BIG PINE ACADEMY
GROUND FLOOR RENOVATION
BIG PINE KEY, FLORIDA

MONROE COUNTY SCHOOL DISTRICT
TECHNICAL SPECIFICATIONS

This specification book is additional to the specifications on the drawing sheets. Please reference the sheet specifications for addition required information.

DESIGN TEAM

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SECTION 01000 - DEFINITIONS AND ABBREVIATIONS

DEFINITIONS
Throughout this guide, mandated requirements are differentiated from recommendations or commentary as follows:

Mandates: Indicated by use of **"shall", "will", "use",** or **"shall not", "do not"** (in bold type)

Recommendations or commentary: Indicated by words or phrases such as "should", "may", "it is recommended" and the like. Any such words or phrases indicate an option that is to be decided by the Designer.

Any and all references to the "Owner" shall signify the Owner or designee.
ABBREVIATIONS
Owner: Monroe County School District

MCSD: Monroe County School District

Designer: Design professional registered to practice in Florida. This **shall** be an architect for the design of all-new structures, additions, and renovations or alterations to existing structures. The scope of the architect's services **shall** include the services of professional engineers to design the structural, plumbing, mechanical and electrical portion of the project. The services of the architect may be deleted and comparable services of an engineer or landscape architect may be substituted in lieu of where a project is almost entirely with the design realm of such professionals.

ADA: American's with Disabilities Act
AHERA: Asbestos Hazard Emergency Response Act of 1987
ASHRAE: American Society Heating, Refrigeration, and Air Conditioning Engineers
ASTM: American Society for Testing Materials
BOCA: Building Officials and Code Administrators International
HVAC: Heating, Ventilation and Air Conditioning
ICBO: International Conference of Building Officials
State Building Code: Florida State Building Code 2017 including the
Volumes Building, Mechanical, Plumbing, Fuel Gas and NFPA 70 NEC.
NEC: National Electric Code, 2015
NEMA: National Electrical Manufacturer's Association
NFPA: National Fire Protection Association
NRCA: National Roofing Contractors Association
OSHA: U.S. Occupational Safety and Health Administration
SBCCI: Southern Building Code Congress International
SMACNA: Sheet Metal and Air Conditioning Contractors National Association, Inc.
SREF: State Requirements for Educational Facilities 2017
UL: United Laboratories, Inc.

END OF SECTION

SECTION 01010 - CODES AND STANDARDS

- Project design and construction **shall** meet all governing codes, standards and regulations. These codes and standards **shall** supersede the MCSD Design Guidelines in event of a conflict. Among the codes and standards to be complied with are the following:

  Florida State Building Code 2017 and current updates including the Building, Mechanical, Plumbing, Fuel Gas and NFPA 70 2017 ed. NEC volumes. Florida Fire Prevention Code 2017.

  ADA Requirements

  NEMA Standards

  ASHRAE Guide (latest edition) including ASHRAE 90 and ASHRAE Standard for Energy Conservation in new buildings. UL Standards (or compatible accepted standards by NCSBC)

NFPA Guide including the following:

NFPA 10	Portable Fire Extinguishers
NFPA 13	Fire Sprinklers (where required)
NFPA 17	Range Hood Fire Extinguishing Equipment
NFPA 72	National Fire Alarm Code
NFPA 72A	Local Protection Signaling Systems
NFPA 90A	Ducts, Fire Dampers, Air Conditioning and Ventilation Systems
NFPA 91	Blower and Exhaust Systems
NFPA 96	Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment
NFPA 101	Life Safety Code

Code for Energy Conservation in new building construction as required by Florida Building Code

The School District is the Permitting Authority and with the exception of Federal and State requirements, the District is not under the jurisdiction of Town, County or City Ordinances. It is a requirement to follow local zoning and any inter local agreements with local government. The District desires to be a "good neighbor" and all local authorities will have the opportunity to review documents and be included in the planning process. The Architect will send local government planning department construction documents as a courtesy. Any requests made by these authorities will be reviewed and direction given by School District personnel.

END OF SECTION

SECTION 01020 – HAZARDOUS MATERIALS

Asbestos containing building materials **shall not** be used in the construction of the project. The contractor **will** be required to submit a signed statement that "no asbestos containing building material was used as a building material in any construction for the project, or to the best of the contractor's knowledge, was used in the building."

If any materials suspected to contain asbestos are encountered in addition or renovation work, the Owner **shall** be immediately contacted to arrange an investigation and testing of these materials. The Owner or designee **shall** supervise the removal of any asbestos containing material by an independent contractor hired.

Consider this section notice to contractors, subcontractors and short-term workers regarding asbestos containing building materials that may be present in the existing buildings. It **shall** be required that all Construction Managers, contractors and subcontractors return a completed certification form stating there is no asbestos or lead present in the existing buildings prior to beginning work.

If Asbestos is present, all abatement engineering and removal will be accomplished by separate contract. **All abatement projects require a permit issued by the District's Building Department prior to the commencement of abatement.**

The District's current asbestos management plan is available as a reference resource.

END OF SECTION

SECTION 01040 – ROOM NUMBERING & BID ALT. REQUIREMENTS

SPECIFICATIONS

- ❑ The Room Numbering **shall** be as follows:

This is the room numbering standard for Architects to use on all new projects. This standard provides unique numbers for each space and follows the guidelines for our FISH reports. This should be used as early as possible in each project to prevent two sets of numbers being used. The scheme is as follows:

A-BCDe

A = The building number. 1 should be at the front of the campus or the administration area. Circulate counter clockwise incrementing up for each new building.
B = The floor level.

- Level 5 is for custodial closets
- Level 6 is for rest rooms
- Level 7 is for adult restrooms
- Level 8 is for mechanical rooms
- Level 9 is for electrical and data rooms

C = The space type.

- 0 through 4 are for each classroom or major space. Start with 0 and go up.
- 5 is for inside circulation.

D = Increments up from one for rooms with the same first three numbers. In general start at the main entrance and circulate counter clockwise.

"e" = lower case letters a through z, starting with "a" for associated spaces like storage as defined in SREF.

Examples:
A first floor restroom in building 3 would be 3-601
The 11th classroom on the second floor of building 5 would be 5-211.
Its storage room would be 5-211a

- ❑ A letter size (8 ½ x 11) drawing of the project building and grounds will be provided as well as a building floor plan to indicate fire evacuation routes.

BID ALTERNATES

- ❑ Project bid alternates **shall** include add alternates as described in various sections of these guidelines.

ALLOWANCES

- ❑ Use of allowances is discouraged, though not prohibited.
- ❑ Filter change out/maintenance schedule to be identified by the Designer. Noncompliance by the contractor will result in actual cost back charges to their account. Reference the HVAC Section.

END OF SECTION

SECTION 01050 - WARRANTIES AND MAINTENANCE AGREEMENTS

WARRANTIES

- ❑ All work **shall** be fully warranted for one year from the date of substantial completion by the subcontractor who **shall** replace any defective materials and repair any defective workmanship. In addition, written warranties **shall** be provided for the following products and time periods. These warranties **shall** include any material and labor cost to repair defective materials and correct defective workmanship. This is not an exhaustive list. The designer should consider including any other warranties as prudent. Additional warranties should be reviewed with Owner.

3 YEAR WARRANTY

Laminate Clad Casework

5 YEAR WARRANTY

Soil Termiticide Treatment
Wood Doors
HVAC Compressors and coil coatings including Refrigeration
Paint- Workmanship, uneven fading, and product. Both contractor and paint manufacturer.
Door Locksets and panic hardware
Hollow metal doors and frames against corrosion

10 YEAR WARRANTY

Glass and Glazing Materials
Mirrors (against silvering)
Door Closers

15 YEAR WARRANTY

Insulation

50 YEAR WARRANTY

Tack boards
Marker boards

END OF SECTION

SECTION 01060 - PROJECT CLOSE-OUT

OPERATION AND MAINTENANCE MANUALS

❑ The Contractors shall deliver 3 complete sets of all operation and maintenance manuals to the Owner through the Construction Manager (CM), two (2) weeks before the pre-final inspection is held. The manuals **shall** be installed in 3 ring notebooks with the name of the project and the words "Operation and Maintenance" manuals on the cover and spine. Provide electronic PDF copies to Facility Planner, Building Official, and Director of Maintenance. The manuals **shall** contain the following items as a minimum:

- Index and page numbers.
- Complete start-up, operation, and shutdown procedures for each system including sequence of events, locations of switches, emergency procedures and any other critical items.
- Lubrication schedules and types of lubricants.
- Complete set of current shop drawings and equipment description showing all capacities and other operation conditions.
- Filter schedule, change as needed during construction and 1 complete change at time of acceptance by owner.
- Extra materials (Storage Location and Delivery/Receipt)
- Specific periodic maintenance requirements recommended by equipment manufacturers.

❑ See Section 15000 for additional requirements.

FINAL INSPECTIONS

❑ Construction Management Contractor shall schedule training for each system as indicated in this design guideline.

❑ Each project **shall** have both a pre-final and final inspection made before it is finally accepted by the Owner. A complete and thorough training **shall** be conducted by the contractors and subcontractors for the MCSD Maintenance Department after the pre-final inspection.

❑ The pre-final inspection **shall** be held after all systems are in place and in operation. All contractors **shall** demonstrate to the owner that all systems in the building are properly installed, balanced, and performing as designed and specified. All Contractors and Subcontractors **shall** attend this inspection including the HVAC air and water balance subcontractor.

❑ The final inspection **shall** be held with the Owner, Designer, all Contractors and Subcontractors to demonstrate to the Owner that all systems in the building are operating as designed and to their satisfaction.

POST INSPECTIONS

❑ Two post construction inspections may be held by the Designer with the CM and Owner to assure that the building is continuing to operate in accordance with the plans and specifications and that no unusual problems are occurring in the building systems. The first post construction inspection may be held approximately six months (at Owner's option) after substantial completion. This inspection **will** address Plumbing, HVAC and electrical work. The second post construction inspection **shall** be held prior to expiration of the 1 year general warranty period. It **shall** address general construction as well as plumbing, HVAC and electrical work. All problems discovered during these inspections that relate to defective materials or defective workmanship **shall** be corrected by the Contractor at no additional cost to the Owner.

RECORD DRAWINGS (AS-BUILTS)

❑ The Contractor **shall** specify that during construction operations the subcontractors **shall** faithfully, on a monthly basis, record all changes from the contract drawings, including accurate dimensions

where applicable including invert elevations for all below-grade outside utilities with reference to permanent above-grade objects. Compliance tied to monthly progress payment. To be reviewed at CM's discretion.

- ❑ The Contractor **shall** also specify that at completion of the work all such changes **shall** be recorded neatly with red ink by the subcontractor on an unused set of the contract drawing prints supplied by the Designer.
- ❑ The resulting Final Record Drawings **shall** be turned over to the CM in hard copy reproducible form and two (2) on CD in AutoCAD and PDF format. In addition, the CM **shall** provide the Owner with 3 half-size sets of Record Drawings.

