stabilizer as required at double acting doors with removable mullion.

F. Aluminum Storefront/Entrance Framing System shall be 2 inch by 4-1/2 inch flush glazed type (typical) with mullion reinforcement, if necessary, to achieve structural requirements. Glass Pockets shall be sized to accept specified glass. Provide sill receptors with end dams (At all sill conditions). One operable window per classroom: project out hopper in storefront system.

G. Aluminum Curtain Wall System:
1. Structural Properties:
   a. Limit the dead load deflection of horizontal members supporting glass to 1/175 of the clear span with a 1/8 inch maximum deflection.
   b. Limit the deflection of any member in a direction parallel to the plane of the wall and of any corner mullion in both parallel and perpendicular directions to a maximum of 25 percent of the glass bite dimension and maintain a minimum of 1/8 inch clearance between the member and the edge of the glass, panel, or other component.
   c. Limit the wind load deflection of any member to 1/240 plus 1/4 inch of the clear span, based on “pinned” ends.
   d. Limit the wind load deflection of corner mullions to the span as specified above, with the specified pressure acting on one face of the building with no pressure acting on the adjacent face, or 1/2 the specified pressure acting on one face of the building with 1/2 the specified suction acting on the adjacent face, whichever is the greatest.
   e. No wall element shall sustain permanent deflection of glass breakage under maximum design load.
   f. The panels and their connections shall accommodate movements of the structure resulting from lateral forces. Provide connections with sufficient ductility to preclude brittle failure, at or near, welds.
   g. Framing Sizes: 2-1/2 inches x 6-3/4 inches **(OR 7-1/2 for required windloads or impact resistant)** where indicated on the drawings. Miter ends of horizontals to form segmented curve at commons.

EXECUTION

3.1 The architect should include the following requirements in their specification and include additional directives as necessary for the project.

A. Obtain hardware templates from finish hardware supplier.

B. Inspect each piece of glass immediately prior to start of installation. Do not install items which are improperly sized, have damaged edges, or are scratched, abraded, or damaged in any other manner. Do not remove labels from glass.
1. Install glass so distortion waves, if present, run in the horizontal direction.

C. Locate setting blocks at sills one quarter of the width of the glass in from each end of the glass, unless otherwise recommended by the glass manufacturer.

D. Install all glass, gasket, aluminum framing, aluminum horizontal sliding window in accordance with manufacturer's printed instructions. Installed windows units

shall conform to AAMA 502 minimum requirements for air and water infiltration.

In accordance with manufacturer's recommendation, metal window framing may require thermal breaks to assist in the mitigation against heat gain as well as condensation during cold weather. Excessive condensation can affect durability of existing drywall, paint, and other building materials to potentially adversely affect building indoor air quality.

E. Caulk joints where indicated to meet performance specifications

F. Erection Tolerances:
   1. Maximum deviation from vertical is 1/8 inch in any story and 1/4 inch in any 45 foot run.
   2. Maximum deviation from horizontal is 1/8 inch in any 30 foot run.
   3. Maximum deviation from true alignment is 1/32 inch for any two abutting units. Allow no edge projections.
   4. Maximum joint gap is 1/32 inch.
   5. Maximum openings between movable glazing stop and adjacent member is 1/32 inch.

G. Protect glass from breakage after installation by promptly installing streamers or ribbons, suitably attached to the framing and held free from glass. Do not apply warning markings, streamers, ribbons, or other items directly to the glass.

H. Adjust windows as necessary for smooth and weather tight operation, and leave windows clean and free of construction debris.

END OF SECTION

SECTION 28 05 00

ELECTRONIC SAFETY AND SECURITY COMMON WORK RESULTS

GENERAL

1.1 SECURITY SYSTEM DESIGN REQUIREMENTS:

A. Security drawings to be on separate plans from any other building systems.

B. 100% Design Development Milestone Requirements:

1. Locate all room locations that will house security panels and headend equipment.
2. At designated Design Development review meetings, information (through District project management software), and coordination with SAISD Police Department and Safety/Security shall include floor plans detailing system information, equipment locations and headend closet layouts. ~~SAISD Alarm Communications shall receive pdf versions of floor plans detailing system information, equipment locations and headend closet layouts.~~

C. 50% Construction Document Milestone Requirements:

1. Locate all security device locations, door contacts, motion detectors, security cameras with lens information.
2. Locations of all security keypads, control panels, expansion modules and power supplies. Include mounting heights of all devices.
3. Specifications detailing manufacturers and product numbers of devices to be installed.
4. At designated Construction Document review meetings, information (through District project management software), and coordination with SAISD Police Department and Safety/Security shall include floor plans detailing system information, equipment locations and headend closet layouts

~~4. SAISD Alarm Communications shall receive pdf versions of floor plans detailing system information, equipment model numbers, equipment locations and headend closet layouts.~~

D. 100% Construction Document Milestone Requirements:

1. All device and equipment locations as listed in previous design submissions above.
2. Detailed risers and equipment room layouts for all security equipment to be installed.
3. Complete and detailed specifications indicating product information and installation requirements.
4. Information (through District project management software), and coordination with SAISD Police Department and Safety/Security shall include floor plans detailing system information, equipment locations and headend closet layouts.

~~4. SAISD Alarm Communications shall receive pdf versions of floor plans detailing system information, equipment model numbers, equipment locations and headend closet layouts.~~

1.2 SYSTEM DESIGN

A. System design shall be based on two primary considerations: function and application. Both will vary depending on building structure and campus concern. Despite the inevitable variance, basic requirements shall be followed to ensure District wide compliance.

B. The following functional requirements shall be identified prior to the design of any security system to be installed on Campus:

1. Number and location of accessible perimeter doors and windows.
2. Number and location of entrances/exits (daytime and after hours).

3. Number and location of disabled access points.
4. Number and location of vulnerable interior spaces.
5. Number and location of keypad devices.
6. Number and location of special partitions (ROTC, Kitchens, MDF rooms, Athletic areas, Early Childhood Facilities, Music Facility, Cate Bldg., Stem Labs etc.).
7. Building hours of operation.
8. System monitoring.

C. The following requirements shall be included in the design of any security system on campus:

1. Controlled Doors
   a. Depending on building requirements, selected doors will be designated as controlled doors to be electrically locked/ unlocked ~~by VIS~~ by Campus Administration. (Main entry, ADA entry, and Man trap)
2. Card Reader Doors
   a. Exterior doors, especially those adjacent to parking lots, MDF room, IDF rooms, electrical rooms, mechanical rooms, admin office entry, and Kitchen entries shall be provided with card access control. Additional doors may be designated as card reader doors depending on the building size, functionality and anticipated or actual pedestrian traffic into and through the building.
3. Intrusion Detection Devices
   a. Ground floor areas or areas within a building that are considered to be "Reasonably accessible" from the building exterior shall include the installation of a detection device. Example: second floor window accessible by ladder or ledge.
   b. Hallways and stairwells on all levels shall include the installation of a detection device
   c. All devices shall be labeled with zone numbers.
4. Keypads
   a. System keypads shall be provided for all partitions ie. Main entry, kitchen entry, MDF room, early childhood facility, gyms, dance studio, drama, ROTC, and other commonly designated partitions.
5. Monitoring
   a. ~~System monitoring shall be provided via voice grade phone service or campus LAN~~. System monitoring shall be provided via campus LAN for Bosch panels.
6. Video Intercom Entries
   a. Perimeter door designated for parent and visitor entry shall contain a video intercom station with door releasable from receptionist desk
   b. Wheelchair accessible perimeter door shall contain a video intercom station with door releasable from receptionist desk
7. Security Backbone
   a. Security backbone shall consist of four 18 AWG 4 conductor direct burial cables from MDF room to each IDF, and concealed in a 12” x 12” metal can.
8. Intrusion Data Gathering Panel
   ~~DGP installed shall be either Honeywell Vista 128BPT or Bosch 9512G , and be determined by S.A.I.S.D. Police department during design phase.~~
   DGP installed shall be Bosch 9512G or approved equal.

1.3 SECURITY CONTRACTOR REQUIREMENTS:

A. Intrusion Detection System Contractor Requirements
   1. Responsible for complete installation of all security devices, wiring and commissioning of security systems.
   2. Provide all programming information of security systems and devices.

3. Provide training for all systems installed.

B. Video Surveillance System (VSS) Equipment Furnished by General Contractor – Verkada System or approved equal;

Verkada system is a cloud based networked base system with none of the previous ancillary equipment required (i.e., monitors, DVR, KVM, UPS, patch cables, et al). Refer to Video Surveillance System Standards for more information. Monitor not required with Verkada system

C. Security Camera Equipment Furnished and Installed by Contractor

D. Security contractor qualifications:
1. Minimum of five years of experience in the security industry under the current proposer's name.
2. Certified by the manufacturer of all the components they are installing.
3. The submitting contractor must be certified to install products and services for the system they are proposing. No subcontract of services will be allowed for any security scope of work.
4. Provide 24-hour support, 7 days a week within 2 hours during normal business days and 4 hours during non-business work hours.
5. Licensed in the state of Texas.
6. Provide a reference for at least three other projects similar in size to current work scope.

1.4 SECURITY INSTALLATION REQUIREMENTS:

~~A. Cabling Installation~~
~~1. Support wiring every 5'-0" on center, in 4" bridle rings, with no more than 12" cable sag between supports and without over tension of cables.~~
~~2. Label cabling with machine labels 18" of each end of cable keyed to the door, room, or corridor number.~~
~~3. Group cabling according to signal or power levels.~~
~~4. At headend rack, group power cables on one side of rack and coax cables on opposite side of rack.~~
~~5. Provide service loops at all cables and use Velcro tie wraps at all closet locations. Provide tie wraps at 4' intervals maximum and dress in neat orderly fashion.~~
~~6. Do not run cables above red iron joist.~~
~~7. No splices in any cables less than 500' in length.~~
~~8. All exterior exposed coaxial cable shall be contained in waterproof flexible conduit with appropriate fittings.~~
~~9. Provide waterproofing and fireproofing of all sleeves and openings as required.~~

A. Cabling Installation
1. Refer to section 7.6 section F "IP Camera Outlet" of the SAISD Cabling Standards for cabling details.

B. The security contractor is responsible for coordinating with the project electrical contractor on all power and raceway requirements for the project.
   1. Install 3/4" conduit with bushings for all exterior penetrations from device to nearest available above ceiling location.

C. ***All corridor doors leading to the building's exterior provide motion sensors and door contacts.*** *(refer to Video Surveillance System Standards)*

D. To the maximum extent feasible, all exterior security cameras to be mounted to the building. If exterior pole mounted security cameras provided, then ***a clear unobstructed space for maintaining and servicing the devices. No pole shall be above 12'-0".***

E. Contractor to contact assigned SAISD Project Manager who will coordinate with SAISD Life Safety Team for programming document requirements. ~~*SAISD Life Safety team for programming document requirements.*~~

TABLE OF CONTENTS

CSI MasterFormat

EXECUTION

3.1 RACEWAY AND POWER

A. Provide a complete raceway system and electrical branch circuits to serve all security system equipment. *(refer to Technology Standards for more information)*

B. Connect all security equipment to UPS (uninterruptable power supply) emergency backup.

END OF SECTION

SECTION 28 10 00

ELECTRONIC ACCESS CONTROL

GENERAL

1.1 WORK INCLUDED

A. The San Antonio Independent School District Physical Electronic Security System Standard is a guideline for physical security systems and the associated spaces to be applied by the design team for new or renovated facilities. Information herein is applicable to the Physical Security Consultant, IT Consultant, Architect, MEP, and contractors, and shall be taken into account for each project by all team members. The guidelines herein have been created to clarify design and installation process of electronic security systems on SAISD property.

1. The standard sets forth parameters for the technical system in addition to the site and building requirements to facilitate a properly-installed standards-compliant physical security system, organized as follows;
2. Physical Security Concepts, Assessment Recommendations, Industry Standards,
3. System Design Standards; Physical Security System Equipment, Rough-in and Conduit, Cabling, Grounding, Labeling, Testing, and As- Built Documentation.
4. Physical Security System Diagrams

B. The Contractor shall furnish and install a complete microprocessor based security alarm system as specified herein. The system shall include, but not be limited to, all control equipment, power supplies, power circuits, signal initiating and signaling devices, conduit, wire, fittings, and all other accessories required to provide a complete and operable system.

C. Security system devices indicated are for reference and coordination purposes only. The installing contractor shall design and provide a complete system, meeting the requirement of specification. The Contractor shall provide all security system devices required for complete system perimeter coverage acceptable to all governing authorities, Architect and Owner.

D. The system shall include security for all access into the building, including but not limited to entry doors, MDF entries, Kitchen Entries, and annex buildings. Perimeter doors shall have door contacts. Card reader access interface must also be provided at locations noted.

1. The Control System shall be Vanderbilt SMS or approved equal, as authorized by assigned SAISD Project Manager in coordination with the Life Safety Administration Team and in accordance with approved project substitution procedures. ~~approved by Life Safety Admin team~~ ~~No Substitute.~~
2. All cables shall be clearly marked/labeled at each end and identified clearly on as- built drawings.
3. Installation of control panels.
4. Interconnection of sub-control panels.
5. Installation of new security devices.
6. ~~Full coverage of all windows, doors, roof hatches, hallways, and stairwells.~~
6. Preconstruction meeting with Owner's personnel, installing technician and project superintendent.

E. All pathways expressly installed for Communications (Data and Telephone) will only be used for other types of cable with the permission of San Antonio Independent School District Information Technology.

1.2 Contractor Qualifications:

A. The installing contractor shall be the authorized representatives of ~~Bosch 9512G or approved equal.~~ Vanderbilt SMS or approved equal.

B. Manufacturer to sell, install, and service ~~Bosch 9512G or approved equal.~~ Vanderbilt SMS or approved equal. The installing contractor shall have represented the security alarm and access control system manufacturer's product for at least two years.

C. The installation contractor shall have personnel on their staff that have been actively engaged in the business of designing, selling, installing and servicing security alarm systems for at least ten years.

