100% Construction Documents

PROJECT MANUAL // **HMC ARCHITECTS**

PALOMAR COLLEGE - ESCONDIDO HEALTH CENTER TI

PROJECT NO. 5015015// 08.26.2016

PALOMAR COMMUNITY COLLEGE

1951 EAST VALLEY PARKWAY
ESCONDIDO, CA 92027

HMC Architects

PALOMAR COLLEGE - ESCONDIDO HEALTH CENTER TI
PALOMAR COMMUNITY COLLEGE
ESCONDIDO, CA

August 26, 2016

HMC # 5015015

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JOHNSON CONSULTING ENGINEERS, INC.
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SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Remove designated building equipment, fixtures, components and utilities to permit installation of new construction.

B. Include Work required to demolish and remove elements of existing construction including partitions, ceilings, flooring, walls, gypsum board and similar elements of existing building construction, all as noted on Drawings or as required to permit installation of new construction. Refer to Cutting and Patching in Section 01 70 00 for differentiation between "Demolition" and "Cutting and Patching".

C. Comply with Title 24, Part 9, California Fire Code, Chapter 33 Fire Safety During Construction and Demolition, during all Phases of project.

1.02 REFERENCES

A. CBC - 2013 California Building Code
   1. CBC-33 – CBC Chapter 33, Safeguards During Construction

B. CCR - California Code of Regulations
   1. CCR-8.4 - Title 8, Subchapter 4, Construction Safety Orders

C. CFC - 2013 California Fire Code
   1. CFC-5 - CFC Chapter 5, Fire Service Features
   2. CFC-7, CFC Chapter 7, Fire-Resistance-Rated Construction
   3. CFC-9 - CFC Chapter 9, Fire Protection Systems
   4. CFC-33 - CFC Chapter 33, Fire Safety During Construction and Demolition

D. ICRI - International Concrete Repair Institute.

E. NFPA - National Fire Protection Association
   1. NFPA 241- Safeguarding Construction, Alteration and Demolition Operations

F. SCAQMD – South Coast Air Quality Management District
   1. SCAQMD-1403 - Rule 1403, Asbestos Emissions from Demolition / Renovation Activities

1.03 ADMINISTRATIVE REQUIREMENTS

A. Pre-Demolition Conference: Conduct conference at Project site to comply with below.

B. Contractor shall schedule meeting after Notice of Award to review demolition operations.

C. Attendance Required: Owner, Architect, Contractor, Demolition Subcontractors, Project Inspector.

D. Construction Process:
   1. Contractor shall discuss overview of demolition procedures.
   2. Contractor shall identify items to be selected by Owner for salvage.
   3. Contractor shall review special requirements for equipment, safety, and noise.

E. Architect will record minutes and distribute copies within seven days after meeting to participants and those affected by decisions made.

F. Regulatory Requirements: Secure demolition permit from the Local Air Quality Management District for renovations involving the removal of 100 square feet/linear feet or greater of demolition, per District Regulations. Notify the AQMD at least 10 working days prior to commencement of demolition/renovation.

1.04 SUBMITTALS

A. Project Record Documents accurately record actual locations of capped utilities.

B. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Submit before Work begins.

1.05 EXISTING CONDITIONS

A. Before beginning Work, investigate and verify existence and location of mechanical, drainage, and electrical systems and other construction affecting Work, including underground utilities.
   1. Before construction, survey and record points of connection of utility services.
   2. Locate invert elevation at points of connection to existing sanitary - and storm drain, water-service piping, and underground electrical services.
   3. Employ a utility service locator company to locate underground utilities.
   4. Verify Owner’s Record Drawings.
   5. Furnish survey of existing utilities.

PART 2 - PRODUCTS

2.01 NOT USED.

PART 3 - EXECUTION

3.01 PREPARATION

A. Disconnect, remove and cap designated utility services within demolition areas. Notify Owner 48 hours in advance of any utility shut-down.

B. Prior to commencement of demolition operations, notify Underground Service Alert of Southern California (800) 422-4133,

C. Protection:

1. Protect existing items that are not indicated to be altered.
2. Adequately protect staff and public from harm and accident during demolition operations by the erection of proper barricades, signs, lighting, guard rails or other safety precautions. Conform to Title 8, Subchapter 4, CCR and NFPA 241.
3. Protective Devices: Install substantial enclosures, weatherproof and dust-proof shields, protective covers, screens and similar devices. Erect and move when necessary to permit use of existing rooms, areas or facilities. Remove entirely when their use is no longer essential. Patch or repair all areas where devices have been removed.

D. Survey of Existing Conditions: Record existing conditions by use of measured drawings preconstruction photographs or video..
1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.02 TEMPORARY MEASURES - LIFE SAFETY

A. Emergency Exits: No enclosure, shield or protective covering shall interfere with use of emergency exits in existing facilities at any time. Rated egress systems shall provide temporary rated egress.

B. Maintain fully charged certified compliant fire extinguishers and water hoses readily available during demolition operations, per Section 906 CBC. Test electrical conductors for disconnection prior to removing.

C. Provide temporary, but equivalent, fire alarm, detection or suppression systems when any system is impaired by Work of this Section. Temporary systems shall be inspected and tested monthly or at other more frequent intervals as required by Owner.
1. Impairment of fire protection systems, Section 3308.6: Impairments to any fire protection system shall be in accordance with Section 901.
2. Systems out of Service: Per requirement of Section 901.7 through 901.7.6, California Fire Code.

D. Maintain free and unobstructed access to emergency services per Title 19, CFC 503.1; 503.1.1, 503.4; and Appendix D, CFC Chapter 33 Sections 3310.1; 3312.1 and when required by Owner.

E. Post NO SMOKING signs in English and Spanish, in number and location as approved by Architect.

F. Reduce flammable and combustible fire load to minimum by daily removal of debris.

G. Instruct construction personnel in fire safety and fire drill policies appropriate for areas where demolition operations occur.

H. Deployment, disposition, administration and implementation of any and all safety measures shall be sole responsibility of Contractor.

3.03 EXECUTION

A. Demolish in orderly and careful manner. Maintain protected egress and access at all times.

B. Except where noted otherwise, immediately remove demolished materials from site and dispose legally. Do not utilize Owner's disposal system.

C. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect until re-installation.

D. Do not burn or bury materials on site.

E. Upon completion of Work, leave areas of Work in clean condition.

3.04 SELECTIVE DEMOLITION, REPAIR AND ALTERATIONS WORK

A. New and existing Work that is cut into, altered, damaged, relocated or reinstalled shall be restored to original conditions. Workmanship and materials to conform to applicable provisions of other applicable Sections of Specifications.

B. Cutting Equipment: Jack-hammers and vibratory cutting equipment may be utilized under following conditions:
   1. Approval by Owner.
   2. Time of day and duration of Work on each given day shall be coordinated with Project Inspector and Owner. Minimum of 24 hours advance notice required.
   3. Compressors shall be well muffled.
   4. Every consideration shall be exercised toward comfort of staff and public. Excessive noise or vibrations will constitute just cause for immediate stoppage of Work.

C. Cutting:
   1. Conform to Provisions of Division 01, General Requirements.
   2. Concrete: Cut with saws or other approved method, but do not overcut openings. Reinforcing bars, except where bonded into new concrete, shall be cut off and ends painted with bituminous paint before being enclosed.
   3. Structural Members: Cut only when authorized by Architect and approved by Structural engineer of Record. Agency approvals shall be obtained by Architect, not by Contractor.
   4. Slab-on-grade concrete cutting: saw cut areas indicated, remove aggregate course and excavate subgrade for utility trenches required for depths, and for other non-utility areas as indicated.
      a. Bedding materials for utility trenches: sand consisting of natural or manufactured granular material conforming to Subsection 200-1.5.5, SSPWC, must achieve compaction of a minimum 90%.

b. Backfill, stockpiled fill: Granular, free of debris, no gravel larger than 3 inches in any dimension, non-expansive, approved by the Architect prior to placement on the site. Install clean backfill and re-compact 6" lifts to 90% per ASTM D1557.
c. Install reinforcing steel, match existing sizes and spacing, minimum #3 deformed bars spaced 18" oc. Dowel in place by drilling 12" inches into existing concrete and epoxy in place.
d. Underslab Vapor Barrier: ASTM E 1745, Class A, 15 mils thick, Permeance as tested before and after mandatory conditioning (ASTM E 1745 Section 7.1 and sub-paragraphs 7.1.1 – 7.1.5): less than 0.01 grains/(ft²/hr/inHg).
e. Install and finish Concrete, minimum 3000 psi compressive strength. Finish: to match existing surface.

D. Removal of Existing Floor Finishes:
1. Remove existing floor covering materials in areas indicated.
2. Sandblast concrete floor surfaces (or submit alternate method to Architect for approval) to remove remaining adhesive, mortar, paint and similar materials which will affect bond of new floor coverings. International Concrete Repair Institute, ICRI Concrete Surface Profile CSP #3 (light shot blast).
3. Patch voids with non-shrink grout.
4. Grind high spots and fill low spots to provide an even surfaced substrate for specified new floor covering materials. Leveling materials shall be compatible with mortars and adhesives required to install finish floors. Floors shall not vary more than 1/4 inch in 10 feet as determined with straightedge.

E. Modular Materials
1. Resilient tile (VCT), ceramic tile, quarry tile, or similar materials: Remove to joint line without leaving damaged or defective units where joining new construction. After flooring removal, clean substrates to remove setting materials and adhesives.
2. Wall Removal: Remove tiles, setting materials, bonding or adhesive, metal lath, board materials to joint line or support line on stud. Verify stud to receive new construction.

F. Patching, Repairing and Finishing:
1. Concrete: Edges of existing concrete shall be kept damp for 24 hours and scrubbed with Neat Portland Cement grout just before new concrete is placed. In lieu thereof, an approved epoxy concrete adhesive may be used. Finish shall match existing adjoining Work.
2. Unless otherwise approved concrete shall match strength of existing concrete or be minimum 2,500 psi concrete for patching slabs on grade. Strength of concrete for patching structural members or deck fill shall be determined by Architect. Where cut edges are to remain exposed, finish edges with cement mortar at least 3/4 inch thick, applied over epoxy adhesive and finished to match adjoining surfaces.
3. Concrete mix for patching shall comply with Section 1905A.3 California Building Code
4. Plaster: Dampen edges of existing plaster. Plaster patching shall be of type, thickness and finish to match existing Work.

5. At Removed Flooring Materials: trowel with patching compound, cement based at all areas, leave level, smooth ready to receive new flooring finish materials. At contractor's option install cement-base self-leveling underlayment at no cost to the Owner.
6. At removed casework and equipment: repair and patch surfaces with like materials and to match adjacent surfaces. Leave surfaces in acceptable condition as determined by the Architect to received new finishes.

G. Acoustical Ceilings: Existing acoustical ceiling that will be partially removed or will require patching, shall be repaired (or extended) with materials and suspension system identical to existing materials and suspension system.

H. Painting: Areas to be repainted or patched shall be prepared and finished as specified in Section 09 90 00, Painting. Where painting of existing surfaces is scheduled, paint manufacturer's standard specification for interior or exterior maintenance painting may be utilized, when approved by Architect for each surface application.

I. Holes required through existing stud wall, concrete or masonry construction to accommodate new electrical conduits and piping and ductwork shall be provided as specified in Division 22, Plumbing; Division 23, Heating Ventilating and Air Conditioning; Division 26, Electrical and Division 27 Communications.

J. Holes required through concrete or masonry Work required for structural purposes shall be neatly drilled as required to accommodate specific items. Coring shall be performed with approval of Architect and in accordance with details on Drawings.

K. Work shall be fully coordinated to ensure proper sequence, limits, methods and time of performance. Arrange Work so as to impose a minimum of hardship on present operation of facilities.

L. Remove such existing ceilings, floors, walls, finish materials or equipment as required to complete Work. Restore such surfaces to their original condition after Work is completed.

M. Provide adequate ventilation during all operations to prevent accumulation of dust, fumes, vapors or gases.

N. Miscellaneous Removal Items: Items not specifically mentioned shall be removed as indicated on drawings.

O. Miscellaneous Work: Items not specifically mentioned shall be repaired, patched or finished like new Work or to match existing adjoining surfaces as approved. Surfaces damaged shall be restored to original condition.

3.05 SALVAGE AND DISPOSAL

A. Salvage: Offer Owner first right of refusal for the removed materials that may have residual value. Remove items designated by the Owner to be salvaged with care. Clean, wrap or crate for storage and handling, and deliver to Owner as directed.
1. AV Equipment

2. Markerboards

B. Disposal: Removed material, other than items directed to be salvaged or indicated to be reused, become Contractor's property upon removal, and shall be removed from site. Debris shall be picked up and disposed of, off site, by Contractor promptly and continuously as Work progresses, and not allowed to accumulate. Sprinkle the debris to prevent dust nuisance. Secure and pay for required hauling permits and pay dumping fees and charges. Contractor shall make every reasonable effort to divert debris to recycling or reuse facilities.

END OF SECTION

SECTION 03 01 30

CONCRETE CLEANING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Chemical cleaning of existing concrete surfaces.

1.02 SUBMITTALS

A. Data on cleaning solutions.

B. Manufacturers' application instructions.

1.03 QUALITY ASSURANCE

A. Pre-installation Conference
   1. Convene pre-installation conference one week before starting Work of this Section.
   2. Require attendance of parties directly affecting Work of this Section.
   3. Review conditions and proposed procedures.

B. Mockups: Prepare mockups on existing surface under same weather conditions to be expected during remainder of the Work.
   1. Clean an area approximately 25 square feet for chemical cleaning.
      a. Chemical methods.

1.04 DELIVERY, STORAGE AND HANDLING

A. Furnish materials in manufacturer's packaging including instructions for use.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Do not wash down or wet surfaces when temperature may drop below 40 degrees F within twenty-four hours.