FINAL COMPLETION

- ❑ Please refer to the General Conditions Section of the Specification**s** for a detailed listing of documentation, certification and submittals required for Final Completion and Final Payment.
- ❑ The contractor shall make a recommendation for review with the owner for all appropriate spare parts required. The subcontractors shall be required to delivery all spare parts in one transmittal for receipt by the Owner's designee.
- ❑ The contractor shall review the locations for the key box and drawing storage with the Owner.
- ❑ The subcontractor is responsible for providing the key box. Keys shall be sent to the District Building Official. A master list of keys with final room number references will be required from the manufacturer with biting schedules. The owner will tag and install keys in key lock box.
- ❑ Provide KNOX box key boxes in location determined by Fire Marshall. Each KNOX box will be supplied with master keys.

END OF SECTION

SECTION 02050 - DEMOLITION

GENERAL
ASBESTOS REMOVAL: The District will provide the most recent documentation from the Districts Asbestos Management Plan. The CM will arrange for any addition testing and asbestos removal prior to the start of demolition. **Permit from MCSD required prior to abatement activities starting**.

EXECUTION
EQUIPMENT REMOVAL: The contractor and CM **shall** schedule time for Owner to remove material and equipment to be saved. It will be the CM's responsibility to remove all loose furniture, equipment, books, supplies, etc. from the building left by the owner prior to the start of demolition. These materials shall be disposed of by the CM.

The CM shall verify that all materials considered hazardous waste are removed and disposed of in a legal and appropriate manner. This include light bulbs tubes, ballasts, materials from science labs, and other similar materials.

ENGINEERING: If the demolition subcontractor elects to use demotion equipment in or on the buildings, they will be required to provide engineered confirmation that the structure is sufficient to support the equipment being used.

END OF SECTION

SECTION 02280 - TERMITE CONTROL

GENERAL

- ❑ RE-TREATMENT AND REPAIR: If subterranean termite activity is discovered during warranty period, Contractor **will** re-treat soil and repair or replace damage caused by termite infestation, without cost to the Owner.
- ❑ The Pest Control Subcontractor **shall** pay the entire cost of re-treatment if required to comply with these specifications including the costs of providing access to the soil, repair of resulting damage to concrete, and project delays.

PRODUCTS

- ❑ SOIL TREATMENT SOLUTION: **Use** an emulsible concentrate termiticide for dilution with water, specially formulated to prevent infestation by termites. Provide a solution recommended by Applicator and acceptable to Architect and approved for intended application by the manufacturer and registered and approved by EPA. **Use** only soil treatment solutions which are not injurious to planting.

EXECUTION

- ❑ SURFACE PREPARATION: Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placement of compacted fill under slabs, if recommended by toxicant manufacturer.
- ❑ Mixing: Mix emulsible concentrate termiticide into solution on site with confirmation by the CM's testing laboratory.
- ❑ Apply according to manufacturer's recommendations as approved by the Designer. All Monroe County Schools **shall** be treated at labelled rates.
- ❑ Reapply soil treatment solution to areas disturbed by subsequent excavation or other construction activities following application.

END OF SECTION

SECTION 03300 - CAST-IN-PLACE CONCRETE

GENERAL

- ❑ CODES AND STANDARDS: Comply with applicable provisions of ACI 301 "Specifications for Structural Concrete for Buildings", ACI 318, "Building Code Requirements for Reinforced Concrete", and ACI 347, "Recommended Practice for Concrete Formwork".
- ❑ TESTING: Owner's testing laboratory will perform sampling and testing as indicated in Field Quality Control paragraph.
- ❑ FIELD QUALITY CONTROL: During placement of concrete the following tests and sampling **shall** be made:
  Sampling: ASTM C 172.
  Slump: ASTM C 143.
  Air Content: ASTM C 173.
  Compressive Strength: ASTM C 39; one specimen tested at seven (7) days, and one specimen tested at twenty-eight (28) days, and one retained for later testing if required.
  Hot Weather Concrete: ASTM 305R
- ❑ CONCRETE MIXES: Contractor **shall** employ an acceptable testing laboratory to perform materials evaluation and testing, and to design concrete mixes.
- ❑ RECYCLED MATERIALS: The use of 20% fly ash and/or 30% slag is permissible.

PRODUCTS

- ❑ CONCRETE: **Use** air-entraining admixture in all concrete, providing from 2% to 4%. Unless otherwise noted, all concrete **shall** have a twenty-eight (28) day strength of at least 3500 psi. When placed, concrete **shall** have a slump between 3 and 5 inches.
- ❑ VAPOR BARRIER: **shall** be a reinforced material such as "Moistop II" by Fortifiber Corporation. This is a 12 mil fiberglass reinforced sheeting. Or equals shall be approved by the owner. A vapor barrier is required to be in direct contact with the concrete on all slabs on grade. A vapor barrier shall also be used for all elevated buildings with the vapor barrier installed on the grade and held in place by ballast stones.
- ❑ **Use** Chemical Hardener or Surface Sealer on all interior concrete slabs to remain exposed.
- ❑ At exposed concrete floors **use** clear sealer hardener. Follow manufacturer's recommendation for surface preparation. **A**pply two (2) coats of clear sealer.

EXECUTION

- ❑ CONTROL JOINTS: Construct using pre-molded key joints, inserts, tooled joints or sawcut joints. Minimum depth of control joints **shall** be one-fourth (1/4) of the slab thickness. Maximum spacing of joints **shall** be 40 ft. by 40 ft. Isolate all slabs from exterior walls.
- ❑ REINFORCEMENT: Position support and secure reinforcement against displacement.
- ❑ PLACEMENT: Comply with ACI 318.
- ❑ CURING: **shall** begin within eight (8) hours after placing by curing and sealing compound, moisture retaining covering (curing sheets), moist curing or a combination thereof.
- ❑ SURFACE TOLERANCE: Not to exceed 1/8 in. under a 10 ft. straightedge.
- ❑ Contractor **shall** be responsible to control rinse water runoff.

END OF SECTION

SECTION 06100 - ROUGH CARPENTRY

GENERAL

- ❑ Generally speaking, there should be minimal amounts of wood permanently installed in the project.
- ❑ GRADING AND INSPECTION AGENCIES: Each piece of lumber or plywood **shall** be grade stamped by one of the following agencies:
  - APA - American Plywood Association
  - CRA - California Redwood Association
  - SPIB- Southern Forest Products Association
  - WWPA- Western Wood Products Association

PRODUCTS

- ❑ LUMBER, GENERAL: Provide seasoned lumber 19 percent moisture content. Provide preservative treated lumber for cants, nailers, blocking, furring, grounds, stripping and similar items in connection with roofing, flashing and waterproofing or in direct contact with concrete or masonry.
- ❑ BUILDING PAPER: Asphalt saturated organic felt, or polyethylene sheet.
- ❑ PRESERVATIVE TREATED WOOD: All preservative treated lumber and plywood **shall** be pressure treated with water-borne preservatives and installed with stainless fasteners or approved coated fasteners for treated wood.
- ❑ Use number 1 grade wood only unless prior approved by owner.

EXECUTION

- ❑ Store lumber and plywood materials off the ground and under cover which has been vented to prevent condensation.

END OF SECTION

SECTION 06200 - FINISH CARPENTRY

GENERAL

- ❑ GRADING AND INSPECTION AGENCIES: Each piece of lumber or plywood **shall** be grade stamped by one of the following agencies:
  - APA - American Plywood Association
  - CRA - California Redwood Association
  - SPIB- Southern Forest Products Association
  - WWPA- Western Wood Products Association
  - WMMP- Wood Molding and Millwork Producers

PRODUCTS

- ❑ LUMBER STANDARDS: Comply with PS 20 "American Softwood Lumber Standard".
- ❑ PLYWOOD STANDARDS: Comply with PS 1 "U. S. Product Standard for Construction and Industrial Plywood" for plywood and for products manufactured under PS 1, with APA PRP-108. Formaldehydes in adhesives and binders **shall not** be permitted.

EXECUTION

- ❑ Store lumber and plywood materials off the ground and under cover which has been vented to prevent condensation.
- ❑ Cope at returns and miter at corners to produce tight fitting joints. **Use** scarf joints for end-to-end joints.
- ❑ Repair damaged or defective finish carpentry where possible to eliminate functional or visual defects. Where not possible to repair, replace finish carpentry. Adjust joinery for uniform appearance

END OF SECTION

SECTION 06410 - INTERIOR ARCHITECTURAL WOODWORK

GENERAL

- ❑ It is intended that there be little if any "woodwork" in the projects. It is preferred that marine grade polymer be provided rather than wood cabinets. See Section 12304 for casework guidelines.
- ❑ STANDARDS: Comply with "Architectural Woodwork Quality Standards" published by Architectural Woodwork Institute (AWI).
- ❑ SAMPLES: Contractors should be required to submit samples of transparent finishes which show the extremes in color variation.

PRODUCTS

- ❑ CASEWORK: Casework **shall** be of a heavy-duty construction. It is suggested that Weather Strong be used as a standard for below flood applications.
- ❑ DOORS: Construction and thickness **shall** be "as required" to prevent warpage.
- ❑ SHELVES: **Do not** exceed spans of 3 ft. for 3/4 in. thick shelves and 4 ft. for 1 in. thick shelves.
- ❑ COUNTERTOP: Solid Quartz. Base material for countertops shall be plywood, except that marine grade plywood **shall** be used in wet locations or below flood applications. Plywood shall have no voids.
- ❑ CABINET HARDWARE:
  Drawer and Door Pulls: Heavy duty, 4 in. rod pull,
  Drawer Slides: 60 lb. capacity wheeled slides with self-closing feature
  Door Hinges: Concealed hinges, European Style, self-closing with built-in horizontal and vertical adjustment
  Door Silencers: **shall** be provided at all cabinet doors

EXECUTION

- ❑ PRECAUTIONS: **Do not** install architectural woodwork until the building is enclosed, the permanent heating and cooling system is in operation, and residual moisture from plaster, concrete, masonry or terrazzo has dissipated.

END OF SECTION

SECTION 08500 - METAL WINDOWS

GENERAL

- ❑ Exterior window and window-wall construction **shall** be insulating glass in aluminum frames with the exception of sidelights and transoms adjacent to entrance doors where hollow metal frames may be used. All exterior windows and glazing shall be hurricane impact rated per the requirements of the Florida Building code. Windows at classrooms and other occupied spaces **shall be fixed.** Crank or gear driven operable sash windows **shall not** be used.
- ❑ Vandal resistant systems **shall** be used.
- ❑ No projections into walkways.

PRODUCTS

- ❑ WINDOWS: **shall** be commercial grade type fabricated from aluminum extrusions of not less than 0.062 in. thickness for main frame and sash thickness. Thermal break construction **shall** be used. Single hung windows **shall** have tilt-in sash with cam latch lock. **Use** aluminum, non-magnetic stainless steel or epoxy adhesive fasteners. Frame finish **shall** be either natural satin anodized finish, color-anodized finish or fluoropolymer Kynar 500 color coating. Finish of flashing, trim and exposed fasteners **shall** match frame finish.
- ❑ GLAZING: See Section 08800. All glazing on East, South, and West exposures shall have reflective tinting to reduce solar glare and heat transfer.
- ❑ STOOLS: A non-absorbent, easily cleanable surface **shall** be provided at windowsills. Mechanically anchored slate and polymer stools are acceptable. Wood, plastic laminate, metal and concrete masonry unit stools **shall not** be used.