D. All Contractors must submit to the owner prior to starting any work the factory training certificates for all personnel that will be working on ~~Bosch 9512G or approved equal.~~ Vanderbilt or approved equal. No person is allowed to work on the system without proper manufacturer's certification.

PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS AND INSTALLERS

A. For any product numbers or manufacturers listed have been discontinued and are no longer available, Contractor shall submit a list of substitute equipment\parts to assigned SAISD Project Manager in coordination with the SAISD Police Department and in accordance with approved project substitution procedures ~~SAISD Police Department for written approval~~, prior to installation.

Where specific product manufacturers and models are mentioned, an equal equivalent will be considered following an official submission of product literature ~~and written acceptance by the San Antonio Independent School District Police Department~~. as authorized by assigned SAISD Project Manager in coordination with the SAISD Police Department and in accordance with approved project substitution procedures.

B. Equipment

1. Access Control System shall be manufactured by ~~Vanderbilt / Open Options~~ Vanderbilt or approved equal, ~~no exceptions~~.
2. Security contractor must be licensed security contractor and authorized representative of ~~Vanderbilt / Open Options~~ Vanderbilt (or approved equal) and submit copy of current license in submittals.
3. Contractor submitting and installing the work shall be the authorized ~~Vanderbilt / Open Options~~ Vanderbilt, no subcontracting this scope of work.
4. Install main access control panel in MDF room. Secondary panels may be installed in IDF room if the floor plan layout is too large to support the system from one location.
5. Use only ~~VRCNX-M controller~~ Vanderbilt Mercury (or approved equal) based 16 door controllers. The owner already has licenses for panels.
6. Access control contractor will contact assigned SAISD Project Manager who will coordinate with SAISD Life Safety Team for programming sheets and contractor will provide drawing with device locations, within SAISD Alarm Communication standards.
7. All programming will be completed per campus graphic number package.
8. All card readers shall be model MT11/MT15 Allegion Readers, no exceptions.
9. Each door setup should contain one door contact, one reader, one door strike, one request to exit switch in panic bar, and one junction box with terminal strip at the door.
10. Use a composite cable from panel to junction box.
11. Use an external power supply at head end, do not use internal power supply on main board for strike power or request to exit motion.

12. Magnetic locks are not to be installed in SAISD unless pre-approved by SAISD Police Department.
13. Power supplies shall be ~~Altronix, model #AL1024ULACMCV~~ shall be Life Safety to power door strikes and request to exit motion devices.
14. At power source for control panel ~~contractor to provide Mier #BW210, beige in color, instrument box over receptacle~~ all connections shall be placed in an enclosure.
~~15.~~ ~~Motion to exit devices shall be Bosch, #RTE model #DS160 motion request.~~
15. Door strikes at exit doors shall be Von Duprin. If electric panic bars are needed, install Von Duprin QEL~~.~~ Do not use high current electric panic bars which require a power supply at the door location unless pre-approved by SAISD Alarm Communications. No Exceptions.
16. Contractor is required to setup and attend a pre-installation meeting between installing contractor and SAISD Police Department. Meeting must be held prior to any wiring or installation of security equipment has been started.
17. Card readers are recommended to be installed at the following locations:
    a. Elementary Campus:
        a) Main front door entry. Note – additional vestibule doors may be required to receive card access to secure admin area depending on layout.
        b) Kitchen back door
        c) Entrance from faculty parking lot
        d) Entrance from playground area
        e) MDF headend technology room, and IDF rooms
        f) Exterior entrance to main mechanical room in central plant
        g) Plant operator entrance
        h) Entrance from site temporary buildings
        i) Entrance from annex buildings
    b. Middle School Campus:
        a) All locations listed for Elementary Campus
        b) Entrance from athletic fields
        c) Entrance to main athletics area
    c. High School Campus:
        a) All locations listed for Elementary and Middle School Campus
        b) Entrance to Visual Arts Learning Center area
        c) Entrances to and from main building adjacent entrances to Fine Arts, Music, CATE, and external gyms and field houses
18. Card readers shall be placed on the right side of the door as you enter door from the outside unless placement cannot be made. For all pairs of doors, the right hand door as you face from the outside shall be the door tied to access control system.
19. All final walkthroughs of complete installation and delivery of spare or accessory products must be scheduled and signed off by SAISD Alarm Communications. All final delivery of products must have a sign off receipt from contractor to SAISD Alarm Communications and signed receipt of delivery included in close out documents.
20. Provide Aiphone, IX Series remote door release system per campus. Provide and install IX MV7's at Reception Desk, Principal Secretary Desk and Principal Desk. Install Aiphone IX DV door call station at front entry and faculty entrance location. Aiphone interface to act as card reader interface for selected door. Mounting height shall be 5 feet.
21. Provide battery backup on control panels and power supplies.
22. All doors shall be installed and configured for "fail secure" operation.

EXECUTION

3.1 INSTALLATION

A. All wire shall be UL Listed CL2 for limited energy (300V) applications and shall be installed in conduit. Limited energy MPP wire may be run open in return air ceiling plenums provided such wire is UL Listed for such applications and is of the low smoke producing fluorocarbon type and complies with NEC Article 760 if so approved by the local authority having jurisdiction.

B. No branch circuit or 120V power wiring or any other wiring shall be run in the same conduit as security alarm wiring.

C. All wire shall be installed in an approved conduit /raceway system (except where permitted by NEC and the local authority having jurisdiction). Maximum conduit "fill" shall not exceed 40% per NEC.

3.2 TESTING

A. Submit a written test report from an authorized representative of the equipment manufacturer that the system has been 100% tested and approved. Final test shall be witnessed by Owner, Engineer, Electrical Contractor and performed by the equipment supplier. Final test report must be received and acknowledged by the Owner prior to substantial completion.

B. Provide instructions as to proper use and operation of the system, for the Owner's designated personnel.

3.3 SOFTWARE

A. Provide two electronic copies of the final programming and program software to the Owner's Life Safety System Administrators after final approval.

END OF SECTION

SECTION 28 13 00

INTRUSION DETECTION SYSTEM

GENERAL

1.1 WORK INCLUDED- Intrusion Detection System

A. The Contractor shall furnish and install a complete microprocessor based security alarm system as specified herein. The system shall include, but not be limited to, all control equipment, power supplies, power circuits, signal initiating and signaling devices, conduit, wire, fittings, and all other accessories required to provide a complete and operable system.

B. Security system devices indicated are for reference and coordination purposes only. The installing contractor shall design and provide a complete system, meeting the requirement of specification. The Contractor shall provide all security system devices required for complete system perimeter coverage acceptable to all governing authorities, Architect and Owner.

C. The system shall include security for all access into the building, including but not limited to doors, roof hatches, windows and interior space motion detection.

1. The Control System shall be Bosch 9512G or approved equal. No Substitute.
2. All cables shall be clearly marked/labeled at each end and identified clearly on as- built drawings.
3. Installation of security panels.
4. Interconnection of security panels.
5. Installation of new security devices.
6. Full coverage of all windows, doors, roof hatches, hallways, and stairwells.
7. Preconstruction meeting with Owner's personnel, installing technician and project superintendent.

1.2 Contractor Qualifications:

A. The installing contractor shall be the authorized representatives of Bosch 9512G or approved equal.

B. Manufacturer to sell, install, and service Bosch 9512G or approved equal. The installing contractor shall have represented the security alarm and Access control system manufacturer's product for at least two years.

C. The installing contractor shall provide 24 hour, 365 day per year emergency service with factory trained service technicians.

D. The installing contractor shall have personnel on their staff that has been actively engaged in the business of designing, selling, installing, and servicing security alarm systems for at least ten years.

E. All Contractors must submit to the owner prior to starting any work the factory training certificates for all personnel that will be working on the Bosch 9512G or approved equal. No person is allowed to work on the system without proper manufacturer's certification.

PRODUCTS

2.1 INTRUSION DETECTION SYSTEMS

A. For any product numbers or manufacturers listed that have been discontinued and are no longer available, Contractor shall submit a list of substitute equipment and\or parts to SAISD Police Department for written approval, prior to installation.

B. System Monitoring and Performance

1. SAISD will monitor all panels 24/7 via internet network connections in panels. Secondary monitoring will be provided by SAISD via radio system and cellular communications ~~internal radio system and telephone communications~~ as backup monitoring and notification. All panels and termination points of system

will be in MDF and IDF rooms along with maintenance rooms as indicated on drawings.

C. Intrusion Detection System Equipment Door contacts
1. Provide at all roof scuttles, floor hatches, kitchen doors, exterior roll-up doors, and all Perimeter doors. Provide door contacts on exterior mechanical room and/or electrical room doors that only have outside exterior access.
2. All door contacts shall be recessed in door frame whenever possible and shall match color of door frame.
3. Install Sentrol model #1078-CM or equivalent for recessed applications.
4. Steel door contacts should be Sentrol #UTC2505AL
5. All doors shall be addressed separately. Double doors to be wired in series and identified as single zone.
6. Provide surface mounted raceway for any exposed security wiring required to connect device.
7. Wiring shall be 18 gauge, two conductor, unshielded stranded cable, white in color, plenum rated.
8. Do not exceed 500' from device to intrusion alarm expansion module or alarm control panel. Locate expansion modules in IDF rooms.

D. Motion Detectors
1. Bosch Motion Detector (or approved equal) shall be installed within administration offices, first floor spaces with windows, ROTC room, all locker rooms, auditoriums, Visual Arts Learning Center and performing arts rooms, science learning center/wet labs and automotive and machine shops, computer labs, Perimeter Entries, MDF rooms, Stairwells and vocational/specialty learning centers.
2. Wall mounted on swivel base.
3. Provide surface mounted raceway for any exposed security wiring required to connect device.
4. ~~Corner / wall mount motion detector use Bosch Sensors. For long hallways, use Bosch Long Range~~
   For rooms use Bosch 360 Sensors or approved equal. For entryways use corner mounted Bosch 40 foot motion sensors. For long hallways, use wall mounted Bosch Long Range Motion Sensors. Long range sensors must be mounted in a fashion that will affectively monitor the full range of the sensor.
5. ***A motion sensor should be added at all entrances that lead to hall corridors.***

E. Keypads
1. Install in administration office area, plant operator's office, main staff entrance boys/girls Gyms, and field houses, instrumental learning center/vocal music learning center rooms, ROTC, MDF Rooms, Kitchens, Dance Studios, CATE Building, and Annex Buildings.
2. Install Bosch B930 provided with clear Plexiglass vandal proof housing, Stopper #STI-6560 or pre approved equal. Provide clear space in front of keypad for accessibility.
3. Wiring shall be 18 gauge, four conductor, stranded cable, white in color, plenum rated. West Penn, General or Coleman are acceptable cable products.
4. Do not exceed 500' from device to intrusion alarm expansion module or alarm control panel.

F. Equipment

1. Battery shall be a minimum 12volt 7 AH.
   a. Alphanumeric characters will identify alarm zones. "R" for room, "D" for door and "C" for corridor followed by a dash and the designated alphanumeric character of the building area, followed by the number. (ex: C-by-room 124 is a corridor in building section B and its corridor #124 or simply "Corridor B124".
   ~~b. Provide Zone List to District for programming~~
   b. Provide drawing with devices locations and zone numbers, and provide Zone List to assigned SAISD Project Manager to coordinate with SAISD Life Safety Team. ~~Contact SAISD Life Safety Team~~ for programming documents.
2. ~~Power supplies shall be Altronix AL600ULACMCB.~~
   Power supplies shall be Bosch SDI2 Power supplies. A wall mounted UPS shall also be installed at main alarm panel,
3. Install Two 18 Gauge 4 conductor cables for backbone wiring between panels.
4. All final walk thru's of complete installation and delivery of spare or accessory products must be scheduled and signed off by SAISD Police Department. All final delivery of products must have a sign off receipt from contractor to SAISD Police Department and signed receipt of delivery included in close out documents.
5. Install battery backup for control panel and power supplies.
6. No glass break detection shall be corner wall mounted (no exceptions).

EXECUTION

3.1 INSTALLATION

A. All wire shall be UL Listed CL2 for limited energy (300V) applications and shall be installed in conduit. Limited energy MPP wire may be run open in return air ceiling plenums provided such wire is UL Listed for such applications and is of the low smoke producing fluorocarbon type and complies with NEC Article 760 if so approved by the local authority having jurisdiction.

B. No branch circuit or 120V power wiring or any other wiring shall be run in the same conduit as security alarm wiring.

C. All wire shall be installed in an approved conduit/raceway system (except where permitted by NEC and the local authority having jurisdiction). Maximum conduit "fill" shall not exceed 40% per NEC.

3.2 TESTING

A. Submit a written test report from an authorized representative of the equipment manufacturer that the system has been 100% tested and approved. Final test shall be witnessed by Owner, Engineer, Electrical Contractor and performed by the equipment supplier. Final test report must be received and acknowledged by the Owner prior to substantial completion.

B. Provide instruction as to proper use and operation of system, for the Owner's designated personnel.

3.3 SOFTWARE

A. Provide two electronic copies of the final programming and program software to the Owner's Facilities Safety and Security Manager after final approval.

END OF SECTION

SECTION 28 23 00

VIDEO SURVEILLANCE SYSTEMS

GENERAL

1.1 DESCRIPTION OF WORK
- A. Provide a complete system of surveillance cameras for all SAISD facilities.
  1. All aspects of this San Antonio Independent School District Physical Security System Standard shall be applied to the design process for both new and renovated facilities.
  2. A Division 28 specification and TS-Series drawings shall be commissioned and issued by the Architect during the design phases for each facility or project.