B. Cleaning material shall not contain muriatic acid.

1.06 SEQUENCING/SCHEDULING

A. Perform cleaning of surfaces during hours approved by the Owner.

PART 2 - PRODUCTS

2.01 CLEANING MATERIALS

A. Products of the following manufacturers form the basis for design and quality intended.

1. Prosoco Inc., Kansas City, KS. Product: SURE-KLEAN Light Duty Concrete Cleaner.

B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces to be cleaned are ready for Work of this Section.

B. Beginning of installation means acceptance of existing surfaces and conditions.

3.02 PREPARATION

A. Protect elements surrounding work of this Section from damage.

B. Carefully remove and store fixtures, fittings, finishing hardware, accessories or other items that may be adversely affected by cleaning materials.

C. Close off, areas, materials and surfaces not receiving work of this Section to protect from damage.

D. Provide for thorough ventilation.

3.03 CLEANING EXISTING CONCRETE

A. Cleaning: Minimum percent solution for specific condition of concrete surfaces to remove existing stains, waxes and coatings and leave surface with uniform, natural color and texture.

B. Apply test sections to determine minimum percent solution.

C. Avoid contact with skin and eyes per manufacturer’s instructions.

D. Complete cleaning operation with clean water rinse or special neutralizing rinse to ensure complete removal of all acidic ingredients.

3.04 CLEANING

A. As work proceeds and on completion, remove excess mortar, droppings, smears, stains, efflorescence or other unsightly excess resulting from Work of this Section.

B. Clean surrounding surfaces.

END OF SECTION

SECTION 03 01 31

CONCRETE REPAIR

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Concrete repair.

B. Preparation of concrete and application of repair materials.

C. Repair of concrete internal reinforcement.

1.02 REFERENCES

A. ASTM A82 - Cold-Drawn Steel Wire for Concrete Reinforcement.

B. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

C. ASTM C33 - Concrete Aggregates.

D. ASTM C150 - Portland Cement.

E. ASTM C881 - Epoxy-Resin Base Bonding Systems for Concrete.

F. AWS D1.4 - Structural Welding Code for Reinforcing Steel.

1.03 SUBMITTALS

A. Product Data: Include material descriptions, chemical composition, physical properties, test data, and mixing and application instructions.

B. Qualification Data: For installers to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architects and Owners, and other information specified.

C. Manufacturer’s certificates that products meet or exceed specified requirements.

D. Procedures of repairing and patching concrete walls.

1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain concrete patching and rebuilding materials through one source from a single manufacturer.

B. Comply with manufacturer’s written instructions for minimum and maximum temperature requirements and other conditions for storage.

C. Store cementitious materials off the ground, under cover, and in a dry location.

D. Submit Design of reinforcement splices for review by the Structural Engineer of Record.

E. Welding: AWS D1.4.

1.05 DELIVERY AND STORAGE

A. Deliver products to site and store in dry location.

1.06 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of concrete and type of repair, splices and mix used.

PART 2 - PRODUCTS

2.01 PATCHING MATERIALS

A. Epoxy Resin: Two-part epoxy adhesive meeting the following minimum characteristics: ASTM C881, Type IV, by SEALTIGHT REZI WELD or equal.

Characteristic	Results
Bond Strength	1,000 psi
Tensile Strength	7,000 psi
Elongation at Break	1 percent minimum
Compressive Strength at 7 days	10,000 psi minimum

B. Bonding Agent: Polyvinyl acetate emulsion, dispersed in water while mixing, non-coagulant in mix, water resistant when cured.

C. Portland Cement: ASTM C150, Type II.

D. Sand: ASTM C33; uniformly graded, clean.

E. Water: Clean and potable.

F. Cleaning Agent: Commercial muriatic acid of 10 percent strength.

2.02 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615, 40 yield grade billet-steel deformed bars, uncoated finish.

B. Stirrup Steel: ASTM A615 40 ksi yield grade.

C. Dowels: ASTM A615; 60 ksi yield grade, plain steel, uncoated finish.

2.03 MIXING EPOXY MORTARS

A. Mix epoxy mortars in accordance with manufacturer's instructions for purpose intended.

B. Mix components in clean equipment or containers. Conform to pot life and workability limits.

2.04 MIXING CEMENTITIOUS MATERIALS

A. Mix cementitious material in accordance with manufacturer's instructions for purpose intended.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work.

B. Beginning of installation means installer accepts existing surfaces.

3.02 PREPARATION

A. Clean concrete surfaces of dirt, laitance, corrosion or other contamination; wire brush using water or appropriate cleaning material.

B. Flush out cracks and voids with water to remove laitance and dirt. Chemically neutralize by rinsing with water.

C. Provide temporary entry ports spaced to accomplish movement of fluids between ports, no deeper than the depth of the crack to be filled. Limit port size diameter to be no greater than the thickness of the crack. Provide temporary seal at concrete surface to prevent leakage of adhesive.

D. For areas patched with epoxy mortar, remove broken and soft concrete. Remove corrosion from steel. Clean surfaces mechanically; wash and rinse with water.

E. Sandblast clean the exposed reinforcement steel surfaces. Mechanically cut away damaged portions of bar and repair.

3.03 REPAIR WORK

A. Repair exposed structural, shrinkage and settlement cracks of concrete by injection-epoxy resin adhesive method. Repair cracks greater than 0.06 inches and less than 0.25 inches.

B. Repair spalling of concrete by the bonding agent and cementitious paste method. Fill voids flush with surface.

C. Patch honeycombing and repair cracks in concrete greater than 0.25 inches by the epoxy-mortar method.

D. Repair reinforcement by welding new bar reinforcement to existing reinforcement. Strength of welded splices and reinforcement to exceed original stress values.

3.04 INJECTION - EPOXY RESIN ADHESIVE

A. Inject adhesive into prepared ports under pressure using equipment appropriate for particular application.

B. Begin injection at lower entry port and continue until adhesive appears in adjacent entry port. Continue from port to port until entire crack is filled.

C. Remove temporary seal and excessive adhesive.

D. Clean surfaces adjacent to repair and blend finish.

3.05 APPLICATION - EPOXY MORTAR

A. Trowel apply mortar mix. Tamp into place filling voids at spalled areas.

B. For patching honeycomb, trowel mortar onto surface, working into honeycomb to bring surface flush with surrounding area. Finish trowel surface to match surrounding area.

C. Cover exposed steel reinforcement with epoxy mortar; feather edges to flush surface.

3.06 APPLICATION - CEMENTITIOUS MORTAR

A. Apply spray coating of bonding agent to concrete surfaces. Provide full surface coverage.

B. Apply cementitious mortar by steel trowel. Tamp into place filling voids at spalled areas. Work mix into honeycomb.

C. Damp cure cementitious mortar for four days.

3.07 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Division 01, General Requirements.

END OF SECTION

SECTION 03 30 00

CONCRETE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cast-in-place concrete.

B. Formwork, shoring, bracing and anchorage.

C. Concrete reinforcement and accessories.

D. Related Sections
1. Section 09 05 61, Common Work Results for Flooring Preparation
2. Section 09 06 00, Schedules For Finishes.

1.02 REFERENCES

A. CBC - 2013 California Building Code
1. CBC Chapter 11B, Accessibility to Public Buildings, Public Accommodations, Commercial Facilities and Publicly Funded Housing
2. Chapter 17A, Structural Testing and Special Inspections
3. CBC-19 - CBC Chapter 19A, Concrete

B. ADA – Americans with Disabilities Act of 1990, as amended
1. ADA Standards – ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.

C. CBC - 2013 California Building Code.

D. ACI 301 - Structural Concrete for Buildings.

E. ACI 302.1R-04 - Guide for Concrete Floor and Slab Construction.

F. ACI 318-2011 - Building Code Requirements for Structural Concrete and Commentary

G. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.

H. ASTM A706 - Low-Allow Steel Deformed Bars for Concrete Reinforcement.

I. ASTM E 1745 – Water Vapor Retarders Used In Contact with Soil or Granular Fill Under Concrete Slabs.

J. ASTM C33 - Concrete Aggregates.

K. ASTM C94 - Ready-Mixed Concrete.

L. ASTM C150 - Portland Cement.

M. ASTM C171 - Sheet Materials for Curing Concrete.

N. ASTM C856-04 - Practice for Petrographic Examination of Hardened Concrete.

O. ASTM E-96 - Water Vapor Transmission of Materials.

P. ASTM E1155 - Test for Determining Floor Flatness and Floor Levelness.

Q. ASTM F1869 - Test Method for Measuring Moisture Vapor Emission.

R. ASTM C1028 Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.

S. CSS - Caltrans Standard Specifications, Latest Edition.

T. SSPWC - Standard Specifications for Public Works Construction, Latest Edition.

1.03 SUBMITTALS

A. Product data for each type of manufactured material and product included.

B. Design mix for each concrete mix.

C. Steel reinforcement shop drawings, including materials, grade, bar schedules, spacing, bent bar diagrams, arrangement and supports.

D. Submit contraction (crack control) joint, expansion, isolation and construction joint layout to Architect for approval.

1.04 QUALITY ASSURANCE

A. Source Limitations: Specified cement and aggregates shall be from single sources only.

1.05 REGULATORY REQUIREMENTS

A. Conform to Chapter 19A, California Building Code, 2013.

1.06 TESTS

A. Testing and analysis of concrete will be performed under provisions of Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

A. Materials shall conform to CBC-19A, Sections 1903A and 1906A.

B. Plywood for Forms: medium density overlay APA, MDO PLYFORM APA, unless indicated otherwise.

1. For concrete scheduled for coated, smooth-form finish, use high density overlay HDO PLYFORM.
2. For concrete scheduled for exposed, rough-form surface, use PS-1, Group 1, exterior plywood.
3. For concealed surfaces, use, PS-1Class I, Exterior, APA PLYFORM B-B.

C. Lumber for Forms: Douglas Fir species; construction grade with grade stamp clearly visible. Furnish surfaced one face and one edge, where required for smooth form finish.

D. Tubular Forms: fiber-reinforced, spirally wound, paperboard forms with integral form-release liner, seamless, Sonotube by Sonoco, Hartsville, SC, or equal, approved in accordance with Division 01, General Requirements, for substitutions.

E. Form Ties: Removable metal of adjustable length, cone ends.

2.02 REINFORCING

A. Reinforcing Steel: ASTM A615, deformed billet steel bars, in grades as follows, and conforming to CBC-19, Section 1913A.2.
1. For No.4 and larger bars, use 60 ksi yield grade.
2. For ties and stirrups, and No. 3 and smaller bars, use 40 ksi yield grade.
3. For welded bars, use ASTM A706 60 ksi yield grade.

B. Welding Electrodes: low hydrogen grade E90XX for Grade 60 [E70XX for Grade 40].

C. Dowels: ASTM A615; 40 ksi yield grade, plain steel, uncoated finish.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I or II, Portland Cement Type, conforming to Section 1913A.1, CBC. [Color: White for colored concrete per Section 03 35 00]

B. Aggregates: Per CBC1903A.6
1. Aggregates for Stone Concrete: ASTM C33 and CBC
2. Aggregate for Lightweight Concrete: ASTM C330 and CBC.

C. Water: Clear, from potable source, and not detrimental to concrete.

D. Wheelchair lift ramp mortar: Ardex K301, Mapei Quickcem Top 101 or equal. Finish with manufacturer's cement dressing products for smooth surface.

2.04 ACCESSORIES

A. Bonding Agent: Polyvinyl Acetate; HIBOND, manufactured by Lambert Corporation, Orlando, FL, LOCK BOND NO. 906, manufactured by MacklanBurg-Duncan Co., City of Industry, CA, or equal as approved in accordance with Division 01, General Requirements for substitutions.

B. Underslab Vapor Barrier: ASTM E 1745, Class A, 15 mils thick, Permeance as tested before and after mandatory conditioning (ASTM E 1745 Section 7.1 and sub-paragraphs 7.1.1 – 7.1.5): less than 0.01 grains/(ft²/hr/inHg).
   1. Subject to compliance with requirements, acceptable products include, but are not limited to, the following:
      a. Stegowrap Vapor Barrier, Stego Industries LLC
      b. Reef Industries, VaporGuard
      c. Reflex Super, Monarflex USA
      d. Perminator, W. R. Meadows.
      e. Or equal

C. Non-Shrink Grout: ASTM C1107, premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 4,000 psi in 24 hours and 8,000 psi in 7 days; of consistency suitable for application and a 30 minute working time.

D. Combination Hardener, and Sealer: ASTM C779, ASHFORD FORMULA by Curecrete Chemical Co., Springville, UT; SHUR-SEAL by Paul M. Wolff Co., Orange, CA; Chemprobe CT Densifier 629 by Tnemec Company; LIQUI-HARD by W.R, Meadows, or equal as approved in accordance with Division 01, General Requirements for substitutions, at exposed concrete floors. ****Hardeners and sealers cannot be applied over curing compounds without removing compound****SHUR-SEAL approved by LA Co. Health Dept.****will not take aggregate (sand) for slip resistant***

E. Form Release Agent: Colorless non-staining liquid chemical agent, free of wax or oils which will not absorb water. Material shall comply with AQMD, Local Regulations.

F. Corners: Chamfered type; maximum possible lengths.

G. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

H.

2.05 CURING MATERIALS

A. Water: Clean and drinkable.

B. Water Curing: Equipment required to fog spray, no sprinkling permitted.

C. Polyethylene Film: ASTM C171, 10 mil thick, white polyethylene film, single sheet, manufactured from virgin resin with no scrap or additives, free of visible defects, uniform in appearance.

2.06 CONCRETE MIX

A. Mix and deliver concrete in accordance Sections 1905A.1.1, 2013 CBC and Chapter 5 ACI 318-11.
   1. Design Mix: Conform to Section 1905A.1.1. 2013 California Building Code for Proportioning on the basis if field experience or trial mixtures method.