EXECUTION

- ❑ Install according to manufacturer's recommendations.
- ❑ the installed product will be leak tested by an independent testing agency.
- ❑ Field testing of water tightness for 5% of all openings shall be performed. Openings shall be selected by the owner.

END OF SECTION

SECTION 08710 - FINISH HARDWARE

GENERAL

- ❑ A single manufacturer is preferred for lock cylinders, panic devices, door closers and key cabinets.
- ❑ The contractor **shall** include a cross-index showing numerical listing of door numbers and the associated hardware sets in their submittal for review by design consultant.
- ❑ All hardware will be approved by the owner before ordering, if incorrect hardware is ordered it will be replaced at contractors expense including any damage to doors resulting from incorrect hardware being installed.

PRODUCTS

- ❑ MATERIALS AND FINISHES: Generally finish hardware **shall** be of non-ferrous construction with plated finish; interior door hinges **shall** be steel with plated finish except at areas subject to excessive moisture or chemical corrosion such as shower rooms or laboratories and below flood classrooms where stainless steel hinges are required. Exterior doors **shall** have stainless steel hinges (US32D) unless part of hurricane impact door's package. Standard finish for all hardware shall be satin chrome.
- ❑ PANIC DEVICES: Preferred device **shall** be as manufactured by Von-Duprin. At exterior doors, devices **shall** be "dogged-in" for push-pull door operation during school hours with ANSI 03NL "night latch" operation for night time entrance doors and 02 lockset operation at night time "exit only" doors. Dogging device **shall** be operated by a key. Function of device at fire-rated doors **shall** be 08L with dogging feature omitted and supplied with break-away trim #996L. Fire rated double doors with smoke closers **shall** be equipped with non-concealed vertical rod exit devices. Preferred device is the Von Duprin. **If door is desired to be kept open it may have a magnetic hold open device that releases automatically with the fire alarm being activated .**
- ❑ The center case on all exit devices must be through bolted to the outside trim (pull) and the hinge end **shall** be through bolted.
- ❑ LOCK AND LATCH SETS: **Shall** be heavy-duty mortise locksets by Schlage at all areas predominantly used by students and staff. Exposed screws in knobs and/or rose are not acceptable.
- ❑ Exterior locksets shall have Stainless Steel trim.
- ❑ LOCK CYLINDERS: Cylinders shall be manufactured by Schlage and be IC core type.
- ❑ DOOR KEYING: All openings shall be keyed using the Everest system. All door lock cylinders shall be a 6 pin Schlage key way. All keying must be approved by the Owner before cylinders/locks are ordered during a keying conference. The manufacturer shall furnish the Owner with a final biting list on all projects. Use only one keyway per school and each keyway must be exhausted before using another. On new projects, locksets **shall** be provided with the construction temporary lock cylinders provided by the owner where requested by C.M. Key supplier **shall** provide permanent cores prior to substantial completion for installation by the Owner. All keys **shall** be stamped with appropriate key symbols and "DO NOT DUPLICATE." No biting numbers are to be stamped on the key.

- ❑ KEY CABINET: It is preferred that cabinets be Lund. Other acceptable manufacturers are MMF Industries, Tel-Kee and P.O. Moore Company. Size of cabinet **shall** provide for 50% expansion capacity.
- ❑ SURFACE CLOSERS: At doors, **use** overhead surface mounted closers, LCN with 10 year warranty. Closers **shall** be mounted on inside of building. Provide parallel arm, EDA type, and/or hold open type where use dictates. Where "stop" is part of arm bracket, **use** "spring cush" arm mounted at maximum possible swing. All closers shall be attached with through bolts. Knox box to be provided by contractor and installed at a location selected by owner.

- ❑ OVERHEAD CONCEALED CLOSERS: While not recommended, where required to be concealed, **use** heavy duty concealed closers. Attach arm to door with through-bolts. Prior to the use of concealed closers, written approval must be obtained from the Owner.
- ❑ HINGES: **shall** be full mortise, 5-knuckle type with ball bearings. **Use** heavy-duty stainless steel hinges with non-removable pins at all exterior doors except at main entry and stairwell doors which will be continuous equal to Ives 112 HD. 4 hinges required on all exterior doors and all doors wider than 3' – 0". Use heavy duty aluminum continuous hinges at all stairwell and main entry doors equal to Ives 112 HD. Minimum hinge size will be 4 1⁄2 x 4 1⁄2" for all butt type hinges. All doors with closers shall have BB type hinges or continuous type hinges.
- ❑ FLUSH BOLTS: are recommended for use at foot and head of inactive leaf of double doors to unoccupied areas such as storage and equipment rooms. Bolts **shall** be mortise type, except for mechanical and electrical rooms which will be surface mounted.
- ❑ FLOOR AND WALL STOPS: **Use** concealed fasteners. Wall stops are preferred wherever feasible. Reinforce gypsum wallboard partitions with wood blocking at wall stop locations. Exterior doors stops shall be floor type Ives FS18L or approved equal.
- ❑ OVERHEAD HOLDERS: When necessary holders should be surface mounted type with shock absorber.
- ❑ DOOR SILENCERS & WEATHER STRIPPING: **shall** be gray rubber suitable for metal jambs but omitted at all exterior doors were weather stripping will be furnished equal to Hager 891S.
- ❑ All exterior doors shall have heavy duty door closers equal to LCN 4040 XP.

EXECUTION

- ❑ LOCKSETS: Privacy locksets, **with indicator, shall** be provided at individual faculty and student toilet rooms. These locksets **shall** release upon turn of knob from inside and have an emergency release feature on outside. Staff bathrooms shall require a key to operate except in assembly areas kitchen, and teacher lounges or directed otherwise by building department hardware reviewer.
- ❑ ROOM NUMBERING: The architect **shall** work with the Owner to provide permanent room numbering system for door keying and signage based upon FISH. This will be completed and shown on completed drawings to match the new facilities and be in agreement between new facilities and drawings.
- ❑ CLOSERS: **shall** be provided at fire doors, exterior doors, office doors as directed by building official, to lobby/corridor areas, and kitchen toilet doors.
- ❑ STOPS: Detail doors and frames to swing doors maximum degree possible. Heavy duty wall stops and floor stops (where they are not a tripping hazard) are preferred. Where possible, set stops to provide a minimum 105 deg. door swing. The minimum door swing opening **shall** be 95 deg.. Floor and wall stops **shall** be located a minimum of 3/4 width of door from hinge side. Wall stops will not be used at exterior doors unless approved by building official.
- ❑ DOOR SILENCERS: **shall** be provided at each door. Install three (3) at single doors up to 7 ft.-2 in. high, four (4) at single doors over 7 ft.-2 in. and two (2) at each pair of doors. All hardware to be reviewed and approved by district building department before ordering. Exception is at doors with weather stripping acting as door silencer.

FINISH HARDWARE GUIDE SPEC

PART I - GENERAL

1.01 WORK INCLUDED

A. The work in this section shall include furnishing of all items of finish hardware as hereinafter specified or obviously necessary to complete the building, except those items that are specifically excluded from this section of the specification.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Hollow Metal Doors and Frames
B. Aluminum Doors and Frames
C. Wood Doors and Frames

1.03 DESCRIPTION OF WORK

A. Furnish labor and material to complete hardware work indicated, as specified herein, or as may be required by actual conditions at building.
B. Include all necessary screws, bolts, expansion shields, other devices, if necessary, as required for proper hardware application. The hardware supplier shall assume all responsibility for correct quantities.
C. All hardware shall meet the requirements of Federal, State and Local codes having jurisdiction over this project, notwithstanding any real or apparent conflict therewith in these specifications.
D. FIRE-RATED OPENINGS:
   1. Provide hardware for fire-rated openings in compliance with A.I.A. (NBFU) Pamphlet No. 80 and NFPA Standards NO. 101. This requirement takes precedence over other requirements for such hardware. Provide only hardware that has been tested and listed by UL for the types and sizes of doors required, and complies with the requirements of the door and door frame labels.
   2. Where panic exit devices are required on fire-rated doors, provide supplementary marking on door UL label indicating Fire Door to be equipped with fire exit hardware and provide UL label on exit device indicating “Fire Exit Hardware”.
E. FASTENERS:
   1. Hardware as furnished shall conform to published templates generally prepared for machine screw installation.
   2. Furnish each item complete with all screws required for installation. Typically, all exposed screws installation.
   3. Insofar as practical, furnished concealed type fasteners for hardware units that have exposed screws shall be furnished with Phillips flat head screws, finished to match adjacent hardware.
   4. Door closers, overhead holders and exit devices to be installed with closed head through bolts and sex bolts.

1.04 QUALITY ASSURANCE:

A. The finish hardware supplier shall prepare and submit to the architect six (6) copies of a complete schedule identifying each door and each set number, following the numbering system and not creating any separate system himself. He shall submit the schedule for review, make corrections as directed and resubmit the corrected schedule for final approval.

Approval of schedule will not relieve Contractor of the responsibility for furnishing all necessary hardware, including the responsibility for furnishing correct quantities.

B. No manufacturing orders shall be placed until detailed schedule has been submitted to the architect and written approval received.
C. After hardware schedule has been approved, furnish templates required by manufacturing contractors for making proper provisions in their work for accurate fitting, finishing hardware setting. Furnish templates in ample time to facilitate progress of work.
D. Hardware supplier shall have an office and warehouse facilities to accommodate the materials used on this project. The supplier must be an authorized distributor of the products specified.
E. **The hardware manufacturers are to supply both a pre-installation class as well as a post-installation walk-thru. This is to insure proper installation and provide for any adjustments or replacements of hardware as required.**

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Wrap protect finishing hardware items for shipment. Deliver to manufacturing contractor's hardware items required by them for their application; deliver balance of hardware to job; store in designated location. Each item shall be clearly marked with its intended location.

1.06 WARRANTY:

A. The material furnished shall be warranted for one year after installation or longer as the individual manufacturer's warranty permits.
B. Overhead door closers shall be warranted in writing by the manufacturer against failure due to defective materials and workmanship for a period of ten (10) years commencing on the Date of Final Completion and Acceptance, and in the event of failure, the manufacture is to promptly repair or replace the defective unit with no additional cost to the Owner.

PART II - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. To the greatest extent possible, obtain each kind of hardware from only one manufacturer.
B. All numbers and symbols used herein have been taken from the current catalogues of the following manufacturers.

PRODUCT	ACCEPTABLE MANUFACTURER	SUBSTITUTE SPECIFIED
Hinges	Ives, Hager	Stanley
Locks & Latches	Schlage Mortise	None (No Substitution)
Cylinders, Keys, Keying	Schlage Everest	None (No Substitution)
Exit Devices	Von Duprin	None (No Substitution)
Door Closers	LCN	None (No Substitution)
OH Stops/Holders	Glynn Johnson	Sargent
Wall Stops/Floor Stops, Flush bolts	Ives	Rockwood
Kick Plates	Ives	Rockwood
Threshold/Weather-strip	National Guard, Hager	Pemko, Zero
Silencers	Ives	Rockwood

C. If material manufactured by other than that specified or listed herewith as an equal, is to be bid upon; permission must be requested from the architect seven (7) days prior to bidding. If substitution is allowed, it will be so noted by addendum.