PRODUCTS

2.1 GENERAL
- A. Video Surveillance System (VSS) Standards
  1. Field Hardware
     - a. All VSS electronics will be turn-key solutions installed utilizing a physical security systems contractor hired directly by a general contractor.
     - b. This section will address device locations, power, conduit and rough-in requirements required by the architectural design team to support the VSS electronics
     - ~~c. Acceptable equipment manufacturers including cameras, servers and UPSs will be provided by the Police Department as soon as requested.~~ A list of acceptable equipment manufacturers will be approved by the Police Department upon request from assigned SAISD Project Manager.
     - d. VSS Software and storage
       1. District has standardized on using Verkada VSS software and Verkada cameras or approved equal.
       2. Each camera shall maintain a minimum of 30 days of on-camera storage video for all cameras on the system. 24 FPS, 24/7 recording is standard with the Verkada system or approved equal
       3. For a full listing of Verkada product information such as product spec sheets and installation guides see https://www.verkada.com/docs/.
       4. For a comprehensive knowledge base on setting up and using Verkada products and web-based central management system called “Command” see https://help.verkada.com/en/.
     - ~~e. Camera Power Supplies shall be 24v AC to support 16 cameras and be installed in MDF room locations, Altronix AL624.~~ Camera power supplied through power over ethernet plus (POE+) switches
     - ~~f. SAISD will provide and install digital video recording equipment remote PC based.~~ Security Camera Cabling- ***refer to division 26***
     - ~~g. SAISD will provide and install UPS equipment.~~

~~h. Security Camera Cabling- ***verify with SAISD the latest cabling technology to be installed.***~~

~~i. Within 10'-0 of each end of security video cabling, contractor to install plenum rated, RG59 white in color to convert UTP device to coaxial connection. Install BNC connectors on each end.~~

~~j. In cases where cat 5 cabling is used, provide individual videobalun (BL4865 or BL3265) at camera and at head end.~~

B. Interior Wall Mounted Cameras

1. General
   a. Wall mounted cameras will be mounted within 6" of ceiling but not lower than 8'-6" and no higher than 10'-0.
   ~~b. Verkada offers 3 types of surface-mounted indoor cameras with 30 days of on board storage- standard domes, mini domes and fisheye. Refer to https://www.verkada.com/compare/ for a full listing of Verkada cameras.~~
   SAISD requires dome surface-mounted indoor cameras with 30 days of on-board storage and a 10-year license preferred.

2. Power
   a. The camera shall be powered by a PoE network switch located within the nearest IDF or MDF.

3. Network Drops
   a. Provide one (1) Yellow Category 6 cable with length no more than 275' for data at each IP camera location. ~~Coordinate data drop locations with Police Department~~
   b. Terminate the security network drop in the security patch panel and provide and install yellow 1' patch cord in the patch panel side and yellow 15' patch cord in the camera side.
   c. Grid work will be labeled with a black label with white lettering with the MDF/IDF number and port number at both the camera and MDF/IDF sides.

C. Interior Ceiling Mounted Cameras

1. General
   a. Ceiling mounted cameras will be mounted within the accessible ceiling tile or hard ceiling.
   b. Ceiling mounted cameras shall be provided with support struts between ceiling grid and tie off to structure above.
   ~~c. The same Verkada indoor camera models described above apply here as well.~~
   SAISD requires dome surface-mounted indoor cameras with 30 days of on-board storage and a 10-year license preferred.

2. Power
   a. The camera shall be powered by a PoE network switch located within the nearest IDF or MDF.

3. Network Drops
   ~~a. Provide one (1) Yellow Category 6 cable with length no more than 275' for data at each IP camera location. Coordinate data drop locations with Police Department~~
   verify with SAISD the latest cabling technology to be installed.

   ~~b. Terminate the security network drop in the security patch panel and~~

~~provide and install yellow 1' patch cord in the patch panel side and yellow 15' patch cord in the camera side.~~

c. Grid work will be labeled with a black label with white lettering with the MDF/IDF number and port number at both the camera and MDF/IDF sides.

D. Exterior Wall Mounted Cameras

1. General
   a. For all canopy and exterior cameras and cabling, use outdoor rated cables
   b. Wall mounted cameras will be mounted between 9'-0" A.F.F. and 15'-0" A.F.F depending on wall design and landscaping obstructions.
   c. ~~Verkada offers 3 types of surface-mounted indoor cameras with 30 days of on-board storage: standard domes, bullet cameras and fisheye.~~ Acceptable camera types are standard domes, bullet cameras or fisheye surface-mounted exterior cameras with 30 days of on-board storage and a 10 year license preferred.
   d. For cameras ~~in such a way that they are~~ fully exposed to weather elements (on light poles, sides of buildings, etc.) ~~Verkada recommends using the Bullet cameras.~~ SAISD requires using Bullet cameras.
   e. ~~Cameras mounted outdoors but underneath walkways, awnings or in other covered areas, Verkada recommends using the Standard Dome cameras.~~
      SAISD requires using the Standard Dome cameras when mounted under ten feet or underneath covered areas,
   f. ~~While all Verkada cameras are surface-mounted, Standard Dome, Bullet and Fisheye cameras can also be mounted directly to a 4" Square junction box, Single gang junction box, 3.5" Round junction box, 4" Round junction box and directly to a pole using worm gear hose/pipe clamps~~.

      SAISD requires Verkada angle mount for Fisheye cameras with panoramic views. Fisheye cameras shall only be installed in areas where a broad view is acceptable i.e. parking areas, large fields, and playgrounds.

   g. The installation of weatherproof surface mounted single gang service box is required on all outside cameras (installed below camera) and on the inside cameras (installed above camera) where there is not a dropped ceiling. This service box is for testing of video and power cables.
2. Power
   a. The camera shall be power from PoE network switch located within the nearest IDF or MDF.
3. Network Drops
   a. ~~Provide one (1) Yellow Category 6 cable with length no more than 275' for data at each IP camera location. Coordinate data drop locations with Police Department~~
      verify with SAISD the latest cabling technology to be installed.
   b. ~~Terminate the security network drop in the security patch panel and provide and install yellow 1' patch cord in the patch panel side and yellow 15' patch cord in the camera side.~~

Interior grid work closest to the exterior camera will be labeled with a black label with white lettering with the MDF/IDF number and port number at both the camera and MDF/IDF sides.

c. Network cables will be weatherproofed to prevent water from entering the wire and the building, conducting current or damaging network or camera hardware

E. Exterior Pole Mounted Cameras

1. General
   a. For all canopy and exterior cameras and cabling, use outdoor rated cables
   b. Project site will be prepped for future pole mounted cameras.
   c. Pole mounted cameras will be mounted at 15'-0" A.F.F. Coordinate with lighting poles.
   d. All of Verkada's outdoor camera models can be pole-mounted using Verkada mounts. See https://www.verkada.com/docs/accessories-list.pdf for a full listing of Verkada's mount accessories including camera-to-mount and mount-to-mount compatibility.
2. Power
   a. Provide weather-proof-enclosure of 12"x12" at 13' AFF.
   b. Camera shall be powered from PoE network switch located within the nearest IDF or MDF.
3. Network Drops
   a. ~~Provide network connectivity via weather-rated- OPS Cat6 cable and appropriate media convertors on injectors if this cable exceeds 275' of length~~ ***Verify with SAISD the latest cabling technology to be installed.***
   b. Pole will be labeled so visible from the ground without aid of ladder but protected from easy removal, showing the location of cable termination within MDF/IDF.

~~a. Provide surge suppressor for all exterior mounted cameras in MDF-RM or IDF-RM~~

~~b. Surge suppression shall be configured to protect video, power and data wiring for exterior cameras.~~

F. Exterior Camera Housing

1. General
   a. For all canopy and exterior cameras and cabling, use outdoor rated cables
   b. All exterior cameras shall be equipped with arm mount and pendant cap. Verkada mounts ACC-MNT-2 and ACC-MNT-8 respectively.
   c. Pole-mounted cameras also require Verkada mount ACC-MNT-9.

G. Typical Camera Quantities based on building design and layout

1. Numbers listed below are the typical number of cameras based on school type. Specific number of cameras should be designed for specific site conditions and as deemed necessary by SAISD Program Manager. The counts noted below are a baseline minimum for a new facility and are not meant to be inclusive of all areas required to be covered under this scope of work.

Design of camera layout must comply with areas of coverage listed below and depend on overall school layout and function of campus. Review placement and number of cameras with Owner prior to project being issued. Ongoing coordination will be required by assigned SAISD Project Manager with SAISD Police Department on the minimum coverage needed on a case-by-case basis.

a. Elementary and Pre Kindergarten Centers – 32 cameras (min.)
b. Middle Schools – 64 cameras (min.)
c. High Schools – 96 cameras (min.)

H. Interior Areas Requiring Video Surveillance

1. ~~All Building entrances from exterior into corridors, provide interior camera near entrance to focus on face (not top of head) of person entering , with additional corridor camera viewing door and length of corridor from a distance.~~
   a. ~~Where capturing faces is key, Verkada recommends using 8MP "4K" cameras (CD61, CM61, and CB61). Ideally, cameras should be mounted as close to eye level as possible to achieve best visibility of faces. In some cases, it may be better to wall-mount a camera that is adjacent to an entrance/door rather than mounting the camera to the ceiling with the lens pointing at a steeper downward angle.~~

   Every exterior entry exit door should have a camera installed focused on the faces of those entering the building.
   a. Camera shall have face recognition capability.

2. Corridors ~~to be covered with camera layout overlapping 75' maximum per camera.~~
   A. All Corridors shall have full VSS coverage.
   B. A camera shall be installed at the entrance facing down the corridor
   C. Corridor cameras shall be installed in an overlapping fashion eliminating all blind spots by crossing coverage.

3. Commons Areas ~~Student Dining Commons and Multi-Purpose Rooms area shall receive two (2) cameras minimum in tamper resistant housing.~~
   A. Student dining, serving lines, auditoriums, gyms, libraries, learning commons, and multi-purpose areas shall receive full coverage with no blind spots.
   B. Restroom entrance/exits shall be covered to view faces of persons entering or exiting restrooms.
   C. Stairwells shall receive cameras to cover landing and steps per floor.

4. Main Office Areas ~~Restroom entrance/exits shall be covered from both sides of corridor longitudinally to view faces of persons entering or exiting restrooms.~~
   A. Vestibules shall receive full video coverage.
   B. Reception shall receive cameras to view general transactions.

5. ~~Computer labs to receive cameras to monitor equipment in case of theft.~~ MDF corridor to receive camera to view entry if not included in corridor view

6. **Special Education classrooms as determined by SAISD requirements.**

7. ~~Video Conferencing Lab to receive camera to monitor workstation, podium and related A/V equipment~~.
   Exterior cameras monitor parking areas, playground areas, fields, bus loading/unloading, windows, blind spots, kitchen delivery entrance and

chiller yard.

~~8. Gymnasiums shall receive two (2) cameras minimum, one (1) on each end, installed in opposite corners of gym.~~
~~9. Provide camera in the main reception area.~~
~~10. Learning Commons shall receive cameras to view circulation desk, entry/exit to Learning Commons and media area.~~
~~11. Exterior cameras to monitor parking areas, playground areas, bus loading/unloading and kitchen delivery entrance.~~
~~12. Each campus shall be allowed to select placement of 10% of the total camera count to address specific items related to that campus.~~

I. Exterior Cameras
1. Every entry door shall have camera coverage.
2. Student Drop Off
   a. Cameras shall cover entrance and exits of drop off area.
   b. Camera shall be able to identify the make and model of vehicles.
3. Exterior Common Areas
   a. Parking lots, playgrounds, fields, transition walkways and chiller yards shall have complete coverage including entrances and exits.
4. Loading docks shall have a camera to capture loading and unloading.

J. Removal and Storage: General contractor is responsible for inventory, removing, storing, and re-installing all devices and equipment which are not going to be replaced in the renovated area. The general contractor shall coordinate a test of VSS with the police department and subcontractor and create a transmittal of all devices and equipment to be removed. All removed cameras shall be inventoried and protected with bubble wrap and returned to the district, if not reinstalled. Coordinate with assigned SAISD Project Manager (in coordination effort with SAISD Life Safety Team) for drop off locations.

2.2 LABELING
1. Security Cables
   a. Security Cables shall be labeled within 12 inches from the termination point inside the MDF/IDF.
   b. Security Cables shall be labeled within 12 inches from the termination point at the security device in the field.
   c. All wiring shall be labeled sequentially and alphanumerically, for example: a. VSS = C1, C2, C3, etc.
   d. Cables shall be labeled identically at both ends.

2.3 PROJECT COMPLETION
1. Install the VSS in accordance with the project schedule.
~~2. Upon completion of the Security Contractor testing and coordination, the Owner and the Owner's representative will conduct a final acceptance test.~~
Provide facility map with cameras' identification numbers and serial numbers in VSS software, and provide document with camera numbers, serial numbers, IDF number, Switch number, and port number per camera for programming. Contact SAISD Life Safety team for further instructions.

~~3. Provide facility map with cameras' identification numbers in VSS software~~
Upon completion of the Security Contractor testing and coordination, the SAISD Life Safety team will conduct a final acceptance test and verify proper views.

4. Provide facility maps with cameras' identification numbers and serial numbers in VSS software for closeout documents.
5. The Owner or Owner's representative will prepare a punch list of items identified during the test that require correction.
6. All final walkthroughs of complete installation and delivery of spare or accessory products must be scheduled and signed off by SAISD Police Department. All final delivery of products must have a sign off receipt from contractor to SAISD Police Department and signed receipt of delivery included in the close out documents.

EXECUTION

3.1 INSTALLATION

A. Cable Support: all wire not installed inside conduit, or a designated cable tray system shall be installed in a dedicated cable support system for the entire run of each cable.

B. Do not install wall mounted cameras into metal fascia. Ensure they are mounted into brick, and sealed top and sides (not bottom).

C. Cabling between wiring closet and camera locations shall be made as individual home runs. No intermediate splices may be installed or utilized between the wiring closet and the camera location.

~~D. Cameras routed to an IDF, then routed from the same IDF to the MDF must be transitioned using a 25-pair cable w/ video baluns.~~

~~E. Contractor is responsible to run and connect cable to DMR.~~

3.2 CABLE TESTING – BY MANUFACTURER'S REQUIREMENTS

A. Notification: The Owner/Architect/Engineer shall be notified one week prior to any testing so that the testing may be witnessed.