2. Do not exceed 0.50 water-cement ratio by weight for floor slabs and for other concrete.

B. Select proportions for concrete in accordance with the approved design mix.
1. Required Strength: As scheduled.

C. Provide concrete to the following criteria:

Element	Min. 28 day Strength psi	Max. Slump	Max. Size Aggregate	
Grade Beams and Foundations	3,000	4 inch	3/4 inch	Normal wt. Concrete
Slabs	4,000	4 inch	3/4 inch	Normal wt. Concrete
Structural slabs above steel deck	3,000	4 inch	3/4 inch	Lightweight Concrete
Other	3,000	4 inch	3/4 inch	Normal wt. Concrete

D. Do not use admixtures containing calcium chlorides or any type of admixture unless approved by the Architect of Record, Structural Engineer of Record **.**

2.07 GRANULAR FILL

A. Crushed Aggregate Base (capillary break): 3/4 inch maximum grading, crushed rock and rock dust conforming to requirements of Section 200-2.2, SSPWC, with 3/8 inch sieve requirement waived, or Class 2 Aggregate Base as defined in Section 26, CSS.

2.08 JOINT DEVICES AND FILLER MATERIALS

A. Fiber Expansion Joint Filler - ASTM D1751: Closed cell, 1/2 inch max. thick; FIBER EXPANSION JOINT by American Highway Technology, Kankakee, IL, FIBRE EXPANSION JOINT or DECK-O-FOAM by W. R. Meadows, Dayton Superior or approved equal.

B. Joint Devices: Integral extruded polystyrene plastic; 1/2 inch thick, with removable top strip exposing sealant trough; JOINT CAPS.

C. Primer: As recommended by sealant manufacturer.

D. Joint Backing: ASTM C1330, Cylindrical, Type C, closed cell, polyethylene backer rod; oversized 30 to 50 percent larger than joint width. Green Rod by Nomaco Inc. or equal.

E. Sealant: Polyurethane two-component type, self-leveling, for level surface application, UREXPAN NR-200 or DYNATRED for sloped surfaces, manufactured by Pecora Corp., Harleysville PA, or equal. Color shall be selected by Architect from manufacturer's standard list of colors.

F. Saw Cut Joint Filler: Two-component epoxy resin, gray color, non-hardening, self-leveling, SIKADUR 51 (SL), by Sika Corp., Lyndhurst, NJ, or equal as approved in accordance with Division 01, General Requirements for substitutions.

PART 3 - EXECUTION

3.01 FORMWORK

A. Verify lines, levels and measurement before proceeding with formwork.

B. Hand trim sides and bottom of earth forms; remove loose dirt.

C. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of Chapter 6 of ACI 318-11.

D. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

E. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

F. Align joints and make watertight. Keep form joints to a minimum.

G. Obtain approval before framing openings in structural members which are not indicated on Drawings.

H. Provide chamfer strips on external corners.

I. Surface irregularities, ACI 347R Class A, gradual or abrupt irregularities of 1/8 inch for exposed to view concrete. Class B, 1/4 inch for plaster cement finish.

J. Place form liners accurately to provide finished surface texture indicated. Provide solid backing and attach securely to prevent deflection and maintain stability of liners during concreting. Prevent form liners from sagging and stretching in hot weather. Seal joints of form liners and form liner accessories to prevent mortar leaks. Coat form liner with form-release agent.

3.02 PROTECTION

A. Adequately protect staff, personnel and public from harm and accident during formwork. Conform to California Code of Regulations, Title 8, Subchapter 4, Construction Safety Orders.

B. Protect concrete surfaces that are to be color treated, or to be left exposed as the final finish surface, from damage by construction activities with durable temporary coverings until surface-treatment work commences. Floor protection shall be reinstalled and remain until acceptance by the Architect.

3.03 REINFORCEMENT

A. Place supports and secure steel reinforcement against displacement.

B. Accurately place and securely tie reinforcement with black annealed wire and securely hold in position during placing of concrete by means of precast concrete block supports. Point wire tie ends away from the form. Unless otherwise indicated, the number, type, and spacing of supports shall conform to the ACI 315.
   1. Tie reinforcement splices and intersections per CBC and CRSI, Chapter 10-General Principles for Placing, Splicing and Tying Reinforcing Bars.

C. Reinforcing: Steel # 4 bars: Place bars at 18 inches on center each way for slabs and #5 bars for footings unless otherwise indicated on Drawings.

3.04 PREPARATION

A. Install Vapor Emission Treatment Systems where tests reveal presence of more than acceptable moisture level in accordance with Test Method ASTM F 1869 or ASTM F 2170.

B. Prepare previously placed concrete by cleaning with sandblasting to remove laitance and expose clean aggregate.

C. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert 10 inch long No. 3 steel dowels at 18 inches oc and pack solid with non-shrink grout.

D. Under Interior Slabs on Grade: Install 4 inches thick crushed aggregate base per Section 200-2.2, SSPWC or Class 2 CCS as capillary break. Over aggregate base place 15-mil vapor barrier in largest practical sections. Seal all 6-inch lapped seams, penetrations and foundation perimeters using manufacturer-approved tape only and install per manufacturer instructions. Install pipe boots at pipe penetrations. Install rigid insulation **.** Install reinforcement and concrete as scheduled.
   1. Installation of vapor barrier shall be in accordance with ASTM E 1643 and manufacturer's instructions.
   2. Tapes, mastics, sealants, and other products used with vapor barrier shall be from same manufacturer as, and certified compatible with, vapor barrier.

3.05 PLACING CONCRETE

A. Place concrete in accordance with Section 5.7 of ACI 318-11. Remove loose dirt from excavations.

B. Notify Architect minimum 24 hours prior to commencement of operations. All excavations, forms and reinforcing shall be inspected and approved by the Architect prior to placement.

C. Ensure reinforcement, inserts, embedded parts and accessories are not disturbed during concrete placement.

D. When detailed on the drawings, separate slabs on grade from vertical surfaces with 1/2 inch thick joint filler.

E. Extend joint filler from bottom of slab to within ½ inch of finished slab surface using one-component polyurethane sealant as specified in Section 07 92 00.

F. Place concrete continuously between predetermined expansion, control and construction joints.
   1. Install expansion joints at vertical concrete walls at 24 feet on center unless noted otherwise on drawings.
   2. Retaining Walls at Buildings: install waterstops in expansion joints to form a continuous waterproofed wall surface condition. Support and protect exposed waterstops during progress of the Work.

G. Contraction Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch, place joints at column lines and at 12 ft. o.c. each way, maximum. Remove groover tool marks on exposed concrete surfaces. Contractor's option: Saw cut joints, early-entry dry-cut, per ACI 302.1R.

H. Saw cut slabs when indicated on drawings, or as approved by Architect, at 12 ft. on center, within 4-12 hours after placing concrete. Saw cut joints with power saws equipped with shatterproof abrasive diamond-rimmed blades, cut 1/8" wide joint into concrete when cutting action will not tear, abrade, or otherwise damage surface. Cut no deeper than 1/4 depth of slab thickness. Fill cuts with non-hardening epoxy. Completely fill cut to surface of slab. Saw cut joints, early-entry dry-cut, per ACI 302.1R.

I. Do not interrupt successive placement; do not permit cold joints to occur.

J. Avoid segregation of materials. Perform tamping and vibrating so as to produce a dense, smooth application free of rock pockets and voids. Do not use vibrators to move concrete horizontally.

K. Provide special mix prepared by the Testing Laboratory and approved by the Architect utilizing smaller aggregates in areas of reinforcing congestion to prevent the formation of rock pockets.

L. The unconfined vertical drop of concrete shall not be greater than 5 feet. Do not allow concrete to fall free from any height that will cause materials to segregate. Maximum height of free fall permitted in any case: 5 feet. Utilize trunks or additional chutes where doubt occurs. Conform to requirements of ACI 318-11 Section 5.10.

M. Construction Joints: Wash surface of each joint shortly after pouring to expose clean, sound aggregate. Sandblast surface to remove laitance remaining or loose aggregate as approved by the Architect. Conform to Section 6.4 ACI 318-11. Apply bonding agent in accordance with manufacturer's instructions. Locate joints within the middle third of spans of slabs, beams and girders. Coincide construction joints with contraction, isolation, or expansion joints when possible. Locate where they lease affect the structural integrity of the element under consideration and are compatible with building's appearance.

N. Isolation Joints: preformed joint filler depth of slab, fill top 1/2 inch with elastomeric sealant per Section 07 92 00. Locations: at columns, footings, and as noted on drawings.

3.06 CONCRETE FINISHING

A. Comply with recommendations in ACI 302.1R for screeding, floating, straightedging, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Trowel Finish: After float finish, minimum 2 trowel operations, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue trowel passes and restraighten until surface us free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

C. Install concrete floors and slabs in Levelness and Flatness in accordance with the following: (SOV=Specified Overall Value and MLV =Minimum Local Value)
   1. Finish floor slabs with modified highway straightedge with tolerances of: FF = 35 SOV and FL = 25 SOV. And FF = 24 MLV and FL = 17 MLV for **slabs-on-grade**.
   2. Finish floor slabs with modified highway straightedge with tolerances of: FF = 30 SOV and FL = 20 SOV. And FF = 24 MLV and FL = 15 MLV for **suspended slabs**.
   3. Finish floors slab with modified highway straightedge with tolerances of: FF = 45 SOV and FL = 35 SOV, and FF = 30 MLV and FL = 24 MLV at **[Gym and] Treated Exposed Concrete Floors [and polished concrete]**.

D. Provide formed and vertical concrete surfaces to be left exposed with smooth Rubbed Finish.

E. Provide multiple steel trowel finish at flat surfaces to receive floor finishes.

F. Seal concrete with Combination Hardener and Sealer at interior exposed concrete floors .

3.07 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads. Conform to Section 6.2 ACI 318-11.
   1. Minimum stripping time for walls and columns: 5 days.
   2. Minimum stripping time for beams and structural slabs: 21 days.

B. Loosen forms carefully. Do not wedge pry bars, hammers or tools against finish concrete surfaces scheduled for exposure to view. Do not break-off corners.

C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms. Reshoring permitted only after 10 days and prior to stripping.

3.08 FINISH AT EXPOSED VERTICAL SURFACES

A. Rubbed Finish: Apply the following to Smooth-Formed Finished concrete per ACI 301:

1. Grout-Cleaned Finish (Sack-rubbed finish): Remove fins, rough spots, stains, and hardened mortar by carefully rubbing with a fine abrasive stone to a smooth even surface. Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part Portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white Portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
2. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part Portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface with slow-speed grinder. In a swirling motion, finish surface with a cork float.

3.09 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury.

B. Maintain concrete with minimal moisture loss at above 50 degrees F temperature for period necessary for hydration of cement and hardening of concrete. Dusting with dry cement to absorb excess water is prohibited.

C. Cure only as specified herein and in accordance with Section 5.11, ACI 18-11. Liquid membrane curing compound method not permitted for interior cast-in-place concrete slabs.

D. Moisture Retaining Coverings: spread polyethylene film over floor slab areas, lapping edges and sides, minimum 6 inches and sealing with pressure sensitive tape; cover with plywood or otherwise protect film from damage; maintain in place for minimum of seven (7) days unless noted otherwise on drawings. Do not permit traffic over floor slabs during the curing period.

E. Vertical Surfaces: fog spray water over surfaces and maintain wet for 10 days.

F. Quality Control: Proper curing of concrete surfaces shall be the responsibility of the Contractor under this section.

G. Flooding, sprinkling or ponding not permitted.

3.10 FIELD QUALITY CONTROL

A. Provide free access to Work and cooperate with Testing Laboratory.

B. Measure floor and slab flatness and levelness according to ASTM E 1155 within 72 hours of finishing.

C. Testing and Inspections in accordance with Division 01.

3.11 PATCHING

A. Architect will inspect concrete surfaces and determine imperfections, if any.

B. Clean all exposed concrete surfaces and all adjoining work stained by leakage of concrete. Remove all fins, butts and projections by grinding. Patch voids, rock pockets, holes, cracks and similar imperfections by chipping loose concrete and exposing clean, sound aggregate.

C. Patch imperfections as approved and in accordance with ACI 301.
   1. Clean all exposed concrete surfaces and all adjoining work stained by leakage of concrete.
   2. Fill cone form tie recesses with portland cement mortar flush to finish surface.

3.12 DEFECTIVE CONCRETE

A. Defective Concrete: Remove concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by Architect.

C. Do not patch, fill, touch-up, repair or replace exposed concrete except upon express approval of Architect for each individual area.

3.13 MOISTURE TEST FOR CONCRETE FLOORS

A. It shall be the General Contractor’s responsibility to provide concrete floor slab meeting the maximum moisture vapor emissions herein specified and the contractor shall exercise care in all aspects of mixing, placing, and curing the concrete floor slabs so that a minimum of mitigation treatment will be required.

B. Prior to ordering adhesive applied floor covering materials or coatings, conduct Calcium-Chloride Test Method in accordance with ASTM F 1869 to verify that concrete floor slabs are dry with maximum moisture vapor emissions of 3 pounds per 1,000 square feet in 24 hours and that slabs exhibit negative alkalinity, carbonation or dusting. Apply the moisture test in four (4) different areas of each floor location, with at least one test for each 1,000 square feet of floor area.

C. Prior to ordering adhesive applied floor covering materials or coating, conduct Relative Humidity Test Method in accordance with ASTMF2170 to verify relative humidity and surface pH of concrete floor slabs, the method
   1. Requires drilling holes at diameter not to exceed outside diameter of probe by more than 0.04 inch to depth equal to 40 percent of slab's thickness (elevated structural slab shall be tested at depth equal to 20 percent of slab thickness).
   2. Place probe to full depth of test hole, place cap over probe.

3. Permit test site to acclimate, or equilibrate, for 72 hours prior to taking relative humidity readings.
4. Remove cap and press button on the probe to obtain reading.
5. Relative humidity readings for substrates receiving non-permeable flooring are 75% or lower.
6. Testing shall require 3 tests in first 1,000 square feet, with one additional test per each additional 1,000 square feet of concrete slab surface.