2.02 FINISH OF HARDWARE:

A. Exterior hinges and interior hinges in areas subject to excessive moisture or chemical corrosion to be Stainless Steel (US32D). All other interior Hinges to be Satin Chrome (US26D). Door Closers to be Aluminum. Locks, exit devices and overhead holders to be Satin Chrome (US26D). Flat goods to be Satin Chrome (US26D) or Stainless Steel (US32D) and all thresholds to be mill finish Aluminum.

2.03 HINGES AND PIVOTS:

A. Hinges on all exterior out swinging doors shall be furnished with non-removable pins (NRP) or be continuous.
B. Doors 5’ or less in height shall have two (2) butts. Furnish one (1) additional butt for each 2’6” in height or fraction thereof. Dutch door shall have two (2) butts per leaf. All exterior doors shall have 4 hinges minimum, HD ball bearing or be continuous.

2.04 KEYING:

A. **All exterior locks and cylinders shall be 6 Pin Schlage Everest key system and all interior locks and cylinders shall be 6 Pin Schlage Everest, all bittings shall be issued by Schlage Lock.**
B. No keys or locks shall be ordered by the Distributor until a keying meeting has been held with Monroe County Schools and the Distributor. Original Face sheets and Signature Cards are to be signed by the school boards authorized personnel only as on file with Schlage Lock. The contractor shall furnish the Owner with a final biting list on all projects. All keying information will be provided by the owner.
C. Provide Three (3) each change keys per lock and Six (6) each grand master and master keys. All exterior keys to be Patent Restricted. All keys shall be stamped with the appropriate key symbols and “Do not Duplicate”. No biting numbers are to be stamped on the key.
D. Owner will supply temporary cylinders or cores during the construction phase as requested by the contractor. The owner is to change out the temporary cylinders for the permanent cylinders. **All cylinders will be IC core type.**

1. Acceptable substitutions:
    a. None (No Substitution)

2.05 LOCKSETS:

A. Mortise locks - ANSI A156.13, Grade 1 Operational, Grade 2 Security, ANSI/ASTM F476-76 Grade 30, UL listed. Levers shall be forged brass, bronze, or cast stainless steel, lever design extruded brass, bronze or stainless steel. Meets A117.1 Accessibility Codes. Steel Case with 3⁄4” throw stainless steel anti-friction latch bolt and a 1” throw stainless steel deadbolt. Lock case shall be field reversible, without opening the lock chassis and universal chassis to accept both knob and lever functions. Lock trim shall incorporate individual lever support springs in each rose or escutcheon. Lever connection by attaching threaded bushings tightened by a spanner wrench. Threaded set screws will not be accepted. Lock spindles shall be two independent inside and outside spindles to prevent manipulation of lock. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame. Lock design shall be Schlage L9000 series 06A design, at all areas predominantly used by students. All exterior trim will be stainless steel.

1. Acceptable substitutions:
    a. None (No Substitution)
2. All exterior doors with exposed latches shall have stainless steel latch guards installed.

2.06 EXIT DEVICES:

A. All devices shall be Von Duprin 98/99 Series in types and functions specified. All devices must be listed under "Panic Hardware" in accident equipment list of Underwriters Laboratories. All labeled doors with "Fire Exit Hardware" must have labels attached and be in strict accordance with Underwriters Laboratories.
B. All exit devices shall be tested to ANSI/BHMA A156.3 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 1,000,000 cycles must be provided.
C. At exterior doors exit devices shall be cylinder dogged for push-pull operation during school hours with ANSI 03NL trim for night time entrance doors and ANSI 02 for night time exit only doors. Fire rated doors to have ANSI 08L, with dogging feature omitted, with break-away 996L trim. Double doors to be equipped with a KR9954 mullion with removable core cylinder. Fire rated double doors with smoke closers shall be equipped with vertical rod exit devices, 9948 series.
D. All surface strikes shall be roller type and come complete with a plate underneath to prevent movement. And shall be provided with a dead-latching feature to prevent latch bolt tampering.
E. All exit devices to receive removable core cylinders.

1. Acceptable substitutions:
    a. None (No Substitution)

2.07 DOOR CLOSERS:

A. All closers shall be LCN 4040 XP series having non-ferrous covers, forged steel arms separate valves for adjusting back check, closing and latching cycles and adjustable spring to provide up to 50% increase in spring power. Closers shall be furnished with "EDA" parallel arm mounted on all doors opening into corridors or other public spaces and shall be mounted to permit 180 degrees door swing wherever wall conditions permit. Furnish with non-hold open arms unless otherwise indicated. Where "stop" is part of arm bracket use "Spring Cush" arm mounted for maximum possible swing. Use spring cush arms for all interior doors with closers that do not require 180 degree swing and 90 degree swing is sufficient. Do not provide door stops at these locations.
B. Door closer cylinders shall be of high strength cast iron construction to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 grade 1 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided, with a 10 year warranty.
C. Door closers shall utilize temperature stable fluid capable of withstanding temperature ranges of 120 degrees Fahrenheit to -30 degrees Fahrenheit, without requiring seasonal adjustment of closer speed to properly close the door.
Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with the standards UBC 7-2 (1997) and UL 10C.

D. Door closers shall incorporate tamper resistant non-critical screw valves of V-slot design to reduce possible clogging from particles within the closer. Closers shall have separate and independent screw valve adjustments for latch speed, general speed, and hydraulic back check. Back check shall be properly located so as to effectively slow the swing of the door at a minimum of 10 degrees in advance of the dead stop location to protect the door frame and hardware from damage. Pressure relief valves (PRV) are not acceptable.

1. Acceptable substitutions:
    a. None (No Substitution)

E. All closers shall be installed with through bolts (sex bolts).

2.08 OVERHEAD HOLDERS:

A. When necessary holders shall be surface mounted type with shock absorbers, equal to Ives FS445 or 449 or use floor stop FS446 or 450.

2.09 TRIM AND PLATES:

A. Kick plates, mop plates, and armor plates, shall be .050 gauge with 32D finish. Kick plates to be 8" high, mop plates to be 4" high, armor plates at cafeteria service doors shall be extend to half the door height and installed at both sides.
All plates shall be two (2) inches less full width of door, except at push plates, pull plates, door pulls, and miscellaneous door trim which shall be as shown in the hardware schedule.

2.10 DOOR STOPS:

A. Doorstops shall be furnished for all doors to prevent damage to doors or hardware from striking adjacent walls or fixtures. Wall bumpers equal to Ives WS402 Series are preferred for interior openings without closers, doors with closers should use cush arm stops, exterior doors furnish floor stops equal to Ives FS18L series. Where conditions prohibit the use of either wall or floor type stops furnish surface mounted overhead stops equal to Glynn Johnson 450 Series.

2.11 THRESHOLDS AND WEATHERSTRIP:

A. Thresholds and weather-strip shall be as listed in the hardware schedule.

2.12 DOOR SILENCERS:

A. Furnish rubber door silencers equal to Ives SR64 for all new interior hollow metal frames, (2) per pair and (3) per single door frame up to 7'2" and (4) per single door over 7'2".

PART III - EXECUTION

2.07 INSTALLATION:

A. All hardware shall be applied and installed in accordance with the Finish Hardware schedule. Care shall be exercised not to mar or damage adjacent work.
B. Contractor to provide a secure lock-up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items that are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses both before and after installation.
C. **No hardware is to be installed until the hardware manufactures have provided a pre-installation class. This is to insure proper installation of the specified products.**

2.08 ADJUSTING AND CLEANING:

A. Contractor shall adjust all hardware in strict compliance with manufacturer's instructions.

Prior to turning project to owner, contractor shall clean and make any final adjustments to the finish hardware.

2.09 PROTECTION:

A. Contractor shall protect the hardware, as it is stored on construction site in a covered and dry place.
B. Contractor shall protect exposed hardware installed on doors during the construction phase.

2.10 KEY CABINET:

A. Set up and index one (1) Key Cabinet that allows room for expansion for 150% of the number of keys for the project.

2.11 HARDWARE SCHEDULE:

A. The following schedule is furnished for whatever assistance it may afford the contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware group, provide door or item with hardware same as required for similar purposes. Quantities listed are for each pair of doors or for each single door.

END OF SECTION

SECTION 09250 - GYPSUM WALLBOARD

GENERAL

- ❑ GYPSUM BOARD STANDARD: Comply with applicable requirements of ANSI/ASTM C 840 for application and finishing of gypsum board, unless otherwise indicated.
- ❑ STEEL FRAMING STANDARD: Comply with applicable requirements of ASTM C 754 for installation of steel framing for gypsum board.

PRODUCTS

- ❑ STEEL FRAMING: Partitions and ceilings **shall** comply with ASTM C 754.
- ❑ GYPSUM BOARD: Provide gypsum board of types indicated in maximum lengths available to minimize end joints:

EXECUTION

- ❑ INSTALLATION: Install steel framing to comply with ASTM C 754 and ASTM C 840.
- ❑ GYPSUM BOARD INSTALLATION: Install and finish gypsum board to comply with ASTM C 840.
- ❑ All walls shall be finished with an orange peel texture
- ❑ Hi-Impact XP board shall be specified to a height of 9' AFF in all areas.
- ❑ Regular XP board shall be specified for drywall above 9'.
- ❑ All board shall extend completely to floor.
- ❑ Corner guards shall be installed on **ALL** outside corners of corridors and other high traffic or high potential damage areas. Minimum of 2"x2" 1/8th" Mill finished aluminum "L" is the preferred corner guard. Powder coat if needed to match building finish.
- ❑ No unfinished gypsum board will be permitting in the building, finish must be at least Level 1-P
- ❑ Storage prior to installation shall be within a watertight, dried-in space.

END OF SECTION

SECTION 09650 - RESILIENT FLOORING

GENERAL

- ❑ Acceptable types of wall base are Rubber Cove or Straight Base. Cove base is to be used with resilient tile flooring and straight base is to be used with carpet. Installer **shall use** maximum lengths available to minimize joints and **shall i**nstall preformed or molded corner units at all 90 deg. intersections.
- ❑ For each type of product required, including adhesives, cleaning compounds, and other accessories, provide the same product by one manufacturer throughout the project and specify that all products have low VOC's.
- ❑ Tile should not be solid colors nor should very light or very dark colors be specified.

PRODUCTS

- ❑ For vinyl composition tile, premium product lines of the following manufacturers, provided they comply with requirements of the contract documents and have a low VOC, **will** be considered acceptable:
  1. Armstrong World Industries, Inc.
  2. Mannington Commercial
  3. Equal as approved by Architect.
- ❑ Any tile and mastic specified **shall** be free of asbestos and 1/8 in. gauge.
- ❑ For wall base, products of the following manufacturers, provided they comply with requirements of the contract documents and have a low VOC, **will** be considered acceptable:
  1. Burke Industries, Inc.
  2. Flexco Company
  3. Johnsonite, Inc.
  4. The R.C. Musson Rubber Company
  5. Roppe Corporation
  6. Equal as approved by Architect.