B. Final Acceptance: Before requesting a final acceptance, the Contractor shall perform a series of end-to-end installation performance tests. The Contractor shall submit for approval a proposal describing the test procedures, test result forms and timetable for all copper and fiber optic cabling.

C. Procedures: Trained personnel shall perform all testing. Acceptance of the test procedures discussed below is predicated on the Contractor's use of the recommended products and adherence to the inspection requirements and practices set forth. Acceptance of the completed installation shall be evaluated in the context of each of these factors.

D. Errors: When errors are found, the source of each error shall be determined, corrected and the cable retested. All defective components shall be replaced and retested. Retest results must be entered on the test results form. All corrections shall be made prior to the final acceptance test.

END OF SECTION

SECTION 28 31 00

FIRE DETECTION AND ALARM

GENERAL

1.1 SUMMARY

A. The contractor shall Design, furnish and install a complete distributed microprocessor based 24VDC, electrically supervised, Farenhyt IFP-1000 or Silent Knight 6820 XL fire alarm system or approved equal as specified herein. The system shall include, but not be limited to, all control equipment, remote transponders, power supplies, signal initiating and signaling devices, conduit, wire, fittings, and all other accessories required to provide a complete and operable system.

B. The system shall operate as a non-coded, continuous ringing system which will sound alarm devices until manually silenced, as herein specified.

C. The system shall be wired as a Class B and style 4 supervised system for all circuits.

D. System shall have a minimum of two loops and wired to allow expansion of each loop.

E. The contractor shall provide a backup copy of the installed program database upon completion of the project. They shall also provide the current version of VeriFire-TCD for the panel provided.

F. Install a pull station cover with horn (STI-Stopper II) at every pullstation.

G. By Fire Code, ground insulation is required on all fire alarm cabling when leaving and entering the buildings. (SLC & Notification, S-Bus)

H. All underground cabling must be rated direct burial – no exceptions.

I. To the maximum feasible, contractor to provide a fire alarm system that is non proprietary for future maintenance.

1.2 CONTRACTOR QUALIFICATIONS

A. The installing contractor shall be the authorized representative of the Fire Alarm Manufacturer to sell, install, and service the proposed manufacturer's equipment. The installing contractor shall have represented the fire alarm manufacturer's product for at least two years.

B. The installing contractor shall be licensed by the State Fire Marshall to sell, install, and service fire alarm systems as required by Article 5.43-2 of the Texas Insurance Code.

C. The installing contractor shall have on his staff an installation technician licensed by the State Fire Marshall's office for such purpose and under whose supervision installation, final connections, and check out will take place as required by the Texas Insurance Code.

D. The installing contractor or equipment supplier shall have on staff a minimum of two (2) certified NICET Level III state licensed fire alarm planning superintendents under whose supervision system design shall take place. In lieu of an alarm planning superintendent, the contractor may provide design supervision by a registered professional engineer.

E. The installing contractor shall provide 24 hour, 365 days per year emergency service with factory trained, state licensed service technicians.

F. The installing contractor shall have been actively engaged in the business of selling, installing, and servicing fire alarm systems in the surrounding area for at least ten (10) years.

PRODUCTS

2.1 SYSTEM FUNCTIONAL OPERATION

A. Fire alarm contractor shall hold current certification to install and support Farenhyt fire alarm systems by Silent Knight or approved equal or Silent Knight certification.

B. The required fire alarm and evacuation system is to provide a system with the following functions and operation:

1. Locate main fire alarm panel in MDF room.
2. Provide a lightening protection kit.
3. Performance Requirements:
   a. The automatic battery charger shall be capable of charging a fully discharged battery to 70% capacity in 12 hours.
   b. The fire alarm control panel shall be Silent Knight IFP-1000 or Silent Knight 6820 XL. All sub- panels shall be analog addressable (i.e. Power Booster) Silent Knight Model #5895XL or RPS-1000.
4. All control panel and power booster batteries shall be 12 volt 18 amp or higher, no exceptions shall obtain its primary operating power from a 120 BAC single- phase 60 Hx supply provided with a dedicated and secured disconnect switch.
5. The fire alarm and evacuation system shall comply with NFPA 72 and all applicable local codes. Provide horn/strobe and smoke detectors at all Pre-K and Kindergarten learning centers.
6. All Control panel batteries shall be 12Volt 18amp hour or greater. Installation dates should be clearly marked on batteries.
7. All wiring shall be non-power, unlimited power supply or plenum rated.
8. Panel programming shall include device descriptions and zoning per floor per building (i.e. zone 1= main building first floor Administrative Suite, zone 2= main building first floor corridor east, zone 3=main building learning centers). Panel programming shall be supplied to owner via a hardcopy and electronic.

C. Installation

1. All wiring shall be in compliance with NEC, local building codes and Article 760 of NFPA Standard 70.
   a. Fire Alarm wiring shall be U.L.L. approved and not less than #18 gauge.
   b. Wiring conduits should not be used for any purpose other than fire alarm wiring. (No Exceptions)
   c. All wiring shall be color coated and marked at each termination or junction box indicating the circuit served (i.e. power supply).
   d. All sub-panels shall be located in the MDF, IDF, electrical closet or mechanical rooms only.
   e. All junction boxes including the cover are to be painted red in color for identification purposes.
   f. All wiring or use plenum rated cable installed in conduit – EMT for indoors and IMC for outdoors.
   g. All sensors shall be photo detection. All duct detectors shall be analog addressable photo detection.
   h. Horn/Strobe wiring shall be four wiring conductor cable to separate the strobe from the horn and ANSI purposes.
2. All control panels and sub panels shall clearly indicate electrical breaker location, including room number, panel number and breaker number.
3. All horn strobes, speaker strobes or strobes to be wall mounted or ceiling mounted as required by NFPA 72 and/or applicable building codes.
4. All final programming shall be completed using final room number graphics plan.

5. Provide annunciator panel in front office area
6. All devices shall be labeled as follows: Module/Point # (Ex. M97:001)
7. All underground cabling must be rated direct burial - no exceptions.

D. Test and Reports
1. A trained technical representative of the equipment supplier shall supervise the final control panel connections and testing of the system. Upon completion of the acceptance test the San Antonio ISD Maintenance Department will be instructed in the proper operation of the system.
2. The installation contractor shall functionally test each and every device in the entire system for purposes of operation and response. Written certification shall be provided upon completion of the test.

E. Contractor shall be made responsible for maintaining existing fire alarm operational throughout construction duration. In certain cases, the existing fire alarm equipment is currently under warranty from the initial installation. If the contractor requires the temporary or permanent relocation of fire alarm devices in order to complete contractor's work, then contractor will be responsible for disconnecting, removing, securing, protecting, reinstalling, re-testing and re-certifying such equipment or system. The installing vendor listed below must perform any alteration to the existing fire alarm system. Contractor is responsible for all costs and coordination of any disconnection, removal, shunting, reconnection, testing, and re-certification of the fire alarm system required to accomplish the renovation work and receive certificates of certification from the City of San Antonio Fire Department.

EXECUTION

3.1 FUNCTIONS

A. Alarm System Automatic Functions:
1. Upon the operation on any sprinkler flow switch, manual pull station, or detector:
a. Signal the Fire Alarm Control Panel. Identify the addressable point at the Fire Alarm Control Panel and the remote fire alarm annunciator.
b. Sound a distinctive evacuation signal throughout the entire building.
c. Simultaneously activate all flashing visual alarm assemblies associated with audible indictors.
d. Shut down all mechanical equipment rated 2000 cfm or greater that circulate air for that floor. This equipment shall include, but shall not be limited to, air handling units, ventilation fans, fan powered boxes, and side pocket boxes. Coordinate with Division 15 Specification Section Air Conditioning Controls as required for passive smoke control.
e. Close all smoke control dampers. Provide control relay within three (3) feet of each damper or power supply for motor drives or fail-safe dampers. When fail-safe smoke dampers are powered in parallel from a common power circuit then fire alarm relay may be provided to interrupt common power circuit; separate relay not necessary at every such damper. Install supervised fire alarm wiring from relay to fire alarm control panel. Resetting fire alarm system shall include opening smoke control dampers.
f. Activate and automate telephone dialer and alarm contact closure for use with approved central station monitoring service.
g. Release all fire and smoke control doors on hold-open devices so that doors may close.
h. Kitchen:
a) Operation of any kitchen hood fire suppression system

shall initiate the alarm building fire alarm control panel. Building fire alarm system shall sound alarm over appropriate notification appliance circuits as required by NFPA 72 sect. 3-8.8.1. Comply with NFPA 96 Standard for Commercial Cooking Operations, sect. 7-3.1.4. Actuation of a dry chemical shall cause building fire alarm per NFPA 17 sect. 3-7.4. Actuation of a wet chemical system shall cause building fire alarm per NFPA 17 sect. 3-2.1.5

i. Sprinkler System:
   a) Operation of any sprinkler system water flow switch shall activate the sprinkler alarm bell.

j. All alarm signals shall continue sounding and annunciator(s) shall remain lighted until the alarm acknowledged switch is depressed. The alarm signals shall then stop, but the annunciator shall remain lighted until the system is rest.

k. Acknowledging of any alarm signal shall interfere with the re-activating of the alarm signals upon an alarm from another zone.

l. Alarm Verification:
   a) Provide UL listed alarm verification feature.
   b) Alarm verification shall be per addressable, open area smoke detector. Alarm verification shall be field programmable on an individual detector basis. Global or Dydte, alarm verification will be unacceptable.
   c) If an alarm condition is detected by an automatic smoke detector programmed for ALARM VERIFICATION, an alarm verification sequence shall be initiated. Upon receipt of the initial alarm condition, start the verification sequence as prescribed by UL 864. The system shall rest the alarmed zone/device within the UL prescribed window of 60 seconds maximum. If the alarm condition does not confirm within 60 seconds of the reset signal, the programmed alarm outputs shall be canceled, and the system returned to the normal mode. If the alarm condition re-occurs within the designated verification cycle or a non-verified device or zone activates, the programmed events listed above shall immediately occur for the confirmed alarm condition.
   d) Alarm verification shall not be used for any spaces programmed to required two smoke detectors to initiate an alarm response (ex. elevator lobbies), per NFPA 72-1993 Sect. 3-8.2.5.

3.2 WALK TEST

A. Notify the Owner, Architect and Engineer when system is 100 percent operational. Schedule walk-through of the entire facility and verify that each initiating and each indicating device is operating properly.

B. Provide report at conclusion of walk through certifying all fire alarm devices are working.

C. Walk test shall include a representative from owner maintenance department.

D. Walk test to show in a printed report all AHU shutdown, Sprinkler Tamper Report, Sprinkler Flow switch, strobes/horns, and smoke detectors. Report shall list all devices by approximate location to rooms, and device number. All duct detectors shall include flow differential at the detector as measured by a manometer. Manometer reading shall match manufacturer's specification for duct detector used.

3.3 SOFTWARE

A. Installer shall provide a backup copy of the installed program database upon completion of the project. They shall also provide the current version of VeriFire-TCD (CD Software) for the panel provided.

END OF SECTION

SECTION 32 05 00

EXTERIOR IMPROVEMENTS COMMON WORK RESULTS

GENERAL

1.1 ***The architect should provide proper coordination of all fire lanes with the Fire Marshall.***

1.2 Accessible loading zones shall be marked to comply with TDLR and other applicable codes and regulations.

1.3 Permeable paving shall be an accepted form of site detention and shall be coordinated with the civil engineer.

1.4 At a minimum, all curbs located between approved Fire Lane - Tow-Away Zone signs shall be painted RED or a RED stripe shall be placed along the pavement where there is no curb. These curbs shall also be conspicuously and legibly marked with the warning "**FIRE LANE - TOW AWAY ZONE**" in WHITE letters at least three inches in height, at intervals not exceeding fifty feet.

Any color other than red may be used in "**NO PARKING**" areas that are not approved Fire Lanes. RED colored curbs, pavement striping or wheel stops shall be used only to designated approved Fire Lanes except where authorized by the Code Official. Additional areas may be required by code and/or Fire marshal reviews. Field verify fire lane locations with City of San Antonio School Team Fire Marshall.

1.5 The ground floor elevation should be established with as much foresight as possible, considering the capacity of major off site drainage ways, potential for increased development in the area, and the historical high water levels in the neighborhood. This may result in a first floor elevation higher than the code required elevation.

1.6 An irrigation system is to be included for each area that is landscaped since past experience indicates that this is necessary for plant survival. Irrigation of trees throughout a campus beyond the practical extent for a full irrigation system should be accomplished with stream bubblers.

1.7 Foundation planting along the base of the building is discouraged due to high maintenance and water penetration. Landscaping should be established with as much foresight as possible, considering amount of irrigation required, drought conditions and location to the proposed construction. Ensure that new landscaping is not planted too close to the building foundation that will cause future structural issues.

1.8 Planting improvements should reinforce an environment conducive to learning and high self-esteem. Simplicity in design and maintenance is encouraged. The creation of tall screening in the landscape that prohibits visual surveillance of the campus is ~~discouraged~~ prohibited. Improvements should emphasize trees and lawns but will also entail proportionately small amounts of ground covers, low shrubs, vines and perennials. Indigenous and native materials are ~~encouraged~~ required.

1.9 All grassed areas affected by construction shall be resodded by the contractor with a grass similar to existing. All construction projects should include topsoil, fertilization and seeding (type depends on season) with a full stand of grass being the point of transfer of responsibility from contractor to Owner.

1.10 Drainage line discharge outlets exceeding 12" diameter require a grating or other device to prevent entrance by small children. Area drain gratings shall have narrow-slot openings of maximum 3/4" width, and shall be "heavy-duty" grade at all locations.

1.11 Provide a one-way bus drop-off lane at a canopy connecting to a building entry, separate from other traffic access, including automobile drop-off; canopy is not required to extend over the drive lane. If new canopy provided, then canopy shall fully extend over new passenger curb ramp provided at bus drop off.