D. The test area should be at the same temperature and humidity expected during normal use, minimum testing conditions shall be 75± 10 degrees F. and 50± 10% relative humidity. Maintain these conditions 48 hours prior to, and during testing.

E. Alkalinity Testing: Concrete floors shall be tested for alkalinity prior to the installation of adhesive applied floor covering materials or coating. Levels of pH shall not exceed the written recommendations of the flooring covering manufacturer or the adhesive manufacturer, or both.

F. Install Concrete Slab Vapor Emission Treatment as specified in Section 09 05 61 when moisture emissions exceed 3 pounds per 1,000 square feet in 24 hours as specified herein at the time of installation of floor coverings. Submit results to Architect of testing. In the event the moisture tests indicated moisture levels are less than the maximums allowed and results are acceptable to the Architect, and the Concrete Slab Vapor Emissions Treatment is not required as determined by the Architect, Contractor shall provide the Owner a credit for deleting the work specified in Section 09 05 61.

END OF SECTION

SECTION 05 40 00

COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Load-bearing cold-formed structural steel studs.

B. Interior wall framing using Cold Formed Metal Framing at plumbing walls, wall openings and cabinet-supporting walls.

C. Formed steel accessories.

D. Related Sections
1. Section 07 21 00, Insulation.
2. Section 09 29 00, Gypsum Board.

1.02 REFERENCES

A. AISI – American Iron and Steel Institute
1. S100 – Design of Cold-Formed Steel Structural Members.
2. S200 – Cold-Formed Steel Framing – General Provisions.
3. S211 – Wall Stud Design.
4. S212 – Header Design.
5. S213 – Lateral Design.

B. ASTM International
1. A 1003 – Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated.
2. C 645 – Nonstructural Steel Framing Members.
3. A653/A653M - Steel Sheet, Zinc-Coated (galvanized) or Zinc-Iron Alloy - Coated (Galvannealed) by the Hot-Dip Process.
4. C 754 – Installation of Steel Framing Members.
5. C955 - Load-Bearing Steel Studs, Runners, and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.
6. C 1513 – Steel Tapping Screws for Cold-Formed Steel Framing Connections.

C. AWS D1.3 – American Welding Society, Structural Welding Code, Sheet Steel.

D. CBC California Building Code 2013 , Chapter 22A

1.03 SUBMITTALS

A. Provide product data on standard framing members. Describe materials and finish, product criteria, limitations and properties.

B. Mill certificates: signed by the steel sheet producer indicating steel sheet complies with requirements.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in steel studs framing and components with five years minimum experience.

B. Welding: welders certified by AWS.

PART 2 - PRODUCTS

2.01 FRAMING MATERIALS

A. Studs: ASTM A1003, Structural Grade 50, Type H, sheet steel, formed to "wide flange" shape or "C" shape, punched web, 16 gauge (0.056", SSMA designation 54) thick unless noted otherwise on drawings, 50 ksi steel unless noted otherwise on drawings, sizes required to conform to details and scheduled wall thicknesses, and as required for structural performance. Studs shall be rolled from new sheet steel and shall not be produced from re-rolled steel.
   1. Properties: As listed in manufacturer's standard tables for applicable grade of steel and sizes.
   2. Conform to AISI S100 and AISI S200.
   3. Coating: Zinc coated per ASTM A653, G60 .

B. Track: ASTM A1003, Structural Grade 50, Type H, sheet steel, channel shaped, deep leg, 16 gauge (0.056", SSMA designation 54) thick unless noted otherwise on drawings, 50 ksi steel unless noted otherwise on drawings, solid web, long leg at ceilings, profile to produce snug fit over adjacent components.
   1. Conform to S100 – Design of Cold-Formed Steel Structural Members.
   2. Approved pre-fabricated slotted slip track for top of wall: CEMCO Slotted Track (CST) 16 gauge, ICC ESR-2012 or equal as approved in accordance with Division 01, General Requirements for substitutions.
   3. Provide stand-off washers for fasteners.
   4. Install in accordance with manufacturer's recommendations and fire rating requirements.
   5. Coating: Zinc coated per ASTM A653, G60 .

C. Header and Jambs: ClarkDietrich Building Systems, Heavy Duty Studs and Header Brackets.
   1. ProX Header, Brady Construction Innovations Inc. or equal.

D. Stiffener U- Channels and Angles: Minimum Weights as Follows:
   1. 3/4 inch - .3 pound per foot, cold- or hot-rolled channel.
   2. 1-1/2 inches - .475 pound per foot, cold-rolled channel.
   3. 1-1/2 inches - 1.12 pounds per foot, hot-rolled channel.
   4. 2 inches - 1.26 pounds per foot, hot-rolled channel.
   5. 2 inches - .59 pound per foot, cold-rolled channel.
   6. 1-1/2 x 1-1/2 x 3/16 inch angle.

2.02 ACCESSORIES

A. Fastening: Self-drilling, Self-tapping Screws, ASTM C954, galvanized, Buildex/Tomarco Type S-12 point, low profile head screws #10 or equal, 1/2 inch long for two layers 16 gauge metal for non load-bearing framing, welded connections for load-bearing framing and for framing of 16 gauge studs and thicker.
   1. Welding: In conformance with AWS D1.3, minimum weld size 3/32".

B. Anchorage Devices, Powder Actuated:
   1. Install to conform to the load requirements of this Section and Tables 1, 2, 3 and 4 of ICC-ESR 1663 Hilti. Minimum diameter: 0.145" diameter.
      a. Utilize tools as recommended by the manufacture in compliance with ICC numbers.
      b. ICC-ESR 1663 Hilti Inc., Fasteners – Manual, Pneumatic, or Powder-Driven Steel Studs and Nails
   2. Allowable Loads: Limited 100 lbs. Maximum or 80% of ICC approved values. Testing required, refer to Division 01.
   3. Use of Powder actuated fasteners for tension loads is limited to support of minor loads such as suspended acoustical ceilings, ductwork and conduit. Permissible Loads for Ceiling Clip Assembly:
      a. Normal-Weight Concrete: Ceiling Clip Assembly, minimum 0.177 inch diameter, minimum penetration 1-1/2 inch. Required Allowable Loads: 100 lbs. or 80 percent of values listed in ICC Report whichever is less: ICC ES-2184.
         1) Type CC27ALH42 w/DX KWIK, by Hilti, Inc., Tulsa, OK.
      b. Lightweight Concrete: Ceiling Clip Assembly, minimum 0.177 inch diameter, minimum penetration 1-1/4 inch. Required Allowable Loads: 100 lbs. or 80 percent of values listed in ICC ES-2184:
         1) Type CC27ALH32, by Hilti, Inc., Tulsa, OK.

C. Anchorage Devices, Drilled Expansion Anchors:
   1. Wedge Type: KWIK Bolt TZ Concrete Anchor, 3/8 to 3/4 inch diameter, ICC ESR-1917, by Hilti Inc., Tulsa, OK.
      a. Eyebolt HHDCA drill-in anchor for suspended ceilings. Provide minimum ¼-inch size anchor, requires testing refer to Division 01.
   2. Adhesive Anchors System:
      a. For fully grouted CMU, lightweight concrete, construction per ICC ES-1385, Hilti Kwik Bolt 3 (KB3).
      b. For Normal Weight concrete with min. compressive of 2000 psi or 4000 psi. Per ICC ESR-2322, Hilti HIT-RE 500-SD Adhesive Anchor System.

D. Gypsum Sheathing: 5/8 inch thick, ASTM C 1177, moisture and fire resistant, gypsum board with Type X core and inorganic glass fiber mat facing one side. Furnish boards 48 inches wide in lengths that will minimize end-to-end joints with tapered edges and square cut ends.
   1. Acceptable Products
      a. GP, DensGlass Gold Exterior Sheathing
      b. USG, Securock Glass-Mat,
      c. National Gypsum, Gold Bond e²XP
      d. Or equal, approved in accordance with Division 01 requirements for substitutions.

E. Sheathing Joint Tape: self-adhering glass-fiber mesh tape, minimum 2-inches wide, 10-by-10 or 10-by-20 threads-per-inch as recommended by both the sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing board.
   1. Acceptable Products
      a. Perma-Tite Tape--PGM 207A; PermaGlas-Mesh, Inc.
      b. Quik-Tape; Quik-Tape, Inc.
      c. Or equal

F. Sheathing Joint Sealant: siliconized, acrylic-latex sealant approved by both sheathing and sheathing tape manufacturers.
   1. Acceptable Products
      a. Dow Corning 795
      b. Pecora 895
      c. Or equal

G. Backings: Located and as indicated on drawings or 6" x 1-1/4" x 14 gauge flush mount backing, preformed with pre-punched screw holes, FLUSH-MOUNT BACKING by Metal-Lite, Inc., Crossville, TN.

H. Track Bedding Sealant: Per Section 07 92 00.

I. Wall finishes: Per Division 09 Finishes.

2.03 FINISHES

A. Galvanized Finish: Zinc coated per ASTM A653, G60.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verify that substrate surfaces and building framing components are ready to receive work.

B. Beginning of installation means acceptance of existing conditions.

C. Layout markings shall not be made with xylene-based inks, paint, or dyes, or with other solvent-based products that may bleed through finishes.

3.02 ERECTION OF STUDDING

A. Perform work in accordance with, AISI and SSMA/ICC ES - 4943P.

B. Align floor and ceiling tracks; locate to wall or partition layout. Secure in place with specified fasteners at spacing as indicated on drawings or maximum 32 inches on centers.
   1. Set floor track on continuous sealant, each side of track for exterior walls. Sealant type: Butyl Rubber per ASTM C920.
   2. Track Splices: notch flanges to allow sliding tracks past each another 12". Attach as approved by manufacturer of system.

C. Place studs at 16 inches oc typically, or 12 inches oc in plumbing walls or as noted on drawings. Connect studs to tracks using fastener or welding method.

D. No flame (oxyacetylene) torch cutting is permitted, use Plasma Arc cutting to make penetrations for conduit or piping where required.

E. Construct corners using minimum three studs.

F. Install double (boxed) studs at each head, jamb and sill of each exterior and interior door and window opening. Extend studs from floor to underside of structure above. Weld all boxed jamb and header members with interrupted 1/8" welds, one inch long at 12 inches on center.

G. Install 1-1/2 inch standard steel furring channels at right angles to king stud at each door hinge point as permitted by perforations. Weld channel to four studs where possible.

H. Stiffeners: Install 3/4 inch standard steel furring channel stiffeners within 24 inches of top and bottom runners and at mid height of walls eight feet high. At higher walls, install stiffeners spaced maximum 48 inches on centers. Weld stiffeners to each stud and at laps.

I. In areas where a finish material occurs on one side of wall only, provide full width bridging or bracing. Two systems permitted:
   1. Install 3/4 inch x 16 gauge continuous brace through stud punch-outs, fastened to studs with angle clips welded or screw fastened, spaced as scheduled below.
   2. Install 1-1/4 inch x 16 gauge strap, 3/4 inch x 16 gauge or cold-rolled channel continuous across unrestrained edges of studs spaced as scheduled below, screw fastened or welded to each stud, and connected to one blocking member screw fastened or welded to adjacent studs.

J. Bridging or Bracing Schedule:
   1. Stud Size AISI/SSMA Min. bracing spacing unless noted otherwise on structural drawings.
      a. 3-5/8 or 4 in, S-Sections ("c") 2'-6"
      b. 3-5/8 or 4 in, T-Sections ("w") 3'-0"
      c. 6 in, S-Sections ("c") 2'-6"
      d. 6 in, T-Sections ("w") 3'-0"

K. Erect studs one piece full length. Splicing of studs is not permitted, except where detailed.
   1. Where studs have been cut to receive piping conduits and equipment, weld on two 3/4 inch furring channels to restore stability of weakened stud.

L. Erect studs, brace and reinforce full strength to meet design requirements.

M. Extend stud framing through ceiling to underside of floor or roof structure above unless detailed otherwise.

N. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

O. Install intermediate studs above and below openings to match wall stud spacing.

P. Provide deflection allowance of 1/2 inch minimum in stud track, directly below horizontal building framing for non-load bearing framing.

Q. Attach backing as detailed on the drawings for attachment of fixtures anchored to walls.
   1. Where Casework is anchored as part of a larger wall or panel: Refer to Section 06 41 16.

R. Install framing between studs for attachment of mechanical and electrical items and to prevent stud rotation.

S. Touch-up field welds and damaged primed surfaces with primer.

T. Erect 2 stud construction at expansion joints, 20 feet on center or as indicated on Drawings.

3.03 INSTALLATION - GYPSUM SHEATHING

A. Erect exterior gypsum sheathing with long joints perpendicular to framing, with edges butted tight and ends occurring over framing. Install sheathing with glass-mat face exposed to exterior. Install with screws in accordance with ASTM C754 and C840 and GA 216.

3.04 TOLERANCES

A. Maximum Variation from True Position: 1/8 inch in 10 feet.

B. Maximum Variation of any Member from Plane: 1/8 inch.

3.05 CLEANING

A. Clean substrate; remove dirt, oil, grease, construction markings, and foreign matter that could adversely affect final floor finish appearance or performance.

3.06 QUALITY CONTROL

A. Inspection of all field-welding operations shall be performed by qualified and certified Welding Inspector approved by the Structural Engineer.

B. Welding Inspector shall check materials, equipment, procedures, welds and certification of welders. Furnish the Owner with reports verified by the Inspector that welding has been performed in accordance with the Contract Documents.

END OF SECTION

SECTION 06 20 00 - FINISH CARPENTRY

INSTALLATION OF DOORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Installation of wood doors.

B. Installation of door hardware and attachment accessories.

C. Wood blocking backing and nailers.

D. Related Sections:
1. Section 08 12 13, Hollow Metal Frames - Welded.
2. Section 08 14 16, Flush Wood Doors.
3. Section 08 71 00, Door Hardware.
4. Section 09 90 00, Painting.