EXECUTION

- ❑ **A manufacturer's recommended moisture test shall be performed prior to installation of any flooring,** to verify vapor barrier integrity and that concrete surfaces have cured sufficiently for proper adhesive bond to be achieved between the sub floor and the resilient tile. Sub-floor surface shall be cleaned, level, and patched prior to installation.
- ❑ Ventilate areas thoroughly during and after installation prior to occupancy.
- ❑ Resilient edge strips **shall** be used in locations shown on drawings, or where otherwise required, to protect edge of resilient flooring. Install resilient edge strips securely with recommended adhesive to achieve a tightly butted joint.
- ❑ When an edge strip is needed at a transition between carpet and tile flooring, it **shall** be specified as a metal edge strip and installed per manufacturer's specification, securing it to the sub floor using mechanical fasteners and not adhesives.
- ❑ When using floor tile on a ramp within a building, a non-skid tile should be used and **shall** meet all handicap codes.
- ❑ Walk off carpet areas shall be provided at all main exterior entrances inside the doorway. This is to reduce tracked in dirt and to prevent slips on other flooring by reducing water.
- ❑ The contractor shall consult with the Owner on the proper cleaning specification required.
- ❑ The contractor shall provide the owner with 2% extra material for each type of floor tile used.

END OF SECTION

SECTION 09900 - PAINTING

GENERAL

- SINGLE SOURCE RESPONSIBILITY: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- All interior surfaces shall receive an orange peel texture.
- White should not be the primary interior wall color.
- Provide independent testing of paint system at least two times during the project. One test will be between 10 -20% and the second between 50 and 75% testing. Testing shall be an MCSD approved agency. Testing shall include thickness of coats and chemistry including pH.
- Provide a five year workmanship and product warranty.
- Provide a letter of warranty from the construction management firm insuring that any paint system failure including but not limited to peeling, cracking, premature or uneven fading, and effervescing will be repaired within 30 days of notification at no additional cost to the owner.

PRODUCTS

- PAINT: **shall** have a reflective value of 60-80%. At wall surfaces **use** semi-gloss paint. Provide finish in high traffic areas that can be scrubbed.
- Use epoxy paint at corridors, kitchens, toilets and other high use areas.
- Paint on exterior concrete shall be a textured multicoated system equal to Sonneborn or Texcote.
- Except in toilet areas, specify water based solvent and mercury free paint with low or zero VOC's.
- Provide gloss finishes in toilet areas.
- Limit number of paint colors to available standards. Coordinate colors to enhance school spirit.
- BLOCK FILLER: **shall** be applied to all exposed masonry block. Specify products with low or zero VOC's.
- Caulking – all exterior caulking to be painted will be polyurethane, latex acrylic caulk will not be used at any exterior location.

EXECUTION

- COLOR SCHEMES: Avoid sophisticated color schemes. Limit paint colors to two (2) per wall surface. Provide wainscot in corridors, stairways, and other high use areas of a relatively dark color.
- STORAGE: Store unused materials in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg. F. Protect from freezing.
- PROJECT CONDITIONS: **Do not** apply paint in rain, fog or mist, nor if air, surface, or paint material temperatures are below 50 deg. F. nor when relative humidity exceeds 85% nor when temperature is less than 5 deg. F. above the dew point. **Do not** apply paint to damp or wet surfaces.
- No visible unpainted surfaces will be permitted.
- All exterior ferrous metal shall receive a multi-coat finish suitable for corrosion protection in a salt corrosive environment. Exterior equipment, not ordered with a factory finish suitable for salt environment shall receive a field coat of protective finish compatible with factory finish.
- Exterior walls will not be painted until approved by building department under any circumstances.

END OF SECTION

SECTION 10110 – DRY ERASE BOARDS & TACKBOARDS

GENERAL

- Dry erase boards and tack boards **shall** be provided in accordance with the building program for each specific project. At a minimum, there shall be at least one marker board and one tack board in each instructional space. Attention to the constraints of applicable codes governing the use of combustible materials is required. Coordinate location with owner.

PRODUCTS

- DRY ERASE BOARDS: **shall** have 24 gauge porcelain enamel steel faces with backer board in extruded aluminum frame with marker tray and head tack strip. Finish **shall** be manufacturer's standard glossy white. Core **shall** be at least 3/4 in. thick particleboard material backed by either foil or aluminum for moisture seal.
- TACKBOARDS: **shall** be vinyl coated tack boards with a minimum 3/8" thick industrial grade fiberboard core material.
- TACKSTRIPS: **shall** be 1/4 in. thick composition cork in extruded aluminum frame. Width of tack strip **shall** be 1 in. at dry erase board installations and 2 in. elsewhere. Map hooks and flag holders **shall** be provided at all tack strip installations including at head of dry erase boards. Provide two (2) flag holders per room. At art rooms, hooks **shall** also be provided.
- PEGBOARDS: **shall** be 1/4 in. hardboard with 9/32 in. diameter holes on 1 in. centers in extruded aluminum frame.
- ACCESSORIES: Furnish standard continuous box-type extruded aluminum marker tray with slanted front and cast aluminum end closures for each dry erase board. Furnish map rail complete with 1 in. to 2 in. wide display rail, end stops, and 2 map hooks for each 4 feet of rail.

ACCEPTABLE MANUFACTURERS

1. Claridge Products and Equipment, Co.
2. Greensteel
3. Best-Rite Chalkboard
4. Marsh Industries
5. Nelson/Adams (NACO)

WARRANTY

- Lifetime Guarantee under conditions of normal use. Should not exhibit excessive fading of color, crazing, cracking or flaking.

EXECUTION

- All dry erase board, tack board, tack strip and pegboard units **shall** be factory assembled.
- Size, location and mounting height of dry erase boards, tack boards and tack strips **shall** be according to building program requirements. Bottom of boards **shall** be no more than 34 in. from finished floor.
- At physical activity spaces such as dance studios, gyms, and multi-purpose rooms, **do not** provide protruding chalk trays at dry erase board installations. Instead, provide recessed holders for markers and erasers.
- Coordination with switches, devices, other equipment and receptacles is the responsibility of the Contractor.
- Provide tack boards at each main exterior entrance.

END OF SECTION

SECTION 10426 - IDENTIFYING DEVICES

GENERAL

- An exterior sign **shall** be required at each exterior classroom door. Interior signs **shall** be required at all doors and spaces. Final room names and numbers will be furnished by the Architect and approved by the Owner.

PRODUCTS

- INTERIOR SIGNS: **shall** be manufactured from 1/16 in. clear matte acrylic that is sub-surface printed with a background color and laminated to a 1/16 in. opaque contrasting colors acrylic base and has 1/16 in. raised acrylic letters, Andco Series 850-16 or equal. All signage **shall** comply with SREF & ADA Standards.
- EXTERIOR SIGNS: **shall** be cast high-grade aluminum ingots free of gas holes and other imperfections or aluminum-fabricated signs. Separate signs for room name and room number required.
  1. Size: 4 inches high by necessary length required to accommodate characters.
  2. Thickness: 3/32 inch minimum for cast and ¼" for fabricated.
  3. Border: 3/16 inch satin finish or cast only.
  4. Background: Pebbled with charcoal baked on enamel finish on cast and polished surface on fabricated.
  5. Letters: Letters and number shall have width to height ratio between 3:5 and 1:1and a stroke width to height ratio between 1:5 and 1:10. Letters and numbers shall be raised 1/32-inch, uppercase, sans serif or simple sans serif type and shall be accompanied with Grade 2 Braille. Raised characters shall be 5/8-inch high minimum and 2 inches high maximum.
  6. Mounting **shall** be with non-removable oval head screws at locations directed by Architect. (stainless fasteners)
- INTERIOR SIGNS: No abbreviations **shall** be permitted at elementary schools. Abbreviations are strongly discouraged at middle and high schools.
- Each room will be provided with two signs. One sign will state the FISH room number. The second sign will provide the name of the space. In order to provide for future flexibility all efforts should be made to provide generic names. For example rather than "Counsellor's office" the sign should read "Office".
- Provide all emergency signs required by code – occupancy capacity, emergency window, egress signs, etc.
- WALL MOUNTED PANEL SIGNS: Attach panel signs to wall surfaces using the method indicated below.
  1. Mount with non-removable stainless steel oval head screws, using plastic plugs where mounted on masonry.
  2. Caulk around edges of signs.

END OF SECTION

SECTION 10520 - FIRE EXTINGUISHERS AND CABINETS

GENERAL

- ❑ Fire Extinguishers **shall** be located as required by local code officials and in accordance with the recommendations of NFPA 10, "Standard for Portable Fire Extinguishers".

PRODUCTS

- ❑ CABINETS: **shall** be 12 in. x 27 in. x 8 in. for semi-recessed or recessed installation. Breakable transparent glazing **shall** be scored Plexiglas or tempered glass.
- ❑ All fire extinguishers accessible to the student population, including classrooms shall be located in cabinets.
- ❑ Specify recessed cabinets for all corridor locations. Maintain integrity of all rated walls.
- ❑ FIRE EXTINGUISHERS: **shall** be supplied by the Contractor.

EXECUTION

- ❑ Install cabinets at the heights required by SREF and local code officials.

END OF SECTION

SECTION 12304 – BELOW FLOOD CASEWORK

GENERAL

- Countertops below flood shall be quartz. All casework below flood shall be made of a marine grade polymer. Laminated wood products should not be used in below flood classroom applications.
- Rooms below flood elevation hinges and pulls shall be stainless steel.
- Manufacturers' products **shall** be publicly cataloged. Manufacturer **shall** show evidence of a minimum of five (5) years of experience in providing manufactured casework systems for similar types of projects, produce evidence of financial stability, bonding capacity, and adequate facilities and personnel required to perform on this project.
- Samples:
  1. Submit samples of casework manufacturer's standard polymer colors, patterns and textures for exposed and semi-exposed materials for architect's selection. Samples of other materials or hardware **shall** be made available if requested.
  2. Architect may request representative full-size samples for evaluation prior to approval. Samples may be impounded by architect/owner until completion of project to ensure compliance with specifications.
- Production Drawings:
  1. Submit shop drawings for casework systems and countertops showing plan view layout of units with relation to surrounding walls, doors, windows, and other building components, elevations, ends, cross-sections, service run spaces and location of services.
  2. Coordinate shop drawings with other work involved. Casework manufacturer to provide shop drawings for all trades involved in installation of casework.
- Deliver completed casework and countertops only after wet operations in building are completed, store in a ventilated place, protected from the weather, with relative humidity range of 20% to 50%
- Protect finished surfaces from soiling and damage during handling and installation with a protective covering.
- Humidity and Temperature Controls:

1. Advise contractor of requirements for maintaining heating, cooling, and ventilation in installation areas as required to reach relative humidity necessary to maintain optimum moisture content. (See Product Handling).

- All materials and workmanship covered by this section **shall** carry a three (3) year warranty from date of substantial completion. This warranty is a warranty of replacement and repair only, whereby the manufacturer **will** correct defects in material and or workmanship without charge. It does not warrant any products that have been abused, exposed to excessive loads or left in unconditioned air after occupancy.

PRODUCTS

- Manufacturer and Product Type:
  1. Casework Manufacturers listed below are acceptable subject to compliance with requirements:
     Weather Strong or equal

DEFINITIONS AND MATERIALS

- Listed are definitions and materials commonly used in defining casework. Refer to FABRICATION section for those items selected for use on this project.
- Definitions: Identification of casework components by surface visibility.