~~Concrete paving is required to be designed to accommodate heavy bus loads at peak pickup hours. Reference geotechnical report for additional requirements concerning fill placement and pad preparation. Reference soils report for paving section and subgrade preparation~~.

1.12 Provide a one-way automobile drop-off access at a canopy connecting to a building entry, separate from other traffic access, including bus drop-off; canopy is not required to extend over the drive lane. ~~If new canopy provided, then canopy shall fully extend over new passenger curb ramp provided at parent drop off zone.~~ Provide canopy area for weather protection at a minimum height of 9'-0". Roofs should be held back 36" minimum form curbs on a radium section. Bus drop-off should provide easy access to commons. Provide concrete paved drive with a m30'minimum width is preferred. Provide pedestrian light for early morning and evening loading area activities. Accessible loading zone and handicap curbs shall be provided. Designate loading areas with signs and markings.

COVERED WALKS / CANOPIES: Covered walks shall be of adequate height to deter climbing and other forms of vandalism. Ensure that the water management system is well coordinated with the Civil engineer. ~~On sites with high PVR connect downspouts to the underground storm drain system.~~ When designing the canopy system, ensure that the downspouts are discharged to an underground storm drainage system. If this is not possible, downspouts shall not be discharged at or near entrances. The structural support for the canopy system must be coordinated with the Geotechnical engineer, and the impact of expansive soil must be considered by the structural engineer, geotechnical engineer, civil engineer and Architect when the canopy is attach to the building.

1.13 All driveways and parking shall be ~~concrete~~ asphalt paving. ~~No asphalt will be allowed except for patching and topping of existing asphalt and with SAISD Program Manager approval only.~~ Both asphalt and concrete should be considered based upon economic and geological considerations as determined by Geotechnical report unless specifically noted otherwise. Provide concrete paving at the driveway aprons, bus drop-off, dumpster pad, and service yard.

1.14 Paving for service areas should be designed for heavy truck loading and have storm drainage inlets.

1.15 No completely enclosed exterior courtyards are allowed. Courtyards, if any, must be open at one side, such as U-shaped; and the open side, if fenced, must have a gate that complies with exit requirements, including exit hardware.

1.16 For site ramps and stairs, provide handrails that are of simple design, galvanized and painted, not aluminum or custom detailed.

1.17 Service access and service drives shall be separated from other vehicular access.

1.18 Playground equipment shall be placed in such a location that will afford maximum security and maintain site lines within the school perimeter. When selecting a location to plant a tree near the Playground area, the mature size of the tree should be considered so that it does not block the view of the video cameras.

1.19 Finish grading shall have a tolerance of plus or minus ½".

1.20 Speed bumps shall be per City of San Antonio standard detail.

1.21 All retaining walls with a height of 5'-0" or greater or walls subjected to surcharge loading shall be designed by a professional engineer and the drawings shall be sealed accordingly. Consideration must be given to the need for guardrails for fall protection. Provide railing and guardrails where needed for safety and protection.

1.22 Planting

A. The following guidelines establish standard for planting and related appurtenances, but are not complete technical specifications. The Consultant is encouraged to consider these a basis for design, documentation, and specifications, but shall also assure their compatibility to the specific site.

B. Use native, drought-tolerant plantings that can tolerate periods of saturation.

C. Any landscaping beyond code requirements should be minimized. Do not design large planting beds which are a maintenance problem.

D. Foundation planting is discouraged. Flowering trees away from the building is preferred.

E. SAISD written approval is required to include any plant material not covered by an automatic irrigation system other than large play fields and lawns.

F. Due to cost, large lawn areas should be hydromulched and not sodded. Exceptions should be reviewed with SAISD and may involve time of year and construction schedules.

G. Edging is required in each location between a planting bed and lawn areas. Edging can be steel or recycled plastic.

H. Side slope so storm water detention areas should be carefully considered and specifications should include establishing a lawn, not just an application of hydromulch. To establish lawn may require topsoil, erosion control, sodding, and irrigation.

I. Obtain approved plant list from SAISD project manager before any plant selections are determined.

J. Provide a growth period for plant, sod and hydromulch establishment as recommended by the Landscape Architect

1.24 Other Site Elements Consideration

PARKING: Consider existing parking counts at existing schools.

STAFF PARKING AREA: Must meet minimum standards established by City or County. Preferred number of spaces would be two (2) parking spaces per full size classroom. Included within this area should be handicap parking spaces.

PARENT PARKING AREA: Preferred number of spaces would be one (1) parking space per number of full size classrooms. Included within this area should be handicap parking spaces. Parking can be adjacent to staff parking, but must be distinctly set aside.

TOTAL PARKING: Comply with ~~City of San Antonio Ordinance~~ the Interlocal Agreement Between the City of San Antonio and Twelve Public Education Districts for the required number of parking stalls and queuing requirements. Minimum parking required by City ordinance in compliance with local, state, and federal regulations. ~~to be 140 spaces at campuses~~. Coordinate with the District as site conditions may warrant additional parking spaces.

PARENT DROP OFF: A parent drop-off area should be provided at the main entry to the school, with one-way preferred. Accessible loading zone and handicap curbs required. Provide a canopy for weather protection at a minimum height of 9'-0" and 12" back from the curb line. Provide a minimum 25 foot driveway width and parent parking nearby.

BUS LOOP: Provide parking for three (3) buses, queuing for three (3) additional buses. Bus loop drive should be separate from parent drop-off loop. Accessible loading zone and handicap curbs are required. Provide a covered area for weather protection at a minimum height of 9'-0". Roofs should be held back 36" minimum from curbs on a radius sections and 12" back on straight curb sections. Bus drop-off should provide easy access to cafeteria and/or gym. Provide concrete paved drive with a 25-foot minimum width, and 30-foot radius on the turns.

PAVING, CURBS, & FLATWORK: Asphalt and concrete paving to be designed by Civil Engineer based on Geotechnical Engineer's recommendations, minimum asphalt thickness, for fire lanes, drives and parking lots. Concrete paving only at bus loops, dumpster pads and approaches and equipment pads. Install asphalt paving over asphalt treated "black base." Concrete curbs to be 18" deep with 2 #3 reinforcing bars, minimum. Machine laid with express written permission of SAISD only. On expansive soil sites avoid placing flatwork directly adjacent/or abutting the building masonry exterior walls.

SITE FENCING: Provide a perimeter fence along the property to secure the campus. Provide an ornamental steel fence ~~(Ameristar)~~ at areas where the fence fronts/faces a public-street. Provide vehicular width gate for maintenance access, and pedestrian gates. Provide ~~5'-0"~~ 6'-0" high perimeter fencing at Elementary schools, 6'-0" high at Middle & High schools. Pedestrian gates shall swing in the direction of egress and shall have panic hardware with security measures from non-egress side. Unless otherwise noted provide chain-link fencing at all other locations. At mechanical enclosures provide vandal resistant 3/8" chain-link fencing. Coordinate fence type for detention ponds with the District.

ELEMENTARY PLAYGROUND ENCLOSURES: Provide 4'-0" high ~~Ameristar~~ ornamental steel fence system at the playscape equipment areas.

BICYCLE RACKS: Located the in-ground mounted hot dipped galvanized wave bike racks near the bus drop-off or near the parent drop-off contingent on-site conditions. Provide sidewalk access to the two (2), five (5) bicycles capacity racks. Additional capacity maybe required depending on neighborhood conditions.

CHILLER YARD: The chiller yard shall have an 8' to 10' high masonry wall or building wall on three sides, and a chain link fence on the fourth side, with vandal resistant 3/8" chain-link and vehicular width gates. Provide proper vents in walls to satisfy air flow requirements and design for positive drainage away from the building throughout the yard. Provide a concrete slab. On sites with high PVR ensure chillers are on concrete piers, as well as any major pipe support members. Provide LED wall pack light fixtures with emergency power to illuminate the chiller yard for security, and nighttime maintenance.

KITCHEN DOCK: Location should not interfere with bus pick-up or drop-off areas. Protect service door with awning. Provide doorbell that can be heard in the Kitchen. Provide security ~~adequate~~ lighting at the 42" wide kitchen service door. Provide trash can wash at service entry. Provide a slip-resistant concrete slab and slope to drain away from the building. Provide bollards & dock bumpers to prevent vehicles from hitting building or awning. Set awning back from dock to prevent potential damage from delivery vehicle. Provide space for trucks up to 30'-6" long 8'-0" wide and 12'-8" high to back up to door of Kitchen as closely as possible to unload supplies. Dock area shall be concrete with a drainage system at the lowest elevation. Provide curb ramp nearby dock area for hand trucks.

KNOX BOX/PAD LOCKS: Shall be Contractor provided and installed. Architect shall coordinate location and quantity with Fire Marshal during the design phase.

FLAGPOLE: Provide one 30' flagpole with 4 hooks near main entrance with lock box. Flagpole to be tapered spun aluminum with round ball, designed for two, 5' x 7' flags. Provide an accessible route to the flagpole

FOOT SCRAPERS: Provide at major entrances from play area only

LIGHTING: Facilities to have entry lighting, parking lighting and security pole lighting for evening use and facility security/safety. Lighting to be controlled by an automated energy management system

SIGNAGE: Provide and install code required fire lane and handicap graphics and signage. Provide and install traffic control, stop and yield signs and no parking or restricted parking signs and additional signage where directed by SAISD. Plan for the location of school zone traffic sign lights.

Provide fire lane signage and curb painting to identify no parking fire zones as required by County or City Ordinance. Fire lane curbs and the adjacent paving material to be painted red.

MARQUEE SIGN: The District prefers a 5'x8' double sided marquee sign with interchangeable letters. The District prefers pole mounted marquee over a monument sign. The latter will be dictated by City ordinance.

BUILDING IDENTIFICATION: Provide 12-inch high lettering for a building mounted sign with the District and school name, and street address. Ensure lettering provides visual contrast between signage and building finishes. Coordinate placement with SAISD.

1.25 Athletic Design Criteria – the following information are minimum criteria for acceptable athletic facilities. Each site will require its own unique design and specifications. In some cases, adjustments to these criteria may be acceptable pending approved design deviations as approved by assigned SAISD Project Manager.

1. **SITE FENCING:**
   - A. Tennis Court Fencing – 10' high chain link fence with wind screen.
   - B. Baseball/Softball/Batting Cage–
   - C. Batting Cages – Chain link cage 16'w x 12'h. Baseball requires two 70' long batting cages. The two Softball batting cages shall be 60' long. All pipe joints are to be welded to form rigid panels. Provide a duplex 120v electrical outlet at each cage for Owner provided pitching machine. Netting by Contractor.

2. **ATHLETIC AREAS:** All fields to be laid out in accordance with National Federation of State High School Associations guidelines. Provide an accessible route to all fields. Ensure all drainage grate are ADA compliant.

   A. FOOTBALL FIELD – Slope field ¼" per foot from center to each sideline. Field size is 300' long by 160' wide plus 30' each end for end zones. Provide minimum of 15' from each sideline for teams area. Goal posts to be of the single pole type with 6'-0" offsets and 20' uprights. The distance between the uprights shall be 23'-4" and shall comply with the requirements for high school competition. An upright protective padding shall be provided surrounding the vertical base pole to a height of 6'-0" above the playing field. Entire goal post shall be painted white. Provide 4' chain link fence between field and spectators with two 3' gates.

B. PRACTICE FIELD – Slope field ¼" per foot from center to each sideline. Field size to be 300' x 160' with 30' end zones and single goal post.

C. SOCCER FIELD – Provide field 80 yards wide 120 yards long as space permits. Field to have 1½ percent slope from center to each side.

D. SOFTBALL FIELD – Provide with 60' baselines. 180' radius from pitcher's mound to outfield with 8' treated ¾" plywood primed & painted outfield fence (angled support bracing are not acceptable), 4' chain link fence along foul line, 25' from baseline to sideline fence. Configure the Bullpen & Batting Cage side by side, provide electrical outlets for each area.

E. BASEBALL FIELD – Regulation size. Baseline 90' with 300' outfield with 8' treated ¾" (Marine Grade) plywood primed & painted outfield fence (angled support bracing are not acceptable), 4' chain link fence along foul line. Configure the Bullpen & Batting Cage side by side, provide electrical outlets for each area.

F. TRACK & FIELD: 8-lane 400-meter track with 100' extensions at each end of track.
   a. Slope requirements: Lateral 2:100 to the inside 1:1,000 in running direction.
   b. Provide flush concrete curb around perimeter.
   c. Surface shall be impermeable polyurethane covered with structural spray to include long jump, pole vault runways, and "D" zones. Product shall be IAAF certified as shall the design of the track.
   d. Provide a perimeter drainage system.
   e. To the maximum extent feasible, track to surround football field.

G. TENNIS COURTS – Courts to be concrete with a court surfacing system of multiple layer coating system specifically designed for use as tennis court surface coating, all components shall be furnished by a single manufacturer. System shall include preparer, binder and or primer, as necessary, 1 coat acrylic surface, 2 coats of 100% acrylic filler and 3 coats of textured color surfacing.
   a. Subsurface Drainage: Pitch tennis courts in 1 in. per 10 ft. for porous and nonporous courts. Each court should be constructed in one plane and should pitch from side to side; never up or down to middle court.
   b. Electrical: Provide 110v weather proof outlets at 50% of the courts.
   c. Potable water: Provide an accessible drinking fountain nearby.

TABLE OF CONTENTS

SECTION 32 12 16

ASPHALT PAVING

GENERAL

1.1 Asphalt Paving shall be only used for resurfacing existing asphalt paving only. All new paving shall be concrete

1.2 Require a warranty for the work against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials or workmanship
- A. Defects shall include, but not be limited to the following:
  1. "Fatty" or "Lean" areas that show surface failure.
  2. Areas that puddle water in excess of 1/2 inch deep where the designed slope is at least 1/4 inch per foot.
  3. Becoming tacky.