1.02 REFERENCES

A. ADA – Americans with Disabilities Act of 1990
1. ADA Standards – ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.

B. APA - The Engineered Wood Association.
1. APA Guide – APA Design and Construction Guide

C. BHMA - Builders Hardware Manufacturers Association
1. BHMA A156.1 through 24 - Standards

D. CBC 2013 California Building Code.

E. CBC - 2013 California Building Code
1. CBC-10 - CBC Chapter 10, Means of Egress
2. CBC-11 - CBC Chapter 11B, Accessibility to Public Buildings, Public Accommodations, Commercial Facilities and Publicly Funded Housing

F. CRSC - California Referenced Standards Code (CCR Title 24, Part 12)
1. CRSC-10.2 - Standard 12-10-2 Single Point Latching or Locking Devices
2. CRSC-10.3 - Standard 12-10-3 Emergency Exit and Panic Hardware

G. ITS-WH – Intertek Testing Services-Warnock-Hersey

H. PS - U.S. Department of Commerce, Product Standard
1. PS-1 – Construction and Industrial Plywood
2. PS-2 – American Softwood Lumber Grading Standards

I. SDI – Steel Door Institute

1. SDI-109 - Hardware for Standard Steel Doors and Frames.
2. SDI-122 – Installation for Standard Steel Doors and Frames.

J. UL – Underwriters Laboratories, Inc.
1. UL 1784 - Air Leakage Test for Door Assemblies

1.03 QUALITY ASSURANCE

A. Acceptable Lumber Grading Associations
1. PLIB - Pacific Lumber Inspection Bureau
2. RIS - Redwood Inspection Service, a division of the California Redwood Association
3. WCLIB - West Coast Lumber Inspection Bureau
4. WWPA - Western Wood Products Association

1.04 DELIVERY, STORAGE AND HANDLING

A. Store materials in ventilated, interior locations.

PART 2 - PRODUCTS

2.01 DOOR MATERIALS

A. Flush Wood Doors: As specified in Section 08 14 16.

B. Door Hardware: As specified in Section 08 71 00, Door Hardware.

2.02 WOOD MATERIALS

A. Lumber: Douglas Fir, Hemlock, Ponderosa Pine or Sugar Pine species dried to maximum moisture content of 19-percent, visually selected for vertical or mixed grain suitable for transparent finish.
1. Lumber: PS 20.
2. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.

B. Boards for Trim: kiln-dried to maximum moisture content of 15-percent, solid wood surfaced 4 sides (S4S) and one of the following species and grades.
1. Species: Redwood or Western Red Cedar
2. Grade
a. Redwood: RIS, Architectural, Clear
b. Western Red Cedar: WWPA, C Sel, or equal.

C. Hardwood: kiln-dried to maximum moisture content of 12-percent, and suitable for transparent finish.
1. Species:
2. Grade

D. Plywood: PS 1-07, APA Sanded Plywood Panels, APA, A-C-plugged, Group 1 - Softwood, Exposure - Exterior, with sanded face, and touch sanded back.
1. Thickness: as indicated on Drawings; if not shown, provide minimum 5/8-inch.

2.03 ACCESSORIES

A. Nails: Size and type to suit application, plain finish.

B. Bolts, Nuts, Washers, Blind Fasteners, Lags, and Screws: Size and type to suit application; plain finish, galvanized when exposed to weather.
   1. S-12 Special Steel Screws: 1-15/16 inches long, bugle head, pilot point, 14 gauge to attach plywood to steel studs.

C. Primer: 100-percent acrylic resin, water reducible paint suitable as base coat for finish scheduled in Sections 09 06 00 and 09 90 00.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that openings are ready to receive Work and field measurements are as indicated on shop drawings.

B. Verify mechanical, electrical and building items affecting Work of this Section are placed and ready to receive this Work.

C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION OF FLUSH WOOD DOORS

A. Door shall have clearance of 1/8 inch at the sides and top and shall have bottom clearance of 1/4 inch over thresholds and 1/2 inch at other locations unless otherwise indicated. The lock edge or both edges of door shall be beveled at the rate of 1/8 inch in 2 inches. Cuts made on the job shall be sealed immediately after cutting, using clear varnish or sealer.

B. Machine cut relief for hinges.

C. Pilot drill screw and bolt holes.

D. Prepare doors to receive finish hardware in accordance with applicable BHMA Standards requirements. Seal tops, bottoms and cutouts for hardware and accessories per Section 08 71 00, Door Hardware.

E. Conform to applicable BHMA requirements for fit tolerances.

3.03 INSTALLATION OF HARDWARE

A. Install hardware in accordance with Section 08 71 00, Door Hardware.

B. Exit Devices shall comply with in accordance with CBC 2013 Sections 1008.1.9 and 11B-404.2.7, mounted 34 inches to 44 inches above finish floor, comply with Standard 12-10-3. The unlatching force shall be by Authority having Jurisdiction and may increase the maximum effort to operate doors required to be fire rated to achieve positive latching, but in no case shall the pressure exceed 15 pounds per CBC Section 11B-404.2.9 when applied in the direction of exit travel.

3.04 INSTALLATION TOLERANCES

A. Conform to standard of flatness and squareness as required by SDI-117. Maximum Diagonal Distortion: 1/16 inch measured with straight edge corner to corner, or as required to meet door warranty.

3.05 FIELD QUALITY CONTROL

A. Provide manufacturer's installation instructions for each listed assemblies for review by the Inspection Authority.

3.06 ADJUSTING AND CLEANING

A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 06 41 00

CASEWORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Wood-Veneer-Faced Architectural Cabinets
2. Plastic-Laminate-Clad Architectural Cabinets
3. Plastic-Laminate-Faced Countertops
4. Hardware and Accessories
5. Specified Products Used in Miscellaneous Fabrications as Detailed

B. Related Requirements
1. Division 09 Section “Schedules for Finishes”

1.02 REFERENCES

A. AHA -American Hardboard Association
1. A135.4 -Basic Hardboard

B. ANSI - American National Standards Institute
BHMA - Building Hardware Manufacturers Association
IAPMO - International Association of Plumbing and Mechanical Officials
NEMA - National Electrical Manufacturers Association
NPA - National Particleboard Association
NSF International
1. ANSI/BHMA A156.9 -Cabinet Hardware
2. ANSI/BHMA A156.11 -Cabinet Locks
3. ANSI/BHMA A156.18 -Materials and Finishes
4. ANSI A161.2 -Performance Standards for Fabricated High Pressure Decorative Laminate Countertops
5. ANSI/NEMA LD 3 -High-Pressure Decorative Laminates
6. ANSI/NPA A208.1 -Particleboard
7. ANSI/NPA A208.2 -Medium Density Fiberboard (MDF) for Interior Applications
8. BHMA Certified Products Directory
9. IAPMO/ANSI Z124.3 -Plastic Lavatories
10. IAPMO/ANSI Z124.6 -Plastic Sinks
11. NSF/ANSI 51 -Food Equipment Materials
12. NSF Certified Products Directory

C. ASCE - American Society of Civil Engineers
SEI -Structural Engineering Institute
1. 7 - Minimum Design Loads for Buildings and Other Structures

D. ASTM International
1. A 240/A 240M - Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip

2. C 97 - Absorption and Bulk Specific Gravity of Dimension Stone
3. C 170 - Compressive Strength of Dimension Stone
4. C 501 - Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser
5. C 880 - Flexural Strength of Dimension Stone
6. D 570 - Water Absorption of Plastics
7. D 635 - Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
8. D 638 - Tensile Properties of Plastics
9. D 696 - Coefficient of Linear Thermal Expansion of Plastics
10. D 790 - Flexural Properties of Unreinforced and Reinforced Plastics
11. D 1929 - Determining Ignition Temperature of Plastics
12. D 2240 - Rubber Property-Durometer Hardness
13. D 2583 - Indentation Hardness of Rigid Plastics
14. D 3039 - Tensile Properties of Polymer Matrix Composite Materials
15. D 6272 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials by Four-Point Bending
16. E 84 - Surface Burning Characteristics of Building Materials
17. E 831 - Linear Thermal Expansion of Solid Materials by Thermo-mechanical Analysis
18. G 21 - Resistance of Synthetic Polymeric Materials to Fungi

E. AWI - American Woodwork Institute
WI -Woodwork Institute formerly WI
1. AWS - Architectural Woodwork Standards
2. WI Certified Compliance Program

F. HPVA -Hardwood Plywood & Veneer Association
1. DFV-1 - Voluntary Standard for Sliced Decorative Wood Face Veneer

G. ISSFA -International Solid Surface Fabricators Association
1. ISSFA-2 - Classification and Standards for Solid Surfacing Material

H. SCAQMD - South Coast Air Quality Management District
1. Rule 1113 - Architectural Coatings
2. Rule 1168 - Adhesives and Sealants

1.03 SUBMITTALS

A. Product Data: For each type of product indicated

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
1. Show details full size.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, and other items installed in casework.
4. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
5. Apply WI-certified compliance label to first page of Shop Drawings.

C. Samples:
   1. Lumber with or for transparent finish, not less than 5 inches wide by 24 inches long, for each species and cut, finished on 1 side and 1 edge.
   2. Veneer leaves representative of and selected from flitches to be used for transparent-finished woodwork.
   3. Veneer-faced panel products with or for transparent finish, 8 by 10 inches, for each species and cut. Include at least one face-veneer seam and finish as specified.
   4. Plastic laminates, manufacturer's standard sample size, but not less than 5 by 7 inches, for each type, color, pattern, and surface finish, with 1 sample applied to core material and specified edge material applied to 1 edge.
   5. Corner pieces as follows: Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 inches 450 mm)high by 18 inches 450 mm)wide by 6 inches 150 mm)deep.
   6. Exposed cabinet hardware and accessories, one unit for each type
   7. A minimum 1 foot wide by 6 inch deep, full size sample for each type of counter top indicated, including the edge profile and backsplash.

D. Certificates:
   1. WI Certified Compliance

E. Test and Evaluation Reports: by an independent testing agency for specified criteria

F. Qualification Statements:
   1. Fabricator/installer
   2. Special countertops fabricator

1.04 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications:
   1. Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of not less than 5 years of successful in-service performance, with at least one project in the past 5 years where the value of the woodwork was within 20 percent of the cost of woodwork for this Project.
   2. Single Source Responsibility: A single manufacturer shall provide and install the work of described in this Section
      a. Special countertops shall be fabricated by a company certified by the manufacturer, which may be a separate company from the fabricator/installer of the casework

B. Certifications:
   1. Provide Woodwork Institute Certified Compliance
      a. Before delivery to the jobsite the woodwork supplier shall provide a Woodwork Institute Certified Compliance Certificate indicating the casework products being supplied and Certifying that these products fully meet the requirements of the Grade or Grades specified.
      b. Each elevation of casework and each countertop shall bear a Woodwork Institute Certified Compliance Label.

c. At completion of installation the woodwork installer shall provide a Woodwork Institute Certified Compliance Certificate indicating the products installed, and Certifying that the installation of these products fully meets the requirements of the Grade or Grades specified.

C. Mock-ups: Provide mockups of one base cabinet, one wall hung cabinet, and one countertop. Base cabinet shall have at least one drawer. Mockup shall be of the material and finish to be provided. The Approved Mockup may be incorporated in the project.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Delivery of casework shall be made only when the area of operation is enclosed, all plaster, concrete work, painting, and similar operations that could damage casework are dry and the area broom clean.

B. If casework must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified.

1.06 FIELD CONDITIONS

A. Do not deliver or install casework until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Maintain indoor temperature and humidity within the range recommended by AWS for the location of the project.

PART 2 - PRODUCTS

2.01 GENERAL

A. Performance/Design Criteria: Casework shall comply with AWS requirements for Premium Grade unless noted otherwise, except where more specific or more stringent requirements are specified herein.

B. Casework indicated by 3-digit design numbers on the Drawings, with or without the diamond symbol, refer to the Casework Design Series, AWS Appendix A.

C. Surface Burning Characteristics
1. Provide cores, adhesives, and surfacing with Flame Spread Index of 75 or less and Smoke Developed Index of 450 or less when tested in accordance with ASTM E 84.
2. Fire Resistive Casework: Where required by CBC Table 803.5 or Title 19 CCR Section 3.11, or other locations as indicated on the Drawings, provide cores, adhesives, and surfacing with Flame Spread Index of 25 or less and Smoke Developed Index of 450 or less when tested in accordance with ASTM E 84.
a. Exception: Wood veneers or other surfacing material less than 0.036 inch (0.9 mm) thick.

D. Provide U shaped wire pulls or equally accessible pull hardware at all accessible casework, in accordance with CBC Section 11B-811.4.