1. Open Interiors: Any open storage unit without solid door or drawer fronts and units with full glass insert doors and/or acrylic doors.
2. Closed Interiors: Any closed storage unit behind solid door or drawer fronts, sliding solid doors.
3. Exposed Ends: Any storage unit exterior side surface that is visible after installation.
4. Other Exposed Surfaces: Faces of doors and drawers when closed, tops of cabinets less than 72 in. above finish floor.
5. Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72 in. or more above finish floor.
6. Concealed Surfaces: Any surface not visible after installation.

- ❑ Core Materials:
  1. Particleboard: NOT ALLOWED
  2. Hardboard: NOT ALLOWED
  3. Plywood: Marine Grade PT
- ❑ Glass:
  1. Full sliding glass doors **shall** be 1/4 tempered plate glass, location must be pre-approved by building department. Not approved as exit doors under any circumstances.
  2. Glass insert doors - hinged or sliding wall cabinets **shall** be 1/8 tempered glass.
  3. Glass insert doors - hinged or sliding tall or base cabinets **shall** be 1/4 tempered or laminate safety glass. Sliding doors mounted in aluminum track.
  4. Provide extruded rigid PVC of design to hold and trim glass inserts in framed doors. Available in dove gray, frosty white or light beige to match basic cabinet body, or in contrasting slate gray or black color.

5. All glass **shall** be tempered or safety glass if approved. All exterior glass shall be impact approved glass to meet approved wind speed criteria.

SPECIALTY ITEMS

- ❑ Countertop support brackets, under counter support frames, legs and miscellaneous metal parts **shall** be furniture steel, welded, degreased, cleaned, treated and epoxy powder painted.
- ❑ Structural assembly **will** provide for mounting of closure panels, removable access panels, and field connection of services within.

CABINET HARDWARE

- ❑ Hinges **shall** be five knuckle, institutional grade, 2-3/4@ overlay type with hospital tip. Steel **shall** be minimum .095@ thick and have minimum of nine (9) edge and leaf fastenings. Hinges **shall** pass ANSI-BHMA standard A156.9, Grade 1 requirement for both vertical and horizontal set and sag (pair of hinges **will** hold minimum of 310 pounds); copy of test result **shall** be provided upon request. Casework manufacturer **shall use** specifically engineered screws for attachment of hinges; wood screws **shall not** be permitted. Doors 48@ and over in height **shall** have three (3) hinges per door. Provide magnetic door catch with minimum seven (7) pound pull, attached with screws and slotted for adjustment. Color to be brushed chrome.
- ❑ Door and drawer front pulls **shall** be epoxy finished metal wire style, 96mm spacing on fasteners. Pull design **shall** be compatible with Americans with Disability Act (ADA), Federal Register Volume 56, No. 144, specifically paragraph 4.27.4. Other pulls may be acceptable pending architect approval. Color to be brushed chrome.
- ❑ Drawer Slides: Standard use and knee space drawers **shall** have a 100 pound load rating at full extension and a built-in, positive stop both directions, with self-closing feature. Slides **shall** have a lifetime warranty as offered by the slide manufacturer.
- ❑ File drawer slides **shall** be full extension. Slides **shall** have a lifetime warranty as offered by the slide

manufacturer.

- ❑ Adjustable Shelf Supports: **shall** be injection molded polycarbonate, clear color to blend with selected interior finish, friction fit into cabinet end panels and vertical dividers, readily adjustable on 32mm (approximately 1-1/4 in.) centers. Each shelf support **shall** have two (2) integral support pins, 5mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The supports **shall** be automatically adaptable to 3/4 in. or 1 in. thick shelving and **shall** provide non-tip feature for shelving. Supports are designed to readily permit field fixing of shelf if desired. Structural load testing **shall** show loading to 1,040 pounds (260 pounds per support) without failure.
- ❑ Chain bolts **shall** be 3 in. long, **shall** have a 18 in. pull and an angle strike to secure inactive door on cabinets over 72 in. in height. Elbow catches **shall** be used on inactive doors up to and including 72 in. in height.
- ❑ All locks in individual rooms to be keyed alike.
- ❑ Sliding Door Track: for both glass and laminate sliding doors **shall** be anodized aluminum double channel.
- ❑ Coat Rods: **shall** be 1-1/4 in. diameter, 14 gauge chrome plated steel installed in captive mounting hardware.
- ❑ Hanging File Suspension Rails: All file drawers **shall** include a pair of 14 gauge steel hanging file suspension rails, epoxy coated. File followers, or other split bottom hardware, **shall not** be acceptable.
- ❑ Mirrors: **shall** be 1/4 in. thick polished mirror plate. Must be safety glass.
- ❑ Undercounter Support Frame: Welded steel countertop support frames **shall** be provided at all knee spaces where indicated on drawings. Frames **shall** be available in 3 in. increments to clear span 24 in. to 60 in. width. Frames **shall** readily accept pencil and knee space drawers, and **shall** be designed to interface undercounter support brackets.

FABRICATION

- ❑ Fabricate casework to dimensions, profiles, and details shown.
- ❑ Cabinet Body Construction: follow manufacturer's recommendations.
- ❑ Core **shall** be 3/4 in. thick plywood or ¾" marine grade polymer in below flood applications.
- ❑ Unit backs **shall** be made of marine grade polymer.
- ❑ All fixed undercounter and tall units **shall** have a separate base.
- ❑ All undercounter units except sink base units **shall** be provided with full sub-top. Sink base units **shall** be provided with open top, front welded steel/epoxy painted sink rail full width at top front edge concealed behind face rail/doors, split back removable access panels and bottom panel to have CL20 high pressure cabinet liner both faces, color to match interior color. Exceptions **will not** be permitted.
- ❑ All end panels and vertical dividers, except sink base units, **shall** be prepared to receive adjustable shelf hardware at 32mm (approximately 1-1/4 in.) centers. Door hinges, drawer slides and pull-out shelves **shall** mount on line boring to maintain vertical alignment of components and provide for future relocation of doors, drawers, shelves and/or pull-out shelves.
- ❑ All exposed and semi exposed edges of basic cabinet components are factory edged.
- ❑ Adjustable shelf core **shall** be 3/4 in marine grade polymer up to 30 in. wide, 1 in. thick marine grade polymer over 30 in. wide.
  1. Any shelving over 30 in. wide **shall** have a mid-shelf support or steel shelf stiffener.
  2. All shelves designated for chemical storage shall have a ½" raised lip on the front edge.
- ❑ Balanced construction of all panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), **will not** be permitted. No exceptions.
- ❑ Painted finishes on drawer sides and/or bottom **will not** be permitted.
- ❑ Bottoms constructed of Marine grade polymer.

- ❑ Door/Drawer Fronts: Marine grade polymer to be used.
- ❑ Double doors **shall** be used on all cabinets in excess of 24 in. wide.
- ❑ Exterior faces **shall** be Marine grade polymer.
- ❑ QUARTZ COUNTERTOPS: All nominal 1 in. thick quartz countertops shown on drawings **shall** be constructed with ¾" in. marine grade plywood core. Provide tight joint fasteners where needed. Exposed edges and corners **shall** be machine profiled to 1/8 in. radius for safety. Coordinate selection with owner.

EXECUTION

- ❑ INSPECTION: The installer must examine the job site and the conditions under which the work under this section is to be performed, and notify the contractor in writing of unsatisfactory conditions. **Do not** proceed with work under this section until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
- ❑ Condition casework to average prevailing humidity conditions in installation areas prior to installing.
- ❑ Install casework with factory-trained supervision authorized by manufacturer. Erect casework; plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.
- ❑ Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer. **Use** filler as necessary for ease of operation.
- ❑ Repair or remove and replace defective work as directed upon completion of installation.
- ❑ Clean all surfaces, repair minor damage per marine grade polymer manufacturer's recommendations. Replace other damaged parts or units.
- ❑ Advise contractor of procedures and precautions for protection of casework and tops from damage by other trades until acceptance of the work by the owner.

END OF SECTION

SECTION 15000 – GENERAL PLUMBING & MECHANICAL REQUIREMENTS

GENERAL

- The following Design Criteria are general items that **shall** apply to the design of all Plumbing and HVAC Systems in the buildings. All exterior fasteners shall be hot dipped galvanized or stainless steel. All water faucets shall be sensor type, non-mechanical.

CONSTRUCTION REQUIREMENTS

- Piping shall not be run above switchboards and panelboards.
- Distance between water piping and electrical panels and switchboards should be in accordance with Code requirements. At least 10 ft. is ideal but may not always be possible.
- To provide consistent electrical equipment and consistency in suppliers, contractor should coordinate requirements for this equipment.
- **Do not** locate pumps, motors, or other equipment requiring routine maintenance overhead. Locating equipment overhead or above ceilings should be avoided.
- **Do not** use in-line exhaust fans located above ceiling.

OPERATING AND MAINTENANCE MANUALS (See Section 01000-General Data)

- Four (4) complete sets of operation and maintenance manuals **shall** be delivered to the owner through the A/E two (2) weeks before the pre-final inspection is held.
- The O&M manuals **shall** be installed in 3 ring heavy back note books with the name of the building and the words "Operations and Maintenance Manuals" permanently affixed to the cover and spine.
- The manuals **shall** contain the following items as a minimum:
  - Index and page numbers
  - Certificate of substantial completion
  - A summary sheet of warranties with the dates noted and a copy of all warranties
  - List of all subcontractors and suppliers with names, addresses and phone numbers
  - Complete start-up operation, and shut-down procedures for each system including sequence of events, locations of switches, emergency procedures and any other critical items
  - Complete set of current shop drawings and equipment description showing all capacities and other operation conditions
  - Equipment summary showing all capacities and ratings (HP, Tons, kW, Filter size, etc.)
  - All submittal data and shop drawings
  - Include spare parts list as data requested.

FINAL INSPECTIONS (See Section 01000-General Data)
POST INSPECTION (See Section 01000-General Data)

END OF SECTION

SECTION 15050 - PLUMBING SYSTEM, GENERAL

GENERAL

- ❑ All provisions of the "General Plumbing & Mechanical Requirements Section 15000" **shall** apply to this section.
- ❑ All water consuming devices **shall** be the water saving type.
- ❑ Contractor **shall** be required to completely rod and flush out all sanitary waste lines both new and existing after a building is completed.
- ❑ Tempered water **shall NOT** be provided at all locations.
- ❑ Provide chrome finished metal set screw type (no snap on) escutcheon rings at all exposed ceiling and wall penetrations.
- ❑ Provide isolation valves in cold water and hot water piping so that water can be shut off to each classroom wing, administration area, group toilets, groups of individual toilets by pod, and science classrooms. Valve locations shall be clearly marked and identified. If above ceiling a sticker on the ceiling grid should show the location.
- ❑ Plaster type P-traps for all art room sinks.
- ❑ Provide trap primers connected to a used water source. Connecting primers to hose bibs is not acceptable.
- ❑ Provide floor drain with deep seal P-trap and indirect type trap primer.
- ❑ Sensor operated valves shall be provided at all commodes and urinals and hand sink, lavatories in student area – no mechanical faucets shall be permitted. Sloan or Zurn are the preferred flushometers. All sensors must be located according to the manufacturers specifications and must operate correctly for normal use. AC powered devices are preferred. In staff areas mechanical flush valves may be used.
- ❑ Provide ultra-low flow aerators at hand washing sinks.
- ❑ All exterior fasteners shall be hot dipped galvanized or stainless steel.
- ❑ All condensate drains shall be directed to storm sewer or French drain.