PRODUCTS

2.1 Tack coat: RC-2, Texas Department of Transportation Item 300.

2.2 Hot-Mix Asphalt Paving: Texas Department of Transportation Item 340, Type D. The paving mixtures shall consist of a uniform mixture of aggregate, hot asphalt cement, and additives if allowed or required. The mix shall be designed in accordance with TXDOT Construction Bulletin C-14 and Test Method Tex-204-F. The mixture shall be designed to produce an acceptable mixture at an optimum density of 96.0 percent, when tested in accordance with Text Method Tex-207-F and Text Method Tex-227-F.

2.3 The operating range for control of laboratory density during production shall be optimum density plus or minus 1.5 percent. The materials used in the mixture design shall produce a mixture with a stability value of at least 35, unless otherwise shown on the Drawings, when tested in accordance with Text Method Tex-208-F.

2.4 Pavement Markings
- A. Type: Latex, water based paint intended for use in marking parking lots and roads and complying with FS TT-P-1952B. Apply at manufacturers recommended rates to provide minimum 12 to 15 mils dry thickness
- B. Stripe Size: Four inches wide for traffic and parking lanes, unless noted otherwise.
- C. Colors: Traffic and Parking Striping: Yellow or white as selected by Architect and SAISD Program Manager.
- D. Fire lane, accessible parking and access aisles shall be determined by the Architect.

EXECUTION

3.1 The architect should include the following requirements in their specification and include additional directives as necessary for the project.

3.2 Placing Topping:
- A. Temperature: Provide mix at minimum 225 degrees F., when dumped from mixer.
- B. Clean Base: Remove loose material, dust, dirt and other foreign materials from the base course.
- C. Tack Coat: Apply 0.05 to 0.2 gal. per sq. yd.
- D. Compaction: Compact topping to 95 percent by on-site Hveem test. Stability shall be 35-40 percent by Hveem test.
- E. Thickness of Topping After Compaction - 1-1/2 inches, unless shown otherwise. Adjust

as required to obtain grade for drainage.

3.3 Field Quality Control

A. Surface: Smooth, hard and well cemented to base course.

B. Grades: Conform to those shown.

C. Accuracy: Free of puddles deeper than 1/2 inch where designed for a slope of at least 1/4 inch per foot.

END OF SECTION

SECTION 32 13 13

CONCRETE PAVING

GENERAL

1.1 All new paving shall be concrete designed per "AASHTO Guide for Design of Pavement Structures" utilizing "Low-Volume Road Design".

1.2 Require a warranty for the work against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials or workmanship

1.3 Concrete paving, including, but not limited to parking lots, aprons, sidewalks, curbs, handicapped accessible ramps, approaches, and miscellaneous exterior concrete

1.4 Require broom finish on exterior sidewalks

1.5 Include a minimum of 5-foot wide paved access to and around the flagpole, accessible by the handicapped.

1.6 Exterior walk and paving joints shall have pourable grade two-part polysulfide or urethane sealant. Require prepared joint to be wire brushed and air blasted to thoroughly clean joint before installing sealant.

1.7 Concrete shall slope at 1% minimum unless approved by SAISD program manager

1.8 Standard parking spaces shall be 9' X 20'. Use compact parking spaces (8' X 16') only if recommended by a traffic impact study.

1.9 Drive isles shall be 24' minimum wide for car traffic and 30' wide minimum for bus traffic.

PRODUCTS

2.1 Metal Reinforcement:
- A. Bars: Conform to ACI 315, latest edition. Comply with ASTM A615, Grade 60, deformed billet steel bars, unfinished, except Number 3 bars shall comply with ASTM A615, Grade 40, deformed billet steel bars, unfinished.

2.2 Tie Wire: 16 gauge annealed.

2.3 Concrete Materials (Other than concrete for extruded curbs, unless noted otherwise)
- A. Cement: Type 1, ASTM C150, unless approved otherwise by Architect. Use one brand of cement for entire project.
- B. Concrete Admixtures: Provide admixtures produced and serviced by established, reputable manufacturer and used in compliance with manufacturer's recommendations.
- C. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.
- D. Water-Reducing Admixture: ASTM C494, Type A, and containing not more than 0.05 percent chloride ions.
- E. High-Range Water-Reducing Admixture (Superplasticizer): ASTM C494, Type F or Type G and containing not more than 0.05 percent chloride ions.
- F. Do not allow Calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions.
- G. Integral Color Pigment (Required for new concrete handicapped accessibility

ramps): Mineral oxide, lightfast, lime-proof, water-resistant type conforming to ASTM C979. Color(s) shall be as selected by Architect from manufacturer's standard color line.

H. Aggregates: Comply with ASTM C33 with Maximum size not larger than 1/5 of narrowest dimension between forms of the member for which concrete is to be used. Not larger than 3/4 of minimum clear spacing between reinforcing bars. 1-1/2 inch maximum in paving slabs.

I. Strengths: Five sack (shall contain no less than 5 sacks of Portland cement)/3,500 psi/28 days. Strength recommendations on Drawings supersede when they are greater than specified

J. Water - Cement Ratio (lb water per lb of Portland cement):3,500 psi concrete:
   1. 0.58 maximum
   2. 0.46 maximum for air-entrainment

K. Slump shall be 4 inches plus or minus 1 inch, unless specifically noted otherwise.

L. Expansion Joints: Fiber Joint Filler/Expansion Joints: Premolded asphalt impregnated rigid fiber board. Comply with AASHTO M-213. Use 3/4 inch thick at expansion joints adjacent to extruded curbs, 1/2 inch thick at perimeter of footings for ground-set items such as bollards and fence posts where such footings are incorporated into slabs; elsewhere as shown.

M. Wood Joint Filler/Expansion Joints: Where indicated in the drawing, provide construction clear heart grade redwood joints conforming to AASHTO M-90. Provide sizes indicated on drawings. Do not install adjacent to curbs

N. Load Transfer Units:
   1. Light Duty (sidewalk): 3/4 inch thick construction clear heart redwood expansion joint form with minimum one inch deep removable top strip, 1/2 inch by 10 inch smooth steel reinforcing bars at 12 inches o.c. with bond breaker sleeve on one side, and 3/32 inch thick steel bar-support plates each side. Provide custom size as required for full depth of paving and sealant depth as required by sealant manufacturer.
   2. Medium Duty (Auto) / Heavy Duty (truck/bus traffic): 3/4 inch thick redwood expansion joint form with minimum one inch deep removable top strip, 3/4 inch by 18 inch steel reinforcing bars at 12 inches o.c. with bond-breaker sleeve on one side and 3/16 inch steel bar-support plates each side. Provide custom size as required for full depth of paving and sealant depth as required by sealant manufacturer.

O. Transverse/Longitudinal Construction Joints: 18 gauge preformed galvanized keyway with removable strip.

P. Chairs and Spacers: Heavy-duty plastic-type sized to support all reinforcing steel to proper height directly on properly prepared and compacted subgrade. No sand cushion pads will be permitted. Provide chairs and spacers Series "B" by W.H.C. Products, Inc., E-Z Chair by Aztec Concrete Accessories, Inc., MEDCO PC-4 by Meadow Burke, a Division of MMI Products, GTI Bar Chair by General Technologies, Inc., or approved equivalent. Maximum spacing of chairs shall be 36-inches on center each way.

Q. Epoxy Adhesive: ASTM C881, two component, 100 percent solids, 100 percent reactive compound suitable for use on dry or damp surfaces.

R. Curing Compound: The compound shall conform to ASTM C309-1315, Type II (A.I.M. Regulations - VOC Compliant).

EXECUTION

3.1 The architect should include the following requirements in their specification and include additional directives as necessary for the project.

3.2 Coverage of Reinforcement: The metal reinforcement shall be protected by the thickness of concrete indicated on the plans.

A. Three inches: Concrete deposited against ground without use of forms.

B. Two inches: Bars more than 5/8 inch diameter where concrete is exposed to the

weather, or exposed to the ground but placed in forms.

C. 1-1/2 inches: Bars 5/8 inch diameter where concrete is exposed to the weather, or exposed to the ground but placed in forms.
D. Two inches: In slabs and walks on grade.
E. 1-1/2 inches-1-3/4 inches from top for paving

3.3 Concrete Placement, General:

A. Place concrete in compliance with practices and recommendations of ACI 304, and as specified herein.
B. Do not deposit concrete on concrete which has hardened sufficiently to form seams or planes of weakness within the section.
C. Sections between expansion joints and construction joints shall be placed in continuous pours; construction joints in paving and walks other than at formed joint locations will not be permitted.
D. Place concrete at such a rate that concrete which is being integrated with fresh concrete is still plastic.
E. Deposit concrete as nearly as practicable in its final location to avoid segregation due to rehandling and flowing. Do not subject concrete to any procedure which might cause segregation.
F. Screed concrete which is to receive other construction to the proper level to avoid excessive skimming and grouting.
G. Do not use concrete which becomes nonplastic and unworkable, or does not meet the required quality control limits, or which has been contaminated by foreign materials.

3.4 Slab Placement:

A. Moisten subgrade the evening before and immediately prior to placement of all paving slabs.
B. Deposit and consolidate concrete slabs in a continuous operation, within the limits of all expansion joints, until the placing of a panel or section is completed using vibrating bridge screeds, roller pipe screeds or other methods acceptable to Architect.
C. Consolidate concrete during placement by use of the specified equipment, preferably with power driven floats of impact type, thoroughly working concrete around reinforcement and into corners.
D. Bring slab surfaces to correct level with a straight edge, and then strike off.
E. Use bullfloats or darbies to smooth the surface, leaving it free from bumps and hollows.
F. Do not sprinkle water on the plastic surface; do not disturb the slab surfaces prior to start of finishing operations.

END OF SECTION

SECTION 32 18 00

ATHLETIC AND RECREATIONAL SURFACING

GENERAL

1.1 Verify the areas of all new synthetic turf surface and shock absorbing pad designed for athletic and recreational use. The Consultant shall design a facility to ensure that the Synthetic Field Sport Surfacing Contractor will furnish all materials, labor, supervision and equipment necessary for the accurate completion of the synthetic turf installation and all project-specific work indicated on the plans and specifications.

1.2 The synthetic field surface requirements within these guidelines are considered minimum acceptable standards for installation of a synthetic athletic field and does not obviate the design team's responsibility to perform their due diligence to conform to best industry practices. If a deviation is required then the Consultant shall obtain written approval from assigned SAISD Project Manager.

1.3 Careful consideration should be given to existing soils conditions and necessary substrate drainage requirements. All surface and subsurface drainage shall comply with City of San Antonio impervious site drainage requirements.

1.4 A geotechnical report will be required to evaluate subsurface conditions at the site and develop geotechnical engineering recommendations and guidelines relative to potential soil movements and mitigation for the proposed design. Recommendations shall include (but not limited to the following): site excavation, fill compaction, and the use of on-site and imported fill material, including recommended base materials, aggregate thickness, and compaction under the athletic fields.

1.5 Engage a State of Texas Licensed Land Surveyor to properly layout the field; verify dimensions and locate design elements, including inlaid markings and inserts; verify elevations of base materials and verify that finish grades are in compliance with the requirements of the project and the synthetic grass surfacing manufacturer.

1.6 Design Professional to provide a field marking and dimensioning plan which includes field lines, boundaries, numbers, hashes, ticks, logos and other field markings in compliance by the regulatory sports agency and the drawings. Final Shop drawings that include approved field marking and dimensioning plan shall be submitted to the Engineer and Owner (SAISD Athletics) for final approval prior to the manufacturing and shipment of materials.

~~**PRODUCTS**~~

~~2.1 Synthetic Grass~~

~~A. Design team shall detail out section including stabilized sub grade, 20 w/PJC liner, Sub drains, 8" free drainage stone base~~

~~B. Provide Monofilament at the stadiums- Rubber/ Sand in filled minimum 45 oz, 2.5" pile height monofilament fiber turf~~

~~C. Provide Slit film at the high schools- Rubber/ Sand in filled~~

PRODUCTS

2.1 Synthetic Grass

A. Dual Fiber System to include the following:

1. Dual Fiber System is a hybrid monofilament and slit film turf with SBR rubber with sand blend infill. The turf fabric shall be filled with an infill material layered system of rounded silica sand and processed SBR rubber at a mixture rate that meets the manufacturer's system requirements.
2. Shock Pad: Shall be a panelized system and shall meet all HEAD INJURY CRITERIA (HIC) requirements measured at 1.2 meters. **E-layer will not be accepted.**
3. Synthetic Turf Rolls shall be a minimum of 15' feet wide. Rolls shall be of sufficient length (1' min. Overage) to cover from sideline to sideline without head seams.
4. All components and their installation method shall be designed and manufactured for use on outdoor athletic fields. The materials as hereinafter specified, should be able to withstand full climatic exposure in all climates, be resistant to insect infestation, rot, fungus and mildew; to ultra-violet light and heat degradation, and shall have the basic characteristic of flow through- drainage allowing free movement of surface run-off through the turf fabric where such water may flow to the existing sub-base and into the field drainage system.
5. The finished playing surface shall appear as mowed grass with no irregularities and shall afford excellent traction for conventional athletic shoes of all types. The finished surface shall resist abrasion and cutting from normal use. The installed system shall be suitable for baseball, softball, PE classes, intramurals and recreational use.
6. Pile yarn (Polyethylene) shall be proven athletic caliber yarn designed specifically for outdoor use and stabilized to resist the effect of ultraviolet degradation, heat, foot traffic, water and airborne pollutants.

2.2 Field Marking Layout

A. Furnish all labor, materials, tools and equipment necessary to install, in place, all synthetic Turf material with field markings and logos, inlaid lines and numbers as indicated on the plans and as specified herein. The installation of all new materials shall be performed in strict accordance with the manufacturer's written installation instruction, and in accordance with all approved shop drawings

2.3 Resilient Infill Materials

A. Resilient infill materials shall be uniformly filled to a depth which meets the system specification after settlement and consist of a homogeneous mixture meeting the following criteria.