2.02 WOOD-VENEER-FACED PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS COUNTERTOPS

A. Materials:
1. General: Provide materials that comply with requirements of AWS quality standard for each type of casework and quality grade specified, unless otherwise indicated.
2. Lumber shall be in accordance with the AWS Grade specified for the product being fabricated. Moisture Content shall be 6 to 12 percent for boards up to 2-inch nominal thickness, and shall not exceed 19 percent for thicker pieces.
3. Core shall be MDF meeting the requirements of AWS, and as follows:
   a. ANSI/NPA A208.2, Grade 130; binder shall contain no urea formaldehyde.
   b. ANSI/NPA A208.1, Grade M-2-Exterior Glue, binder shall contain no urea formaldehyde.
   c. Recycled Content: Provide products with an average recycled content so postconsumer recycled content plus one-half of pre-consumer recycled content is not less than 50 percent.
   d. Fiber content shall be FSC Certified.
4. Hardboard: AHA A135.4
5. Veneers shall be in accordance with the AWS requirements for use in the specified Grades, and as follows:
   a. Wood veneers shall be FSC Certified.
   b. Veneers shall comply with HPVA DFV-1.
      1) Use Group B veneers for countertops and work surfaces.
      2) Use Group A or B veneers for all other surfaces.
   c. Species and cut shall be as scheduled in Section 09 06 00.
6. High-Pressure Decorative Laminate (HPDL): All plastic laminates shall meet the requirements of ANSI/NEMA LD 3 and ANSI A161.2 for high-pressure decorative laminates. Design, colors, surface finish and texture, and locations shall be as scheduled in Section 09 06 00. Plastic laminate types and nominal minimum thicknesses for casework components shall be as follows:
   a. Grade HGS for exposed horizontal surfaces not requiring post-forming
   b. Grade VGS for exposed vertical surfaces of casework components not requiring post-forming
   c. Grade HGP for exposed horizontal surfaces where post forming is required
   d. Grade VGP for exposed vertical surfaces where post-forming is required
   e. Grade CLS for semi-exposed surfaces
   f. Grade BKL for concealed surfaces
7. Edge Banding:
   a. At wood-veneer-faced casework, provide veneer edge bands of the same species and cut as the exposed surfaces.
   b. At plastic-laminate-clad casework, provide 3 mm PVC [plastic laminate] edge banding to match face laminate.
8. Adhesives:
   a. Use Type 1 water proof adhesives that do not contain added urea formaldehyde.
   b. VOC Content: Adhesives shall comply with the following limits when calculated according to SCAQMD Rule 1168:

1) Wood Glues: Not more than 30 g/L.
2) Contact Adhesive: Not more than 80 g/L.

2.03 HARDWARE

A. Wire Pulls: ANSI/BHMA A156.9, B52011, back mounted, 4 inches long and 5/16 inch in diameter

B. Drawer Slides: ANSI/BHMA A156.9, B05091, BHMA Certified
1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zinc-plated steel ball-bearing slides.
2. Grade 1HD-100 for drawers up to 8 inches deep by 24 inches wide.
3. Grade 1HD-200 for larger and vertical file drawers.

C. Hinges: Sizes: to fit door and panel thickness.
1. Institutional heavy-duty Concealed, 3D Clip-On, ANSI/BHMA 156.9 Grade 1, 3/16 inch steel, Aximat 200 and 300 Single Pivot, by Hafele American Co. Use Twin overlay hinge 334.06.902 where applicable. Matt nickel finish.

D. Catches: Magnetic catches, ANSI/BHMA A156.9, B03141.

E. Adjustable Shelf Standards and Supports: ANSI/BHMA A156.9, B04071; with shelf rests, B04081.

F. Locks: ANSI/BHMA A156.11, E07121 at doors and E07041 at drawers, BHMA Certified.
1. Key to match building keying system.
2. Keying: All keyways in same room or area alike.
3. BHMA Certified locks are not available for all keyways; non-certified products may be used only as required to coordinate with building keying.

G. Grommets for Cable Passage through Countertops: 2-inch (51-mm) OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.

H. Keyboard and Mouse Tray: Human Scale Model A115, Doug Mockett & Co Model KP1 with KP1A mouse support, or approved equal.

I. Wire Management: Doug Mockett & Co WM-2A, Blanton & Moore WMC-4000, or approved equal.

J. Support angle brackets for countertops: 18" brackets, steel angle 1/4" thick, 2" legs, mitered and welded, ground smooth, unless noted otherwise on drawings, install at 16" on center.

K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for finish number 630, Satin Stainless Steel, unless noted otherwise.

L. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

M. Provide additional types of hardware as detailed on the Drawings and as required for complete fabrication and installation.

2.04 FABRICATION

A. Casework shall be AWS CONSTRUCTION TYPE A, frameless and cabinet and door INTERFACE STYLE 1, overlay, unless indicated otherwise.

B. Exposed Surfaces shall be as scheduled in Section 09 06 00, and meeting the requirements of the AWS for the Grade specified.
   1. All surfaces visible from a seated or standing position, including interior surfaces of open casework, shelving, and casework with glass doors, to sloped tops and to tops up to 72 inches above floor or visible from an upper level, shall be considered Exposed.
   2. Shelving, horizontal surfaces and all surfaces behind sliding Markerboards shall be considered Exposed.
   3. Requirements for veneer-faced casework unless indicated otherwise:
      a. Veneers shall be taken from the same flitch, to be selected by the architect.
      b. Faces at cabinet doors, drawer fronts and false fronts shall be sequence matched, shall run and match vertically, and shall be sequence matched with adjacent wall paneling and/or doors.
      c. Faces at exposed ends of cabinets shall be selected from the same flitch, and shall be well matched to the adjacent paneling and to the cabinet fronts.
      d. All components including casework, paneling, doors, and trim shall be factory finished at the same time in the same facility.

C. Semi-Exposed Surfaces shall be in accordance with AWS requirements, except as otherwise specified herein.
   1. For wood-veneer-faced casework, semi-exposed surfaces shall be in accordance with AWS requirements, except as otherwise specified herein.
   2. For plastic-laminate-clad-casework, semi-exposed surfaces shall be Grade CLS HPDL.

D. Doors, drawer fronts, and false fronts shall be flush overlay unless indicated otherwise.

E. Back Splashes
   1. Back splashes shall be ASSEMBLY 2-Deck mount, manufacturer assembled.
   2. Back splashes shall be cove and shall be 4 inches high unless indicated otherwise.
   3. Back splash tops shall be square with scribe unless indicated otherwise

F. Countertop Edges
   1. Plastic-laminate-clad countertops: HPDL self edge unless indicated otherwise.

G. Miscellaneous Fabrications: Provide miscellaneous fabrications using materials specified herein as detailed on the Drawings, including, but not limited to, the following:

1. Built-in seating, benches, shelving, and other custom fixed furnishing fabrications.
2. Flush wood paneling.
3. Plastic-laminate-clad paneling.
4. Resin composite paneling - solid surfacing.
5. Resin composite paneling - quartz surfacing.

H. Factory Finishing
1. All wood-veneer-faced items provided in this Section shall be factory finished in accordance with AWS requirements for the Grade specified.
   a. Finish System for wood-veneer-faced cabinets: System - 9, UV Curable, Acrylated Epoxy, Polyester or Urethane; stain to match control samples.
   b. VOC Content: Finishes shall comply with the following limits when calculated according to SCAQMD Rule 1113: 275 g/L.

PART 3 - EXECUTION

3.01 PREPARATION

A. Before installation, condition casework to average prevailing humidity conditions in installation areas.

B. Before installing casework, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

C. Layout markings shall not be made with xylene-based inks, paint, or dyes, or with other solvent-based products that may bleed through finishes.

3.02 INSTALLATION

A. Grade: Install casework to comply with requirements for the same grade specified in Part 2 for fabrication of type of casework involved.

B. Assemble casework and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.

C. Install casework level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

D. Scribe and cut casework to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor casework to anchors or blocking built in or directly attached to substrates and in accordance to ASCE/SEI 7, Section 13.5, Table 13.5-1. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing screws for exposed fastening, countersunk and filled flush with casework and matching final finish if transparent finish is indicated.

F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
   1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
   2. Maintain veneer sequence matching of cabinets with transparent finish.
   3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

G. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
   1. Align adjacent special countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
   2. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
   3. Secure backsplashes to walls with adhesive and calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealers."

H. Miscellaneous Fabrications: Install wall paneling and miscellaneous fabrications as detailed on the Drawings.

I. Touch up finishing work specified in this Section after installation of casework. Fill nail holes with matching filler where exposed.

3.03 ADJUSTING AND CLEANING

A. Repair damaged and defective casework, where possible, to eliminate functional and visual defects; where not possible to repair, replace casework. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean casework on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION

SECTION 06 61 16

SOLID POLYMER FABRICATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cast acrylic polymer countertops.

B. Related Sections
1. Section 06 41 00, Casework.
2. Section 09 06 00, Schedules for Finishes.

1.02 REFERENCES

A. ADA - Americans with Disabilities Act of 1990 as amended
1. ADA/Standards - ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.

B. CBC - 2013 California Building Code
1. CBC-11 - CBC Chapter 11B, Accessibility to Public Buildings, Public Accommodations, Commercial Facilities and Publicly Funded Housing
2. CBC-16 - CBC Chapter 16A, Structural Requirements.

C. ASTM E84 - Surface burning characteristics of building materials.

D. ASTM D638 - Tensile Properties of Plastics.

E. ASTM D785 - Rockwell Hardness of Plastics and Electrical Insulating Materials.

F. SCAQMD - South Coast Air Quality Management District Regulations Rule 1168 Adhesive and Sealant Applications.

G. SDAPCD - San Diego County Air Pollution Control District, Regulation IV.

1.03 SUBMITTALS

A. Shop Drawings: Indicate dimensions, thickness, required clearances, tolerances, materials, colors, finishes, fabrication details, field jointing, adjacent construction, mounting methods, integration of components and anchorages.

B. Product Data: Provide data on specified component products.

C. Three samples illustrating color, textures and finishes, 6” x 6” each.

D. Manufacturer's Installation Instructions: Indicate preparation of opening required with rough-in sizes. Provide templates for cast-in or placed frames or anchors.

E. Maintenance Data: Indicate list of approved cleaning materials and procedures required and provide list of substances that are harmful to product. Include instructions for stain removal and surface.

1.04 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing this product as specified with minimum three years experience.

1.05 FIRE RESISTANCE REQUIREMENTS

A. Flame Spread: Less that 25, smoke density less than 450, ASTM E84.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install components when site conditions may be detrimental to product or curing.

1.07 QUALITY ASSURANCE

A. Mockups: build mockup of each type of Solid Polymer Fabrication.

B. Approved mockups may become part of the completed work if undisturbed at time of Substantial Completion.

1.08 FIELD MEASUREMENTS

A. Verify field measurements as indicated on shop drawings.

1.09 WARRANTY

A. Warrants product for a period of 1 year to repair or replace for products that fail in material or workmanship.

1.10 SEQUENCING

A. Sequence work to permit installation of adjacent affected construction, plumbing [and electrical] rough-in.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
1. Dupont Company, Wilmington, DE; Product: CORIAN.

B. Or equal as approved in accordance with Division 01 for substitutions.

2.02 MATERIALS

A. Corian: Homogenous, mineral-filled acrylic polymer, solid, non-porous with full depth color pattern, conforming to following:

1. Tensile Strength, ASTM D638: Minimum 4000 pounds per square foot.
2. Elongation, ASTM D638: 0.3 percent Maximum
3. Hardness, ASTM D785: 90 Rockwell M
4. Weight per square foot, 3/4 inch thick: 7 lbs. (Approximate)
5. Integral Sinks: [No. 804, 15-3/4Wx 15-3/4L x 8-1/8 D] [No. 805: 15-3/4W x 17-3/4L x 8-1/8 D] [No: 871: 21W x 15-3/4L x 7-3/8 D] inches, inside dim. Mounting method: Seamed undermount.

B. Adhesive: Neoprene-based panel adhesive or Type I solvent-based mastic type, approved for use by materials manufacturer. At joints, use manufacturers joint adhesive, color matched to material.

C. Sealant: Silicone type specified in Section 07 92 00 and approved by manufacturer.

D. Cleaner: type recommended by manufacturer.

E. Fasteners: use screws designed specifically for plastics. Self-threading screws acceptable for permanent installation. Provide threaded metal inserts for applications requiring frequent disassembly.

2.03 FABRICATION

A. Fabricate components by mold to achieve required shape and configuration. Comply with manufacturer written recommendations for fabrication.

B. Fabricate in shop to greatest completion possible.

C. Square edges, and square inside corners, eased.

D. Cure components before shipment, except sheet materials requiring site handling.

2.04 FINISH

A. Exposed to View Surface Texture: Semi-gloss .

B. Orientation: Horizontal

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions are complete and ready to receive work of this Section.

B. Verify that joint preparation, substrates and affected dimensions are acceptable to manufacturer.

3.02 PREPARATION

A. Provide anchoring devices for installation and embedment.

B. Provide templates and rough-in measurements.

3.03 INSTALLATION

A. Install components, sinks according to shop drawings and manufacturers instructions.

B. Align Work plumb and level. Form joints using manufacturer's recommended procedures. Panel seams should not align with substrate seams.

C. Rigidly anchor to substrate to prevent misalignment. Utilize fasteners, adhesives and bonding agents as recommended by the manufacturer. Materials damaged as a result of installation or fabrication methods will not be accepted.

3.04 TOLERANCES

A. Maximum Variation From True Dimension: 1/8 inch.

B. Maximum Offset From True Position: 1/8 inch.

3.05 CLEANING

A. Clean and polish fabrications according to manufacturer's instructions.

3.06 PROTECTION OF FINISHED WORK

A. Protect finished work until Date of Substantial Completion.

B. Do not permit construction near unprotected surfaces.

END OF SECTION

SECTION 07 21 00

INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Sound attenuation insulation in interior partition construction.

B. Related Requirements:
   1. Energy calculations or prescriptive compliance documents.

1.02 REFERENCES

A. ASTM - American Society for Testing and Materials
   1. ASTM C 1104 - Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation
   2. ASTM C 1338 - Test Method for Determining Fungi Resistance of Insulation Materials and Facings
   3. ASTM D 816 - Rubber Cements
   4. ASTM E 84 - Surface Burning Characteristics of Building Materials
   5. ASTM E 96 - Test Methods for Water Vapor Transmission of Materials
   6. ASTM E 136 - Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

B. CBC - 2013 California Building Code
   1. CBC-7 - CBC Chapter 7, Fire and Smoke Protection Features.

C. Title 24 California Code of Regulations Part 6 California Energy Code, Section 118, 2013 .

D. SCAQMD - South Coast Air Quality Management District Regulations Rule 1168 Adhesive and Sealant Applications.

1.03 PERFORMANCE REQUIREMENTS

A. Materials shall provide continuity of sound barrier at designated room enclosure elements.

B. Materials shall conform to Section 720 California Building Code and Section 118 California Energy Code.

1.04 SUBMITTALS

A. Product Data: Provide data on product characteristics, performance criteria and methods of installation.

B. Three samples of each material specified minimum 12 inches square. Provide fasteners, clips and other accessories.

C. Certification of Compliance with Section 118 California Energy Code, 2013 and Part 12, Title 24,CCR Standards for Insulating Materials Chapter 12-13, Section 12-13-1555.