END OF SECTION

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SECTION 16000 - ELECTRICAL WORK
GENERAL DESIGN REQUIREMENTS

- ❑ Provide surge suppression on all Main Service Switchboards, telephone, security, intercom, Building Automation System, MATV and fire alarm systems.
- ❑ Provide phase loss protection at electrical panels serving HVAC motors and compressors with automatic reset.
- ❑ Contractor to dimension actual location of all underground conduits on as-built drawings. A minimum of two dimensions from building reference points **shall** be provided and a bury depth indicated.
- ❑ All florescent lights shall be provided with a fuse link.
- ❑ All circuit breakers to be labelled. All labelling to be in accordance with final room signage, therefore do not prepare labels until the signage submittal has been approved.
- ❑ All exit indication lights shall of the photo luminescent type.
- ❑ all exterior fasteners shall be stainless steel; nonmagnetic straps may be hot dipped galvanized, plastic or stainless.
- ❑ Interior lighting control shall **NOT** use a central panel. Standalone devices shall be Wattstopper or equivalent. Contractor to perform initial setup and then readjust after 1 month and 6 months occupancy to correct problems. Each typical area shall be as follows
- ❑ Classrooms and conference rooms use standard wall switch with occupancy switch to turn off after 15 minute vacancy. Do not provide courtesy light in each space that burns 24x7.
- ❑ Electrical, mechanical, and technology rooms – Use dual technology occupancy sensor to turn off after 15 minute vacancy. A blink feature before lights turn out is desirable if possible.
- ❑ Individual toilets and small offices use wall mount occupancy switches to turn off after 15 minutes vacancy.
- ❑ Wall mounted emergency lights shall be LED.
- ❑ Building fire alarm system shall be **Notifier** or non-proprietary system. Proprietary systems similar to Simplex or Siemens are not to be used under any circumstances.
- ❑ Building PA system if used shall be **Bogen.**

OPERATING AND MAINTENANCE MANUALS (See Section 01000-General Data)

- ❑ Specify that six (6) complete set of operation and maintenance manuals **shall** be delivered to the owner through the A/E two (2) weeks before the pre-final inspection is held.
- ❑ The O&M manuals **shall** be installed in three (3) ring heavy back note books with the name of the building and the words “Operations and Maintenance Manuals” permanently affixed to the cover and spine. The manuals **shall** contain the following items as a minimum:

  1. Index and page numbers
  2. Certificate of Substantial Completion
  3. Summary sheet of warranties with dates noted and a copy of all warranties
  4. List of all subcontractors and suppliers with names, addresses and phone numbers
  5. All submittal data and shop drawings

END OF SECTION

Technology Construction Guidelines – Oct. 27, 2009
Ken St. James
Director IT Monroe Co. School Dist.

TECHNOLOGY DESIGN GUIDELINES

DEFINITION

These design guidelines are intended to provide a digital learning environment for the 21st Century incorporating the use of digital multimedia. Systems available consist of installed large display LCD video projector(s), digital document cameras analog and digital playing and recording devices, storage devices, computer network connections, and the potential for digital interactive white boards.

ELECTRICAL INFASTRUCTURE

- Each technology infrastructure drop (CAT 6 Outlets) will be supported 2 quad electrical outlets.
- These electrical outlet will be positioned next to the teachers multimedia outlet and any other student or administrative technology outlet (CAT 6 Outlets) will have blue (color) coded plugs.
- Duplex outlet in the ceiling, no more than 2 feet from the LCD video Projection box. This projector box and electrical duplex box should from 10 – 12 feet from the teaching wall at the center of the room, or in case of LCD White board devices. Confirm projector location with owner.
- Additional classroom electric per DOE spec. or every 8 feet on every wall there should be duplex outlets- not tied into computer panel.

TECHNOLOGY STANDARD for INSTRUCTIONAL SPACES – See attached sketch

- One multimedia teachers outlet located on the Teaching wall (see diagram below) consisting of the following:
    - –(CAT 6 cables) need 1" conduit stubbed up above ceiling grid –support teachers PC, phone, and printer
    - 1 RG 6 coaxial cable CCTV system, 1 ' conduit stubbed above ceiling grid (located in VCR cabinet)
    - 2 - (CAT 6 cables) inside VCR cabinet for projector management 1' conduit stubbed above ceiling grid.
    - quad electrical outlets – Two (2) beside technology drop (CAT 6 Outlets) outside VCR cabinet and one (1) in VCR cabinet
- IP Intercom connection in all areas, 2-Cat 6 cables for IP Intercom speaker connection, terminated (male RJ45) without a faceplate in a single gang box on the front teaching wall (as per teaching wall diagram below) 18" below the ceiling grid.
- One Student station jack consisting of the following:
    - - (CAT 6 cables) – support multiple workstations
    - 2 quad electrical outlets – 1 each side of technology (CAT 6 Outlets)
- LCD video projector box (P box double gang box) – located next to teacher workstation outlet outside the VCR/DVD cabinet:
    - VGA/DVI – 1 ½ conduit stubbed up above ceiling for the VGA/DVI cable (To Projector/From Teacher Desk) double gang box
    - SVGA cable (To Projector/From Teacher Desk)
    - 2 – RCA cables (To Projector/From Sound Enhancement in VCR Cabinet)
    - 1 – mini stereo cable for PC audio (To Sound Enhancement in VCR Cabinet /From Desk)
- LCD video projector box (Video box double gang box) – located above ceiling along with an electrical duplex outlet
    - 1 duplex electrical outlet for projector and wireless access point.
    - 1-VGA/DVI connection
    - 1-S-Video connection
    - 2 – RCA connectors
    - -(CAT 6 cables) 1 for projector management and 2 for wireless access points

- The Interactive White Board (IWB) will not be mounted on walls that could be affected by the buildings A/C ducts. This has the potential of creating vibrations which could affect the picture on the IWB.
- Interactive White Board (IWB) installation – Rooms receiving IWB's will be designated on constructions plans. IWB's will need the same connections/cabling and boxes as described above for the LCD Teacher Workstation outlet.
- The IWB standard for MCSD is SMART.
- All cabling from the LCD Teacher Workstation to the IWB connection will be terminated and receive a 10 foot cable service loop in the ceiling directly above the IWB installed wall location. This installed IWB location will be on the "teaching wall" in each instructional area where IWB's are designated.

TECHNOLOGY STANDARD for Other Spaces

MDF and IDF Racks

- Back bone fiber from MDF to all IDF's should be as follows:
  - All fiber runs will run independently from each IDF back to the central MDF, (no looping through IDF's)
  - All fiber back bone run will be in conduit with interdict.
  - 6 strand on Multi-mode fiber running from MDF to each IDF campus wide (star configuration)
  - 6 strand of single mode fiber running from MDF to each IDF campus wide (star configuration)
  - *50 pair copper analog phone cable running from MDF to each IDF (star configuration). *Discuss further as design architects are chosen.
- Fiber Patch Panels in MDF and IDF –
  - All fiber terminations shall be SC connectors
  - Multi-mode and single mode fiber will be separated and labeled both on the outside of the fiber patch panel and on the inside terminations.
- Cat 6 patch panels
  - 48 and 24 patch panels will be used
    - Separate labeled patch panels for the following:
      - Data – all teacher and student ports
      - Wireless Access Points - 2 CAT 6 per room
      - Projector management – 1 CAT 6 per room
      - IP intercom system – 1 CAT 6 per room
- Wire management in all IDF's and MDF
  - Wire management will be provided as per diagram attached and specified (see Hubble Spec for part numbers)

Lighting Requirements

Common to All Rooms

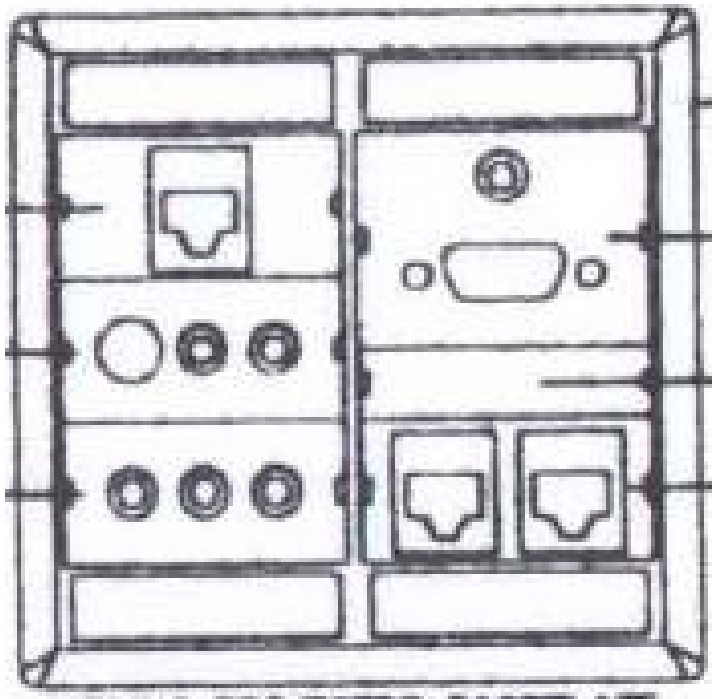
- Provide occupancy sensor to turn lights off in some circumstances, also consider turning lights on. Additional zones may be required depending on the size of the room. and type of lighting installed. Confirm with owner if zone lighting is required,

Basic Lighting

- Lighting design for classrooms shall use multi-level switching and/or dimmable fluorescent fixtures for general seating area. If multi-level switching is used, the switches shall be organized front-to-back by zone.
- Provide manual light controls at teaching station.
- Provide on/off switch at each door.