Infill systems shall be comprised of ground rubber and mixed silica sand. The infill material fills the voids between the fibers allowing the fibers to remain vertical and non-directional.

1. The infill materials are to be approved by the manufacturer, and shall be inserted

according to the manufacturer's approved procedures by qualified installers.

2. Precisely blend the infill materials to obtain a homogeneous mix (as required).
3. Install and compact the infill materials so that the infill is settled and will meet the system specifications throughout the warrantee.

2.4 Miscellaneous Materials

B. Seaming Tape: Tape for securing inlaid lines and reference tick marks in the tufted synthetic turf surfaces shall be high quality seam tape made especially for artificial turf applications with a minimum width of 15" inches

C. Adhesives: Adhesives for bonding tufted artificial turf shall be hot melt or a one-part moisture cured polyurethane obtained from a single manufacturer and be equivalent to Nordot 34-G as manufactured by Synthetic Surfaces, Scotch Plains, NJ (908) 233-6803 or approved equal. The adhesive shall be amended per the manufacturer specification during adverse weather conditions.

D. Turf Attachment Nailer: The turf attachment nailer shall be a recycled plastic lumber (composite) material made in units to match nominal lumber. The method for attaching to the turf attachment curb of the synthetic turd shall be hidden, stable, non-degradable, and not visible when construction is complete as recommended by the Synthetic Turf Provider. All edge conditions must be addressed, including where the synthetic turf abuts skinned infield, paved areas, or concrete conditions.

2.5 Substitutions

A. No substitutions will be allowed after the bid date. Bidding contractor must identify system with bid package. If a non-specified product is identified, the proposed alternate product must be submitted and preapproved (in writing) by SAISD Project Manager. If bidding contractor does not identify a manufacturer, the Owner will assume that the specified product is included in the bid package and will not consider substitutions. No product substitutions will be accepted after award.

2.6 Environmental Considerations

A. Product must not contain concentrations of metals, volatile organic compounds (VOCs), or semi-volatile organic compounds (SVOCs) at concentrations greater than EPA Regional Screening Levels or Department of Toxic Substances Control Human Health Risk Assessment (HHRA) Note 3 thresholds. (EPA 60108, EPA 7470A EPA 7471A, EPA 8260B, EPA 8270C).

B. Product must not contain leachable concentrations of metals, VOCs, or SVOCs (using the synthetic precipitation leaching procedure) greater than maximum contaminant levels (MCLs) or Regional Water Quality Control Board Environmental Screening Levels for groundwater and surface water - fresh water aquatic habitat. (EPA 60108, EPA 7470A EPA 7471A, EPA 8260B, EPA 8270C).

2.7 Site Preparation - to be determined by Geotechnical Report and Design criteria for each project.

2.8 Bonding of Material Surfaces

B. The adhesive bonding of all system material components shall provide a permanent, tight, and secure and hazard free athletic playing surface. The following components, at a minimum, shall meet this requirement. Bonding of:

1. Turf to seam tape (if tape is used)
2. All turf to terminal edges

C. The bonding design and work shall be such that all surface joint and seams shall remain as required throughout the warranty period as a minimum.

3.2 Seam Construction

A. Edges and seams are to be constructed in strict accordance with manufacturer's instructions.

B. The synthetic turf surface shall be installed using sewing or glue/hot melt techniques for the main seams and glue or hot melt for the inlays. All sewn seams shall be done with high strength durable outdoor cord routinely used for synthetic turf surfaces and Union Special sewing machines or equivalent. Seams shall be indiscernible at the completion of the installation. Shearing of fiber or yarn to achieve a uniform system height must be approved by the owner's representative.

C. All seams widths are to be the absolute minimum and as approved. All seams (butt joints) shall be traverse to the field direction of play. No head seams are allowed on the playing surface. All lateral seams (if sewn) are to be sewn with a reinforced lock stitch.

D. Seams shall be sown or glued so that the exposed primary backing does not exceed ¾" maximum.

E. Remove fibers from the stitch line prior to sewing the carpet panels.

3.3 Field Markings

A. Field marking, lines and logos shall be as approved by owner prior to fabrication and installation. The Owner reserves the right to reject any turf panels not properly tufted in accordance with the seaming plan. Markings for the sports fields shall be approved via shop drawings. Contractor shall coordinate with the Owner, on the logos, colors of the logos and line marking during the shop drawing submittal and approval process.

B. Field of play perimeter lines and field lines shall be tufted into the turf carpet as shown on the plans. Numbers logos and hash markings are to be inlaid prior to insertion of the infill.

C. All synthetic turf carpet used for field marking must be the same yarn, type and height.

D. Under no circumstances will inlays or repairs of less than 4 inches in width be allowed.

2.2 Field Surfacing

A. Warning tracks- 4" red dog cinder or app'd equivalent

B. Bull pens- Pitching area to be mound clay; bull pen to be 5" concrete pad w/ knitted nylon synthetic turf over a 5mm pad glued to concrete, Astroturf system 5 or approved equal

2.3 Natural grass type and root zone- Tif 419.6" root zone being 91% sand and 10% silt/clay

2.4 Running tracks

A. Surfacing shall be a minimum of 10mm full pour

B. High school and competition tracks shall be 8 lane 400 meter per IAAF at high schools. Basis of design for High School tracks is Beynon Sports BSS 1000.

C. Coordinate the design of middle school tracks with the SAISD Project Manager. Basis of design for Middle School tracks is Beynon Sports BSS 300.

2.5 For outdoor concrete basketball courts incorporate an integral coloring to reduce reflectivity

2.6 Tennis court

A. Post tensioned concrete with tennis court surfacing- Tennis courts surface and coating shall be plexipave, laycold or approved equivalent

EXECUTION

3.1 The architect should include the following requirements in their specification and include additional directives as necessary for the project.

~~3.2 Require that synthetic turf system is installed in the field by crews employed by the turf supplier and under the direction and supervision of the manufacturer.~~

~~3.3 Require that synthetic turf system adhered to a special reinforcing tape as recommended by the manufacturer. No cross or head seams will be permitted.~~

~~3.4 Require that synthetic turf system is installed in accordance with manufacturer's instructions.~~

3.5 No installation shall be attempted at temperatures below 50 degrees F or under wet conditions.

~~3.6 Decorations and Field Markings: All decorations and field markings shall be inlaid~~.

END OF SECTION

SECTION 32 18 16

PLAYGROUND SURFACING

GENERAL

1.1 Protective surfacing system shall be poured-in-place and trowelled to provide for a resilient, seamless rubber surface installed over the specified base. The surfacing provider shall be responsible for all labor, materials, tools, equipment, and fees to perform all work and services for the installation of the surface. The surface shall be stable and slip resistant to comply with requirements set forth in the Texas Accessibility Standards (TAS). Additionally, the surfacing system shall exceed the minimum requirements of the ASTM f 1487 for impact attenuation Gmax and Head Injury Criteria (HIC)

1.2 Require a warranty for the work against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials or workmanship

PRODUCTS

2.1 Surfacing System: unitary poured-in-place protective surfacing system.

2.2 Surfacing Material: Synthetic (protective) surfacing includes the following: A poured-in-place system. The synthetic surfacing consists of either impact attenuating substrate covered by a wear surface bonded to produce a unified system. Submit chemical composition, color granule percentage, and test results to which material has been subjected, identifying each material and component containing recycled materials.

Synthetic surfacing systems shall exceed the minimum impact attenuating performance requirements installed in the use zones, as follows. The surfacing critical height value must yield up to both a maximum 100 G's peak deceleration, and a maximum 700 Head Injury Criteria (HIC) value for a head-first fall from the play event. The test methodology shall be in accordance with ASTM F1292 and associated standard references within the ASTM F1292 document.

2.3 Components:

A. Subbased: The subbase for synthetic surfacing shall be concrete material.

B. Concrete Subbase: Provide concrete material conforming to Section 03 33 00 ARCHITECTURAL CONCRETE and manufacturers requirements.

C. Impact Attenuating Substrate: Provide a substrate compatible with the wear surface

D. Poured-In-Place Substrate: Poured-in-place substrate must consist of a recycled, shredded, styrene butadiene rubber (SBR) adhered with a binder to form a resilient, porous material or shredded rubber. Follow manufacturer's requirements for proportions and procedures for site mixing of materials. Foam rubber will not be accepted in the substrate.

E. Wear Surface: Wear surfaces consist of the following: a poured-in-place durable, weather-resistant, ultraviolet stable, water permeable material top-coat. The wear surface must meet requirements of ASTM D2047 for a minimum 0.8 coefficient of friction.

Follow manufacturer's requirements for proportions and procedures for site mixing of materials. Poured-in-place wear surface consists of ethylene propylene diene monomer (EPDM) particles adhered with a binder formulated to produce an even, uniform surface. Particles of EPDM must meet ASTM D412 for tensile strength and elongation and be in accordance with the manufacturer's requirements

F. Adhesive: Provide a two-component polyurethane adhesive as recommended by the manufacturer.

G. Transition Edge: The transition edge must be designed to maintain the protective surfacing performance, support the surfacing between changes of material, and must be concrete in accordance with paragraph CONCRETE CURB. The face of the edge to the subgrade must be covered with the impact attenuating surface and meet the requirements of paragraph ALLOWABLE G-MAX AND HIC RANGES

EXECUTION

3.1 SITE PREPARATION

Prior to installing the protective surfacing, verify the playground equipment are installed in accordance with Section 11 68 13 PLAYGROUND EQUIPMENT.

3.1.1 Finished Grade and Underground Utilities Submit finished grade, underground utilities, storm-drainage system, and irrigation system status; and location of underground utilities and facilities. Verify that finished grades are as indicated; the smooth grading has been completed. The location of underground utilities and facilities in the operation must be verified. Do NOT proceed with the installation if underground natural gas lines or underground power lines are within the footprint of the proposed playground area.

3.1.2 Layout: The layout of the entire use zone perimeter must be staked before excavation begins. The location of all elements must be staked to include the following: All play event configuration access and egress points; and use zone perimeters. Use zone perimeters must not overlap hard surfaces. The use zone perimeter must meet or exceed the requirements of paragraph 1.3.1. Use zone perimeters must not overlap except for certain play events as defined in ASTM F1487.

3.1.3 Obstructions Below Ground:When obstructions below ground affect the work, shop drawings showing proposed adjustments must be provided.

3.1.4 Substitution: Under no circumstances are substitutions to be allowed or protective surfacing to be selected without written approval from the District's Project Manager.

END OF SECTION

SECTION 32 31 13

CHAINLINK FENCE AND GATES

GENERAL

1.1 Provide chain link fabric shall have the PVC thermally fused to the galvanized steel core wire. Extruded or bonded and glued chain link fence fabric will not be accepted

1.2 Fence framework shall have the PVC thermally fused in compliance with ASTM F1234

1.3 Provide 8'-0" gate to all open grassed areas to allow for mower access.

1.4 Provide 12-0" double gate as required to access the transformer.

1.5 Use an ornamental fence at the front of the site.

PRODUCTS

2.1 Fence Fabric:

A. PVC coating thermally fused to zinc-coated or zinc-5 percent aluminum-mischmetal alloy- coated steel core wire: ASTM F668 Class 2b, 7 mil thickness thermally fused. Core wire tensile strength 75,000 psi.

B. Size: Helically wound and woven to height of six feet with two inch diamond mesh, with core wire diameter of 0.148 inch (9 gauge) and a breakload of 1290 lbf. Color shall be black and comply with ASTM F934

C. Selvage of fabric shall be knuckled at top and knuckled at bottom.

2.2 Fence Framing:

A. Steel pipe - Type I: ASTM F1083, standard weight schedule 40; minimum yield strength of 25,000 psi; sizes as indicated below. Hot-dipped galvanized with minimum average 2.0 oz/ft² of coated surface area.

1. Line posts: 1.90 inch o.d. up to 6 feet on center; 2.375 inch o.d. up to 10 feet on center.
2. Terminal, End, Corner, and Pull posts: 1.0 inch o.d. up to 6 feet on center; 2.975 inch o.d. up to 10 feet on center
3. Rails and Braces: 1.660 inch o.d.
4. PVC finish: In accordance with ASTM F1043, apply supplemental color coating of 10 to 15 mils thermally fused PVC in color to match fabric.

2.3 Gate frames: Fabricate chain link swing gates in accordance with ASTM F900 using galvanized steel tubular members, 2 inches square, weighing 2.60 lb/ft. Fusion or stainless steel welded connections forming rigid one-piece unit. Vinyl coated frames thermally fused with 10 to 15 mils of PVC in accordance with ASTM 1043. PVC color to match fence.

A. Chain link fence fabric: PVC thermally fused to metallic coated steel wire, ASTM F668, Class 2b, in color, mesh, and gauge to match fence. Install fabric with hook bolts and tension bars at all four sides. Attach to gate frame at not more than 15 inches on center.

B. Hardware materials: Hot dipped galvanized steel or malleable iron shapes to suit gate size. Field coat moveable parts (i.e. hinges, latch, keeper, and drop bar) with PVC touch up paint, provided by manufacturer, to match adjacent finishes.

C. Hinges: Structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off type hinge design shall permit gate to swing 180 degrees inward.

D. Latch: Forked type capable of retaining gate in closed position and have provision for padlock. Latch shall permit operation from either side of gate.

E. Keeper: Provide keeper for each gate leaf over five feet wide. Gate keeper shall consist of mechanical device for securing free end of gate when in full open position.

F. Double gates: Provide drop rod to hold inactive leaf. Provide gate stop pipe to engage center drop rod. Provide locking device and padlock eyes as an integral part of latch, requiring one padlock for locking both gate leaves.

G. Gate posts: Steel pipe, ASTM F1083, standard weight schedule 40; minimum yield strength of 25,000 psi, 2.875 inches in diameter. Hot-dipped galvanized with minimum 1.8 oz/ft² of zinc or respective material finished in accordance with ASTM F1043. PVC color to match fence.