1.05 QUALITY ASSURANCE

A. Provide R-value in accordance with Section 143, Table 143-A of 2013 California Energy Code, Title 24 Part 6 California Code of Regulations.

B. Adhesives shall comply with VOC content limits defined by SCAQMD Rule 1168.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
   1. Johns Manville Insulations, Commercial/Industrial Division, Denver, CO.
   2. Certainteed Corporation, Valley Forge, PA.
   3. Owens - Corning, Toledo, OH.
   4. Thermafiber Division of USG Corp., Wabash, IN.

B. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.02 MATERIALS - SOUND

A. Sound Attenuation Insulation: ASTM C665, Type I; preformed glass fiber, formaldehyde-free, “Sound Control Batts”, acoustical fiber glass insulation, by Johns Manville or equal. Conforming to the following:
   1. Size: As required to fully fill cavity width and height.
   2. Thickness:
      a. 3-5/8” for 4” walls and 6-1/2” for 6” walls, minimum.
      b. 10” thick between floors.
   3. Facing: Unfaced.
   4. Flame Spread: Less than 25, ASTM E84.
   5. Smoke Developed Rating: Maximum 50.
   6. Formaldehyde-free.
   7. Recycled Content: Minimum 25 percent.

2.03 ACCESSORIES

A. Fasteners, type and size to suit application.

B. Adhesive: Tuff Bond Hanger Adhesive manufactured by Gemco, Dansville, OH, or equal as approved in accordance with Division 01, General Requirements for Substitutions.

C. String wire: Minimum 16 gauge galvanized annealed steel wire spaced at 18” on center.

D. Do not use salvage cut-offs, materials less than space width, or in multiple short lengths to fill-in the gaps.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify site conditions.

B. Verify that substrate and adjacent materials are satisfactorily installed and in place and are ready to receive insulation.

3.02 INSTALLATION

A. Install insulation in accordance with insulation manufacturer's instructions.
   1. Clean tracks prior to installation.

B. Install in cavities designated to receive sound without gaps or voids. Extend material full height of cavity.

C. Cut insulation to fit tightly at cavities between studs not standard 16 inches on center spacing.

D. Trim insulation neatly to fit spaces.

E. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids.

F. Extend thermal materials full height of cavity to structure above and as otherwise required to produce a completely insulated building envelope.

G. Extend sound materials full height of cavity to structure above and as otherwise required to produce a completely sound insulated enclosure.

H. Install material to preclude slipping from place by use of nails, screws, wires or other approved fastening devices.

I. In wall cavities above ceilings with no finish or finish on one side, retain insulation in place with 16-gauge galvanized annealed wires spaced 12 inches on centers vertically.

J. Where tight, congested, difficult or otherwise unforeseen conditions are encountered, employ alternate application methods or materials to effect the intended insulation system. Alternate methods or materials shall be submitted to Architect for review and approval..

3.03 INSPECTION

A. Notify Project Inspector before Work is covered. Approval by Project Inspector shall be received before any Work is concealed. Work that has been covered prior to inspection and approval shall be uncovered for inspection and recovered.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Preparing substrate surfaces.

B. Sealant and joint backing.

1.02 REFERENCE

A. ASTM C834 - Latex Sealing Compounds.

B. ASTM C881 - Epoxy-Resin Base Bonding Systems for Concrete.

C. ASTM C919 - Use of Sealants in Acoustical Applications.

D. ASTM C920 - Elastomeric Joint Sealants.

E. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.

F. ASTM C1184 - Structural Silicone Sealant.

G. ASTM C1193 - Standard Guide for Use of Joint Sealants.

H. ASTM C1311 - Solvent Release Sealants. Butyl and acrylic base polymer.

I. ASTM C1330 - Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.

J. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification (www.SWRIONLINE.org).

K. GANA: Glass Association of North America Sealant Manual, 2008.

L. SDAPCD — San Diego County Air Pollution Control District, Regulation IV.

1.03 SUBMITTALS

A. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

B. Manufacturer’s installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with sealant manufacturer’s requirements for preparation of surfaces and material installation instructions.

B. Perform acoustical sealant application work in accordance with ASTM C919.

C. Prepare sample joints in the construction to demonstrate to the Architect the quality of the Work to be performed. Accepted sample joints will be used to judge the quality of the Work.

D. Qualifications
   1. Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum three years experience.
   2. Applicator:
      a. Pre-qualified applicator specializing in performing Work of this Section with minimum three years experience and approved by manufacturer.
      b. This applicator shall be licensed joint sealing specialty Contractor.
      c. Submit list of completed local projects of similar sealant applications.

E. Comply with Air Quality regulations, California Regulations:
   1. SCAQMD Rule 1168 compliant VOC limit of 250.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.06 COORDINATION

A. Coordinate the Work with all Sections referencing this Section.

1.07 WARRANTY

A. Provide five-year product warranty, submit under provisions of Division 01, General Requirements.

B. Warranty: Include coverage for installed sealants and accessories which fail to achieve air tight seal, water tight seal, exhibit loss of adhesion or cohesion, or do not cure.

C. Upon written notification of failure due to defective materials or application, repair or replace failure to the approval of the Architect and at no cost to Owner.

PART 2 - PRODUCTS

2.01 SEALANT AND MATERIAL MANUFACTURERS

A. Following is list of acceptable manufacturers of sealants and sealant materials. Inclusion in this list is not intended to imply that all manufacturers make all products. Products made by listed manufacturers must comply with all specified requirements.
   1. Bostik Construction Products.
   2. Dow Corning Corporation (www.dowcorning.com/construction)
   3. Sika Corporation.
   4. General Electric Company.
   5. W.R. Meadows, Inc.

6. Pecora Corporation.
7. Mameco International.
8. Tremco/Vulkem.
9. Sonneborn, ChemRex Inc.
10. Hilti
11. 3M Company
12. Substitutions: Under provisions of Division 01, General Requirements.

2.02 SEALANT TYPES

A. Single-Component Urethane: ASTM C 920, Type S, Grade NS, Class 35, Use NT, A, M, and O; USDA and FDA status.

B. Single-Component Urethane (Self-Leveling): ASTM C 920, Type S, Grade P, Class 35, Use T, A, M.

C. Multi-Component Urethane (Gun-Grade): ASTM C 920, Type M, Grade NS, Class 35, Use NT, A, M, and O.

D. Multi-Component Polyurethane (Gun-Grade): ASTM C 920, Type M, Grade NS, Class 35, Use T, A, M, and O.

E. Multi-Component Urethane (Self-Leveling): ASTM C 920, Type M, Grade P, Class 25, Use T, A, M, and O.

F. Single-component sealant, Silicone (Neutral-curing): ASTM C 920, Type S, Grade NS, Class 35, Use NT, G, A, M, and O; USDA, NSF and FDA 21 CFR 177.2600 approved.

G. Single-component sealant, Silicone (Neutral-curing,): ASTM C 920, Type S, Class 100/50, Grade P, Use T, and O.

H. Single-component, modified silicone polymer (silyl-terminated polyether resin - STPe), elastomeric sealant with plus-100-percent to minus-50-percent movement and complying with ASTM C-920, Type S, Grade NS, Uses NT, G, M, A, and O.
   1. Acceptable Product: BASF, Sonolastic 150 Tint Base, or equal. Color shall be as selected by the Architect from the manufacturer's full range of available colors.

I. Acrylic-Latex Caulk: ASTM C 834, Type OP or C, Grade 18 deg. C.

J. Bedding Compound: For installation of thresholds and similar items indicated to be bedded in sealant, use a preformed butyl-polyisobutylene sealant tape. Size of tape as required for the specific application.

K. Adhesives: Type that complies with Mil. Spec. MIL-A-46146
   1. Product: Dow Corning 3145 Silicone Adhesive
   2. Color: Clear or Translucent.
   3. Peel Strength: 75

L. Acoustical Sealant – gunnable type, non-drying, non-hardening permanently flexible, ASTM C919, ASTM C834, ASTM C920.
   1. Manufacturers: Tremco Acoustical Sealant, U.S. Gypsum Sheetrock Acoustical Sealant, Pecora Corp. BA-98 or equal.

M. Butyl Sealants: Butyl rubber sealant, BC-158 by Pecora or equal in compliance with VOC regulations of local Air Quality Districts.

N. Insulating Foam Sealants: two component polyurethane foam and dispensing kit, commercial grade, UL Classified, for professional application. "Froth-Pak" Foam Sealant by Dow Chemical, or equal. *** Similar to “Great Stuff-Pro• by Dow****

2.03 JOINT AND SURFACE TYPES

A. Pedestrian and Vehicle Traffic Joints - Provide one of the following for each joint type:
   1. Multi-component urethane (self-leveling)
   2. Single-component urethane (self-leveling)
   3. Single-component sealant, silicone (neutral curing)

B. Non-Traffic Deck Joints - Provide one of the following for each joint type:
   1. Multi-component urethane (gun-grade)
   2. Single-component urethane
   3. Single-component sealant, silicone

C. Concrete Surfaces exceeding 20 square feet.
   1. Single-Component Silicone (Neutral-curing,): ASTM C 920 Class 25, Type S, Grade P, Use T, and O (self-leveling).

D. Vertical Joints - Provide one of the following for each joint type:
   1. Multi-component urethane (gun-grade)
   2. Single-component sealant, silicone (neutral cure)

E. Expansion, Control, and Perimeter Joints - Provide one of the following for each joint type:
   1. Multi-component urethane (self-leveling)
   2. Single-component urethane; use only where dynamic movement will not exceed 50 percent of joint width - above or below grade
   3. Single-component urethane (self-leveling)
   4. Single-component sealant, silicone.

F. Glazing - Provide one of the following for each joint type:
   1. Single-component sealant, silicone (neutral-curing).
   2. Structural silicone sealant for Structural Glazing.

G. Acoustical Sealant – gunnable, provide the following:
   1. Non-drying, non-hardening, non-skinning sealant type, ASTM C919.
   2. Acrylic-latex caulk, Type OP opaque or Type C clear at visual locations, ASTM C834.
   3. Chemically curing Sealant, for interior sound reduction application, ASTM C920.

H. Exterior Doors and Windows: Sealant used for exterior joints or butyl rubber.

1. Fire-rated sealant at fire-rated assemblies per Section 07 84 00.

I. Interior Doors and Windows - Provide one of the following for each joint type:
   1. Single-component sealant, silicone (neutral cure)
   2. Fire-rated sealant at fire-rated assemblies per Section 07 84 00.

J. Built-In Cabinet Work: In kitchen, toilet, and bath areas, as specified for those areas. In other areas, single-component silicone (neutral-curing) or acrylic-latex caulk.

K. Miscellaneous locations: Butyl rubber at all gaps, holes, openings, under wood sills, penetrations or channel metal track in exterior envelope of building not identified herein. Install as directed by the Architect.
   1. Seal all cutouts and penetrations: For electrical, mechanical, plumbing and structural framing cutouts and penetration at interior surfaces with acoustical sealant and fire-rated sealant for rated walls per section 07 84 00, or butyl rubber for exterior surfaces including walls.

2.04 SEALANT COLORS

A. Provide materials matching colors indicated or if no color is indicated, matching the color samples selected from those submitted to the Architect.
   1. Sealant between walls and door, window, and louver frames to match adjacent wall color.

2.05 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing Rod: ASTM C1330 Class C, closed cell polyethylene cylindrical backer rod; oversized 30 to 50 percent larger than joint width, Green Rod by Nomaco Inc., Zebulon, NC, Backer Rod Mfg. Denver, CO or equal.

D. Elastomeric Tubing Sealant Backing: ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.

E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

F. Filler: Mineral fiber board; ASTM C612, Class1, thickness same as joint, depth to fill void completely behind backer-up rod.

G. Tape Sealants: pressure sensitive, 100% solid, sealing tape with a release paper backing. Provide permanent elastic, non-sagging, non-toxic, non-staining tape sealant. Schnee-Morehead Inc. “Tacky Tape” SM5227, 3/32” or 1/2” wide x 3/8” thick x 45’ long, or equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive Work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

A. Remove loose materials and foreign matter which might impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions.

D. Protect elements surrounding the Work of this Section from damage or disfiguration.

E. At deep joints install filler material to fill space behind the back-up rod and position the rod at proper depth.

3.03 INSTALLATION

A. Do not proceed with sealant Work until the sample joints specified in Part 1 of this Section have been prepared and accepted by the Architect.

B. Install sealant in accordance with manufacturer's instructions and ASTM C1193.

C. Apply sealant per ASTM C919 at gypsum board framed sound walls, side of runners in metal framing and miscellaneous openings and cutouts.

D. Measure joint dimensions and size materials to achieve required 2:1 width/depth ratios.

E. Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.

F. Install bond breaker where joint backing is not used.

G. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

H. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

I. Tool joints concave unless detailed otherwise.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Division 01, General Requirements.

B. Protect sealants until cured.

END OF SECTION

SECTION 08 12 13

HOLLOW METAL FRAMES – WELDED

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Non-rated Welded steel frames for doors .

B. Related Sections
   1. Section 06 20 00, Finish Carpentry – Installation of Doors.

1.02 REFERENCES

A. SDI - Steel Door Institute.
   1. SDI 100 - Recommended Specifications for Standard Steel Doors and Frames, Latest Edition.
   2. SDI 111 - Recommended Standard Details Steel Doors and Frames.
   3. SDI 117 - Manufacturing Tolerances Standard Steel Doors and Frames.