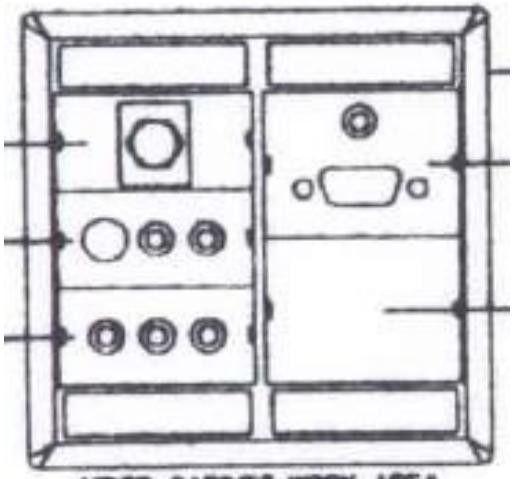
Video LCD– box Video projector box at the Teacher Work area and above the ceiling

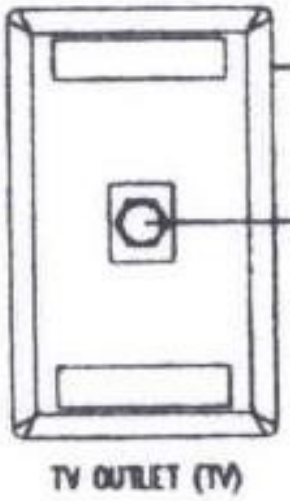
Above the Ceiling Projector



Teacher work area Projector box

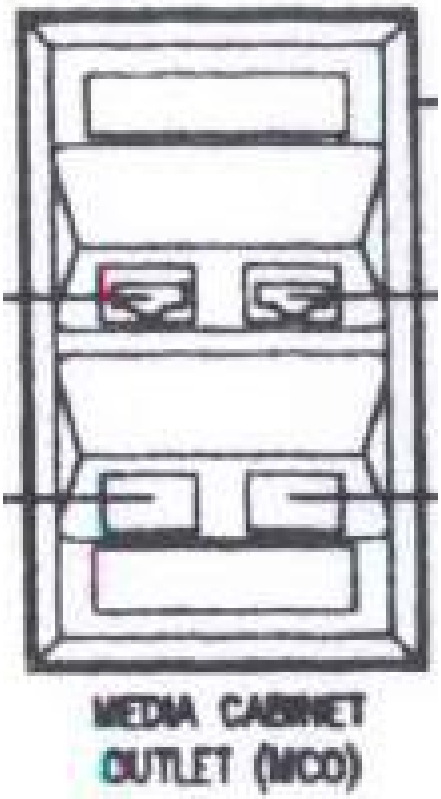
T V Outlet located in VCR cabinets



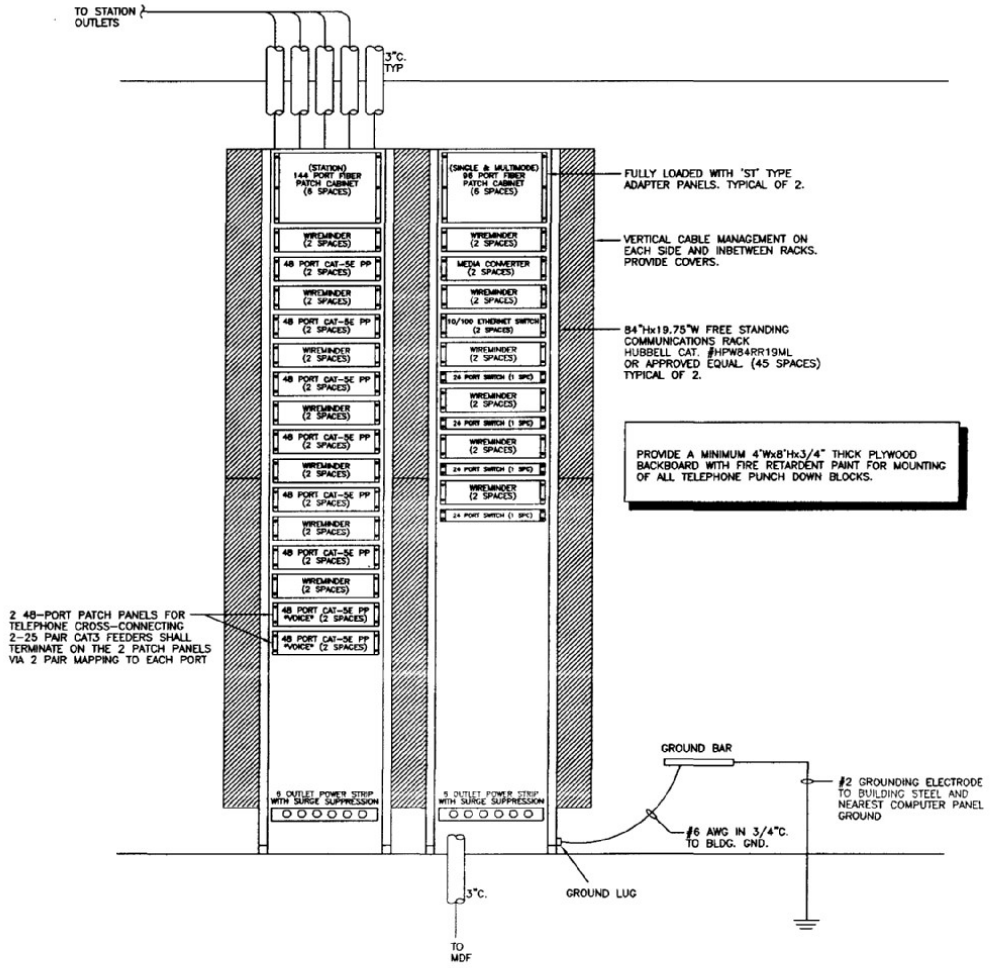


Cat 6 outlet in VCR cabinet for projector management

IDF and MDF Racks

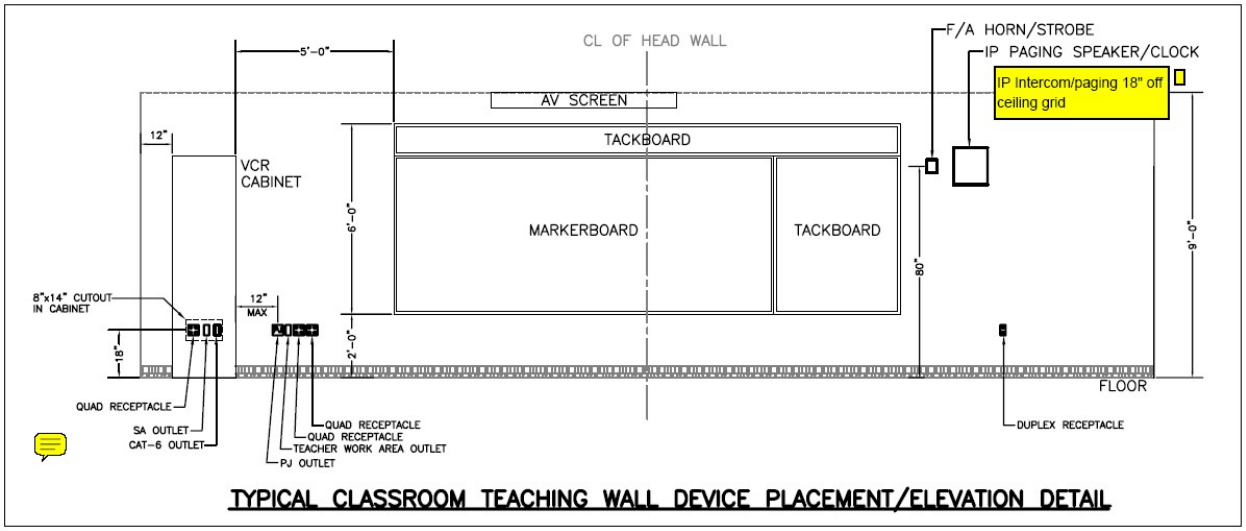


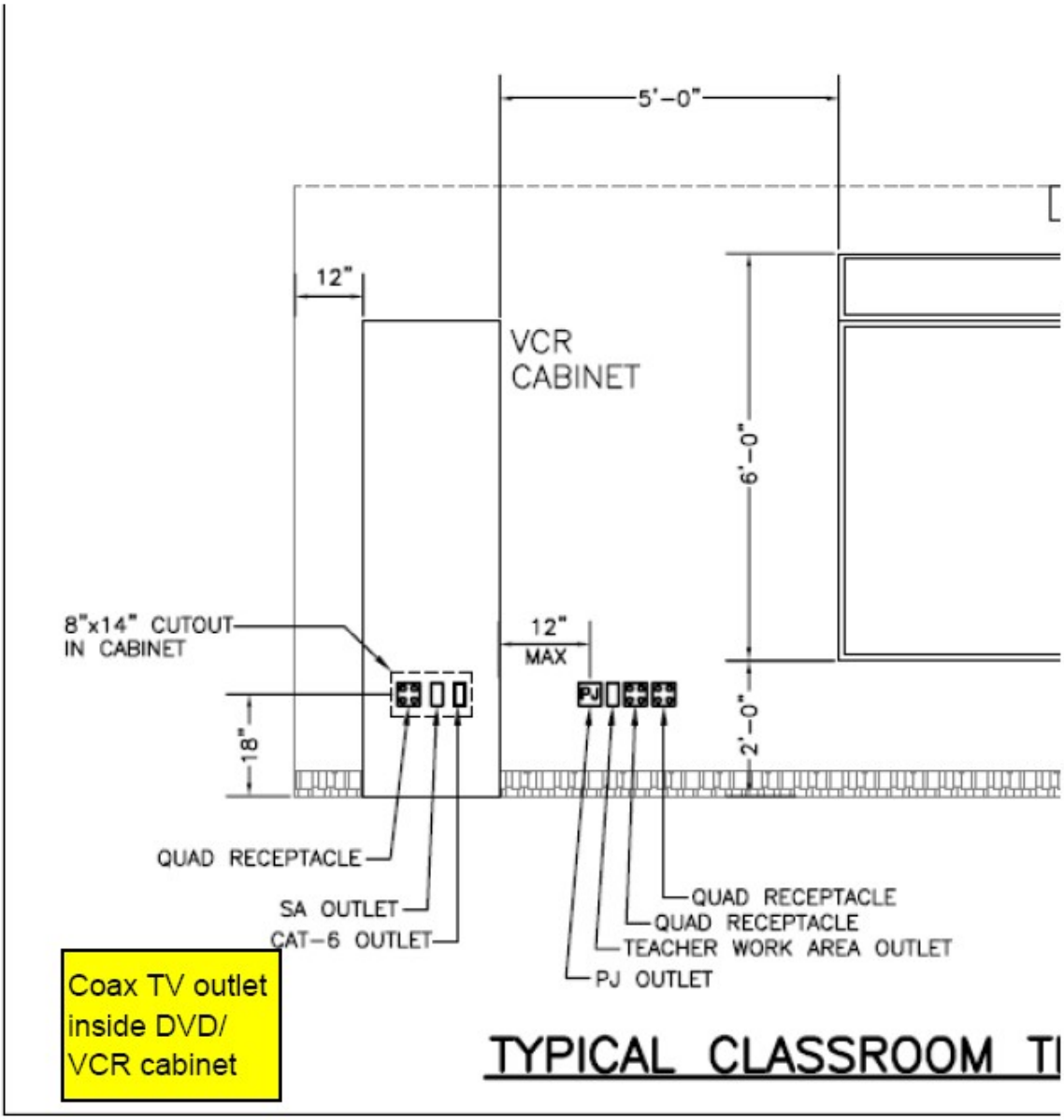
Typical Classroom Teaching Wall – DVD/VCR cabinet



TYPICAL IDF
(MDF SIMILAR - 4 - 19" RACKS)

Typical Teacher DVD/VCR cabinet connection




5'-0"
12"
VCR
CABINET
6'-0"
8"x14" CUTOUT
IN CABINET
12"
MAX
18"
2'-0"
PJ
QUAD RECEPTACLE
SA OUTLET
CAT-6 OUTLET
QUAD RECEPTACLE
QUAD RECEPTACLE
TEACHER WORK AREA OUTLET
PJ OUTLET
Coax TV outlet
inside DVD/
VCR cabinet
TYPICAL CLASSROOM TI