EXECUTION

3.1 Require installation of chain link fence in accordance with ASTM F567 and manufacturer's instructions.

3.2 Locate terminal post at each fence termination and change in horizontal or vertical direction of 30 degrees or more.

3.3 Space line posts uniformly at 10 feet on center.

3.4 Concrete fence post footings shall be set in 3000 psi concrete at 28 days:

A. Drill holes in firm, undisturbed or compacted soil. Excavate deeper than specified below as required for adequate support in soft and loose soils, and for posts with heavy lateral loads.

B. Line posts shall be set in 9 inch minimum diameter concrete piers, with a minimum of 33 inches of post embedment in concrete with an additional 3 inch concrete cover at bottom.

C. All end, corner, and pull posts shall be set in minimum 12 inch minimum diameter concrete piers, with a minimum of 33 inches of post embedment in concrete with an additional 3 inch concrete cover at bottom.

D. Place concrete around posts in a continuous pour.

E. Trowel finish around post. Slope to direct water away from posts.

3.5 Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

3.6 Bracing: Install horizontal pipe brace at mid-height for fences six (6) and over, on each side of terminal posts. Firmly attach with fittings. Install diagonal truss rods at these points. Adjust truss rod, ensuring posts remain plumb.

3.7 Tension wire: Provide tension wire at bottom of fabric. Install tension wire before stretching fabric and attach to each post with ties. Secure tension wire to fabric with 12-1/2 gauge hog rings 24 inches on center.

3.8 Top rail: Install lengths, 21 feet. Connect joints with sleeves for rigid connections for expansion/contraction.

3.9 Install gate posts in accordance with manufacturer's instructions.

A. Drill holes in firm, undisturbed or compacted soil. Excavate deeper than specified below as required for adequate support in soft and loose soils, and for posts with heavy lateral loads.

B. All gate posts shall be set in minimum 12 inch minimum diameter concrete piers, with a minimum of 33 inches of post embedment in concrete with an additional 3 inch concrete cover at bottom.

C. Place concrete around posts in a continuous pour.

D. Trowel finish around post. Slope to direct water away from posts.

E. Gate posts and hardware: Set keeper, stops, sleeves into concrete. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

END OF SECTION

SECTION 32 31 19

ORNAMENTAL FENCE AND GATES

GENERAL

1.1 The architect should include in this section: Ornamental picket fencing, gates and accessories, including related footings for posts.

1.2 Require a warranty for 15 years against becoming unserviceable or causing an objectionable appearance resulting from either defective or non-conforming materials and workmanship. Defects shall include, but not limited to, the following: cracking, peeling, blistering, corroding or failure of mechanical parts or assemblies.

PRODUCTS

2.1 Where products are named in the design guidelines, they are considered the basis of design. Other approved manufacturers must have a minimum of five years experience manufacturing products meeting or exceeding the guidelines to be considered.

A. Specifications for fence are based on “Estate N” and for double gates are based on “Estate A-1” manufactured by Monumental Iron Works/Master Halco Inc.

B. Field fabrication of ornamental fences and gates meeting the specified requirements is acceptable.

2.2 ORNAMENTAL PICKET FENCE

A. Pickets: Galvanized square steel tubular members manufactured in accordance with ASTM A787, having a 45,000 psi yield strength and G90 zinc coating, 0.90 oz/ft^2. Size pickets 3/4 inch by minimum wall thickness 18 gauge. Space pickets 3-15/16 inch maximum face to face. Attach each picket to each rail with 1/4 inch #4 industrial drive rivets.

B. Rails: 1-1/2 inch x 1-3/8 inch x 1-1/2 inch, 11 gauge thick galvanized steel “U” channel in accordance with ASTM A653 or ASTM A1008, having a 50,000 psi yield strength and G90 zinc coating, 0.90 oz/fl^2. Punch rails to receive pickets and rivets and attach rails to rail brackets with two each, 1/4 inch #4 industrial drive rivets. Steel for rail produced under ASTM A653.

C. Posts: Galvanized square steel tubular members manufactured in accordance with ASTM A787 having 45,000 psi yield strength and G90 zinc coating, 0.90 oz/fl^2). Zinc coating is inside and outside. Posts which are zinc coated outside and painted inside, are unacceptable. Minimum post size three inches, having 12 gauge wall thickness, weighing 4.286 lb./ft.

D. Accessories: Assembled panels with ornamental accessories attached using industrial drive rivets to prevent removal and vandalism.

E. Finish: All pickets, channels, posts, fittings and accessories shall be polyester coated individually after drilling and layout, to ensure maximum corrosion protection. All components are given a four stage “Power Wash” pre-treatment process that cleans and prepares the galvanized surface to assure complete adhesion of the finish coat. All metal is then given a polyester resin based power coating applied by the electrostatic spray process, to a thickness 2.5 mils. The finish is then baked in a 450 degrees F (metal temperature) oven for 20 minutes.

2.3 ORNAMENTAL PICKET SWING GATES

A. Gate Frames: Fabricate ornamental picket swing gate using galvanized steel members, ASTM A283, structural quality steel, 45,000 psi tensile strength, with galvanized G90 coating. Frame members welded using stainless steel welded to form rigid one-piece unit. (no substitution) Minimum size vertical uprights, two inches square 13 gauge wall thickness.

B. Ornamental Picket Infill: "U" channel rails, formed from hot rolled, structural steel, 1-3/8 inch wide x 1-1/2 inches deep, 11 gauge wall thickness. Punch rails to receive pickets, and weld inside gate frame. Pickets, galvanized steel, 3/4 inch square tube of gauge, spacing, and with accessories to match fence. Attach pickets to "U" rails by 1/4 inch industrial drive rivets, size #4.

C. Bracing: Provide diagonal adjustable length truss rods on gates to prevent sag.

D. Hardware Materials: Galvanized steel or malleable iron shapes to suit gate size.

E. Hinges: Structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off type hinge design shall permit gate to swing 180 degrees.

F. Latch: Capable of retaining gate in closed position and have provision for padlock.

G. Keeper: Provide keeper for each gate leaf over 5 feet wide. Gate keeper shall consist of mechanical device for securing free end of gate when in full open position.

H. Double Gates: Provide drop rod to hold inactive leaf. Provide gate stop pipe to engage center drop rod. Provide locking device and padlock eyes as an integral part of latch, requiring one padlock for locking both gate leaves.

I. Gate Posts: Square members, ASTM A787, structural quality steel 45,000 psi tensile strength, with galvanized G90 coating; size as indicated below:

Gate Leaf Single Width	Post Size (square)	Post Depth
3 ft to 4 ft	3 inches	36 inches
4 ft to 8 ft	4 inches	42 inches
12 ft. to 18 ft.	6 inches	48 inches

J. Polyester Powder Coat Finish: After components have been galvanized to provide maximum corrosion resistance, pre-treat, clean, and prepare galvanized surface to assure complete adhesion of finish coat. Apply 2.5 mil thickness of polyester resin based powder coating by electrostatic spray process. Bake finish for 20 minutes at 450 degrees F, metal temperature. Color shall match ornamental picket fence.

2.4 ACCESSORIES

A. Rail Attachment Brackets - Die cast of zinc (ZAMAK #3 Alloy) in accordance with ASTM B86-83Z 33521. Ball and socket design capable of 30° swivel (up/down-left/right). Bracket to fully encapsulate rail end for complete security. (no substitution)

B. Industrial Drive Rivets: Of sufficient length to attach items in a secure non-rattling position. Rivet to have a minimum of 1100 lbs. holding power and a shear strength of 1500 lbs.

C. Ornamental Picket Fence Accessories: Provide indicated items required to complete fence system. Galvanize each ferrous metal item in accordance with ASTM B695 and finish to match framing.

D. Post Caps: Formed steel, cast of malleable iron or aluminum alloy, weathertight closure cap. Provide one ball style post cap for each post.

E. Rings: Cast aluminum. Attach ring to top rail by inserting mounting blocks into top rail and riveting through side of rail using 1/4 inch industrial drive rivet. Hold bottom of ring in place by dowel that protrudes from ring through pre-drilled hole in bottom rail.

F. Picket Tops: Flat tops extending above rail.

2.5 SETTING MATERIAL

A. Concrete: Minimum 28 day compressive strength of 3000 psi.

B. Flanged Posts: Provide flange type base plates with 4 holes for surface mounting of posts where indicated.

EXECUTION

3.1 Verify areas to receive fencing are completed to final grades and elevations. Ensure property lines and legal boundaries of work are clearly established.

3.2 FENCE INSTALLATION

A. Fence height shall be ~~8~~ 6 feet-0 inches high, unless indicated otherwise.

B. Install fence in accordance with manufacturer's instructions.

C. Space posts uniformly at 7 feet-8-3/4 inches maximum face to face, unless otherwise indicated.

D. Concrete Set Posts: Drill hole in firm undisturbed or compacted soil. Holes shall have diameter four times greater than nominal outside dimension of post, and depths approximately 6 inches deeper than post bottom. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom below surface when in firm, undisturbed soil to depth as indicated in table above. Place concrete around post in a continuous pour. Trowel finish around posts and slope to direct water away from posts.

1. Gate Posts and Hardware: Set keepers, stops, sleeves and other accessories into concrete. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

E. Surface mount (wall mount) posts with mounting plates where indicated. Fasten with lag bolts and shields.

F. Check each post for vertical and top alignment, and maintain in position during placement and finishing operation.

G. Align fence panels between posts. Firmly attach rail brackets to posts with 1/4" (6 mm) bolt and lock nut, ensuring panels and posts remain plumb.

3.3 ORNAMENTAL PICKET GATE FRAMING INSTALLATION

A. Install gate posts in accordance with manufacturer's instructions.

B. Concrete Set Gate Posts: Drill holes in firm, undisturbed or compacted soil. Holes shall have diameter four times greater than outside dimension of post, and depths approximately 6 inches deeper than post bottom. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom 36 inches below surface when in firm, undisturbed soil. Place concrete around posts in a continuous pour. Trowel finish around post and slope to direct water away from posts.

1. Gate Posts and Hardware: Set keepers, stops, sleeves into concrete. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

3.4 GATE INSTALLATION

A. Gate height shall be as indicated on drawings.

B. Install gates plumb, level, and secure for full opening without interference.

C. Attach hardware by means which will prevent unauthorized removal.

D. Adjust hardware for smooth operation.

3.5 Install post caps and other accessories to complete fence.

3.6 CLEANING AND ADJUSTING

A. Clean up debris and unused material, and remove from site.

B. Post hole excavation material shall be scattered uniformly away from the posts or removed as directed by Architect.

C. Concrete splatter shall be cleaned from exposed surfaces of posts.

D. Adjust gates for level, smooth, quite operation.

END OF SECTION

SECTION 32 84 00

SITE IRRIGATION

GENERAL

1.1 SUMMARY

A. This Section includes:

1. Landscape irrigation systems.
2. Irrigation controllers and accessories.

1.2 Consider installing the following components for optimal water efficiency:

A. Check valves in all sprinklers to retain water in lateral pipes between cycles.
B. Demand based irrigation controls (i.e., weather or sensor based controls).
C. Rain, freeze, and wind sensors to interrupt irrigation during unfavorable weather conditions.
D. Flow rate monitoring equipment that can interrupt irrigation if excess flow is detected. (i.e., caused by broken pipes, fittings, nozzles, emitters sprinklers, etc.).

1.3 DEFINITIONS

A. Definitions pertaining to sustainable development: As defined in ASTM E2114 and as specified herein.
B. Controllers, Climate-based: Weather-based irrigation controls that use real-time or historical weather information along with landscape parameters entered by the vendor to schedule or allow for irrigation when plants need water.
C. Controllers – to include but not limited to built in features such as ET (evapotranspiration) which calculate the amount of water needed by combination of type of soil , grass or tree.
D. Rain Sensors: A rain shut-off device designed to interrupt a scheduled cycle of an automatic irrigation system controller (i.e. timer) when a certain amount of rainfall has occurred (i.e. Rain Bird WR2 wireless rain/freeze sensor).

PRODUCTS

2.1 Irrigation Controllers and Accessories

A. Irrigation Controller: SmartRain or approved equal.
B. Accessories: Irrigation accessories like valves, rotors, sprays, rotary nozzles and bubblers etc. can be provided by other manufactures (Rain Bird, Hunter, etc.)

2.2. Irrigation systems shall be equipped with irrigation controllers that contain the following features:

A. Multiple programming capabilities – shall be capable of storing a minimum of three different programs to allow for separate schedules.
B. Multiple start times (cycling, cycle/soak, stackable start times) – shall be capable of a minimum of three different start times to allow for multiple irrigation cycles on the same zone for areas prone to runoff.
C. Variable run times – shall be capable of varying run times, for example one minute to a minimum of one hour.
D. Variable scheduling – shall be capable of variable scheduling (minimum of 7 days) to

allow for watering on even day scheduling, odd day scheduling, and calendar day scheduling.

E. Percent adjust (water budget) feature – shall include a "Percent Up/Down Adjust" feature (or "Water Budget" feature) such as a button or dial that permits the user to increase or decrease the run-times or application rates for each zone by a prescribed percentage, by means of one adjustment without modifying the settings for that individual zone.

F. Capability to accept external soil moisture and/or rain sensors.

G. Non-volatile memory or self-charging battery circuit.

H. Complete shutoff capability for total cessation of outdoor irrigation.

EXECUTION

3.1 The architect should include the following requirements in their specification and include additional directives as necessary for the project.

3.2 Need dedicated irrigation meter for this system.

3.3 Conventional or traditional cabling system is acceptable for irrigation systems. However, 2-wire cabling system will not be allowed for irrigation system.

3.4 Include 5 years of cellular fee and annual hosting. (Contact Smart Rain for latest rates. 801-295-3339)

3.5 No drip system is allowed.

3.6 Master valve and flow sensor shall be provided (spec ultrasonic or impeller type flow sensor and normally closed master valve)

3.7 Provide Rain Bird WR2 wireless Rain/Freeze sensor or approved equal.

END OF SECTION