B. ANSI - American National Standards Institute
   1. ANSI A224.1 - Standard Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
   2. ANSI A250.4 and A450.5 - Test Procedure / Acceptance Criteria for Physical Conformance.
   3. ANSI A250.6- Hardware on Steel Doors (Reinforcement Applications).
   4. ANSI A250.8/SDI-100 - Recommended Specifications for Standard Steel Doors and Frames, Latest Edition.
   5. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Steel Surfaces for Steel Doors and Frames.
   6. ANSI A250.11/SDI-105 - Recommended Erection Instructions for Steel Frames.

C. ASTM - American Society for Testing and Materials
   1. ASTM A653/A653M- Sheet Steel, Zinc-Coated (Galvanized) or Zinc - Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   2. ASTM A924/A924M – General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
   3. ASTM A1008/A1008M - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
   4. ASTM D6386 – Preparation of Hot-Dipped Galvanized Coated Iron and Steel and Hardware Surfaces for Painting.

D. ADA - Americans with Disabilities Act of 1990, as amended.
   1. ADA Standards – ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.

E. CBC - 2013 California Building Code.

F. CRSC - California Referenced Standards Code (CCR Title 24, Part 12)

1. CRSC-7A.2 - Standard 12-7A-2, Exterior Windows
2. CRSC-7A.4 - Standard 12-7A-4 Fire Resistive Standards, Fire Door Assemble Tests
3. CRSC-10.2 - Standard 12-10-2 Single Point Latching or Locking Devices
4. CRSC-10.3 - Standard 12-10-3 Emergency Exit and Panic Hardware

1.03 SUBMITTALS

A. Shop drawings indicating frame configuration, anchor types and spacing, location of cutouts for hardware, reinforcement and finish.

B. Product data.

C. Manufacturer's installation instructions.

D. Job Closeout: provide one complete manufacturer’s catalog to Owner’s lock shop or Authorized Representative.

1.04 QUALITY ASSURANCE

A. Manufacture frames to conform to SDI standards except where exceeded by this Specification.

B. Comply with ANSI/SDI A250.4 Level A, one million cycle swing test performance for 3070 door frames.

C. Manufacturer: Company specializing in manufacturing products specified in this Section having minimum five (5) years experience.

D. Installer: Firm with minimum five (5) years experience in installation of metal doors and frames.

1.05 DELIVERY, STORAGE AND PROTECTION

A. Deliver and protect frames with manufacturer's shipping safeguards.

B. Attach spreader bars on welded frames to preclude warping or bending during delivery and storage.

C. Storage: Store in dry secure location. Place units on minimum 4 inch high wood blocking. Avoid non-vented plastic or canvas shelters. Provide 1/4 inch wide spaces between stacked units.

1.06 WARRANTY

A. One-year warranty against defects in materials and workmanship. Warranty to commence at Date of Certified Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
   1. Ceco Door, Milan, TN.
   2. Curries Company, Mason City, IA.
   3. Door Components, Inc., Fontana, CA.
   4. Mesker Doors, Huntsville, AL.
   5. Republic Doors and Frames, McKenzie, TN.
   6. SteelCraft, an Allegion Brand, Dublin, Ireland.

B. Or equal in accordance with Division 01, General Requirements for Substitutions.

2.02 WELDED FRAMES

A. Type: Standard frames Transom frames with integral stop and flat trim, double rabbet, profiles as indicated on Drawings, cold rolled steel, Commercial Steel, ASTM A1008/A1008M, galvanized steel ASTM A653 and ASTMA924 for exterior applications. Minimum: 16 gauge.
   1. Drywall: Provide backbend returns.
   2. Plaster: Keyed-in-frame backbends.

B. Anchors: Provide two anchors at head for openings up to 48 inches, three if wider, maximum 30 inches on centers. Provide three at jamb for doors up to 84 inches in height, additional anchors at maximum 30 inches on centers for higher doors.
   1. Provide appropriate type of anchors consistent with type of wall construction for each installation and in conformance with SDI 111 and ANSI 250.11.
   2. Masonry Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c.
   3. Masonry Type: 16 gauge T-shaped anchors to suit frame size, not less than 16 gauge thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; minimum 3 per jamb.

C. Floor Attachment: Provide adjustable base anchor with extension for expansion anchor attachment to concrete floor. Extension factory welded. Minimum thickness: 14 gauge.
   1. Wedge Type: KWIK Bolt TZ, 3/8 to 3/4 inch diameter, ICC ESR-1917, by Hilti Inc., Tulsa, OK.
   2. Monolithic Concrete Slabs: Clip-type anchors, with holes to receive fasteners.

D. Hardware Attachment: Mortise, reinforce, drill and tap at factory to receive specified hardware. Install minimum 10 gauge reinforcing welded to frame for surface mounted hardware, except install 7 gauge reinforcing for hinges. Tap to templates.
   1. Install reinforcing for closers, both sides of frames, on all frames, single and pairs, labeled and non-labeled.
   2. Use 10 Gauge reinforcing for locks, panics, closers, and hold-open arms.

E. Silencers: Make provision for minimum three rubber silencers at strike jamb of all doors except fire-rated doors, and one at head of each leaf of double doors, except fire-rated doors.

2.03 PROTECTIVE COATINGS

A. Interior Frames:
   1. Metallic coating protection not required.
   2. Pretreat and shop prime, air-dried, conforming to ANSI A250.10. Approved Primer: Series 18 Enviro Prime @ 2-4 mils DFT Gray, by Tnemec or equal.
   3. Finish paint frames under Section 09 90 00 Painting, colors per Section 09 06 00.

B. On surfaces where metallic coating has been damaged or removed during fabrication, frames shall be touched-up with factory-applied primer.

2.04 FABRICATION

A. Fabricate interior welded steel door frames as machine-mitered face-welded unit type. Weld and grind smooth.

B. Where cross mullions or T intersections occur, frames shall be fabricated as butted and face-welded assembly joints. At mullion-to-base intersections extend mullion to floor and face weld. Where butted joints are exposed to weather, seal intersection as specified in Section 07 92 00.
   1. At window frames apply minimum 5/8 inch high, 16 gauge channel stops. Attach with flat head machine screws, countersunk, tamper-proof type where exposed to weather.

C. Machine mitered faces and butt-joined integral stops permitted with continuous welds.

D. Fabricate frames with hardware reinforcement plates welded in place.

E. Fabricate frames to accept anchors as described in SDI-111 for type of wall construction.

F. Reinforce frames for door closers on both sides of frames.

G. Apply primer to all surfaces of frames, in accordance with requirements of ANSI A250.10. Metallic-coated protected surfaces shall be pretreated prior to application of primer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install frames in accordance with ANSI A250.11/SDI-105.
   1. Installation of jamb anchors to steel framing: weld to studs.
   2. Install Floor anchors, 1 clip angle per jamb with expansion wedge type anchor.
   3. Install T-shaped anchors. Grout frame in the area of the anchors as block courses are laid up.
   4. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

B. Install insulation behind frames.

C. Coordinate anchor placement with type of wall construction.

D. Paint frames under Section 09 90 00, Painting.

3.02 TOLERANCES

A. Conform to standard of tolerances as required in SDI-117.

END OF SECTION

SECTION 08 14 16

FLUSH WOOD DOORS

PART 1 - GENERAL

A. SECTION INCLUDES

B. Wood doors, non-rated.

1.02 REFERENCES

A. ANSI A208.1 - American National Standard -Particleboard.

B. WDMA I.S.1A-(Latest Edition) - Window and Door Manufacturers Association.

C. Chapter 7 and 10, 2013 California Building Code.

D. ADA - Americans with Disabilities Act of 1990, as amended.
   1. ADA Standards – ADA Title II Regulations and the 2013 ADA Standards for Accessible Design.

E. WI - Architectural Woodwork Standards (AWS), Woodwork Institute, Latest Edition.

F. CBC - 2013 California Building Code
   1. CBC-10 – CBC Chapter 10, Means of Egress
   2. CBC-11 – CBC Chapter 11B, Accessibility to Public Buildings, Public Accommodations, Commercial Facilities and Publicly Funded Housing

G. CRSC - California Referenced Standards Code (CCR Title 24, Part 12)
   1. CRSC-7A.2 - Standard 12-7A-2, Exterior Windows
   2. CRSC-7A.4 - Standard 12-7A-4 Fire Resistive Standards, Fire Door Assemble Tests
   3. CRSC-10.2 - Standard 12-10-2 Single Point Latching or Locking Devices
   4. CRSC-10.3 - Standard 12-10-3 Emergency Exit and Panic Hardware

H. WH - Warnock-Hersey Laboratory

I. ITS-WH – Intertek Testing Services-Warnock-Hersey.

1.03 SUBMITTALS

A. Shop drawings indicating door elevations, types, hand, thickness, stile and rail reinforcement, internal blocking for hardware attachment and cutouts.

B. Product data.

C. Three samples, 12 x 12 inches , of each door type specified, illustrating each face veneer specified. Samples shall illustrate core material and finish choice.

D. Manufacturer's installation instructions.

E. Certificate of Compliance for fire-rated doors.

1.04 QUALITY ASSURANCE

A. Provide doors from one manufacturer only.

B. Doors shall be manufactured in accordance with Section 12 of the Latest edition of the Architectural Woodwork Standards (AWS) of the Woodwork Institute for Premium Grade, Hot Press 5-Ply construction, bonded construction, or to higher standards as specified herein.

C. Before delivery to jobsite, door supplier shall submit WI Certified Compliance Certificate, countersigned by manufacturer, indicating products he will furnish for this job and certifying that they will fully meet requirements of grade or grades specified.

D. First page of shop drawings shall bear WI Certified Compliance Label. Shop drawings not conforming to this requirement will be rejected.

E. One (1) copy of latest issue of WI Architectural Woodworks Standards (AWS) shall be made available for reference at jobsite throughout installation period.

F. Upon completion, WI Certified Compliance Certificate, countersigned by manufacturer, shall be submitted.

G. Regulatory Requirements
1. Conform to CBC-2013 California Building Code, Sections 715 and 1004.3.4.3.2.1, for fire-rated doors.

1.05 DELIVERY, STORAGE AND PROTECTION

A. Protect doors with resilient packaging, sealed with heat shrunk plastic or other manufacturer's shipping safeguards.

B. Package, deliver and store doors in accordance with WI requirements.
1. Store in dry, broom-clean area.
2. Protect materials from damage.
3. Replace units damaged, warped or otherwise not usable.

C. Exposed wood at tops, bottoms and cutouts for hardware and accessories: Seal prior to shipment.

1.06 WARRANTY

A. Provide documentation under provisions of Division 01, General Requirements.

B. Provide Life-of-Original-Installation Warranty for solid core interior doors.
1. Warranty shall state that doors will not warp, twist, bend, shrink, the veneers buckle or delaminate, or the joints open for the warranty period. Any door of 25 square feet or larger may have a warp or twist of not more than 1/4 inch in eight feet. Any door that develops defects within the scope of the warranty shall be replaced with a new door without expense to the Owner.

2. During the first year of warranty, replacement doors shall be delivered to the Contractor for installation.
3. During the succeeding years of the warranty, replacement doors shall be delivered to the building in which defective door is located. Bill of lading shall indicate the name of the building and room or location where door is to be replaced. Warranty shall include cost of removal of defective unit, installation of replacement and finishing.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
1. Eggers Industries, Two Rivers, WI.
2. VTI Industries, Holstein, IA.
3. Algoma Architectural Doors, Algoma, WI.
4. Oshkosh Door Company, Oshkosh, WI.
5. Haley Bros., Inc., Buena Park, CA.
6. Graham Wood Doors, Mason City, IA.
7. ABS Manufacturing, Stockton, CA.
8. Western Oregon Door, Winston, OR.

B. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.02 DOOR CONSTRUCTION TYPES

A. Particle Board Core PC-5 (Non-Fire-Rated)
1. Thickness: 1-3/4 inch.
2. Face:
a. Transparent Finish:
1) Grade: Premium, Grade “AA• faces .
2) Face: wood veneer, species; Select White Birch hardwood veneer, sapwood.
3) Cut: plain sliced.
4) Matching: balance book match for leaf matching.
5) Pair Match: Balance Match for doors in pairs.
6) Set Match: Balance Match for doors in sets.
3. Crossband: Hardwood veneer or engineered high-density fiberboard, 1/16 inch thick.
4. Stiles: Two-ply, 1-1/2 inch laminated hardwood outer strip, species at mill option, bonded to core. Stiles same species at transparent finish.
5. Top and Bottom rails: 1-1/8 inch hardwood or softwood mill option, bonded to core.
6. Face Assembly Adhesive: Type I, waterproof.
7. Core Assembly Adhesive: Type II, water-resistant.
8. Core: Particleboard, 28 lb. low density, ANSI A208.1, Table A, Grade LD-2.
9. Moisture Stripping: Sealed edges.
10. Acoustical rating: 31 STC

11. Blocking for Hardware: Flame resistant, 6 inch top edge for closers, 5.5 inches for bottom hardware or automatic closers where applicable, 5 x 18 inch lock blocks, 5.5 inch cross blocking for panic hardware, 5 x 12 inch for floor closers or pivot hinges where applicable.
12. Performance Rating: Extra Heavy Duty.

B. Pair of doors in exits: Minimum width of doors, 32 inches, to allow a clear unobstructed opening of 32 inches in width when door is positioned at an angle of 90 degrees from its closed position.

2.03 FABRICATION

A. Fabricate non-rated doors in accordance with WI Quality Standards and WDMA I.S.1-A.

B. Medium density overlay shall be readily sandable. Hardboard surface material not permitted.

C. Only five-ply hot-press construction is permitted .

D. Veneer: Face veneer grain shall run vertically; crossband veneer run horizontally.

E. Transom Panels: Same construction as doors. For transparent finish: continuous match.

2.04 FACTORY FINISH

A. Factory Finish: Premium finish, meet or exceed performance standards of System 5, Catalyzed Polyurethane. Factory-finished doors shall be installed just prior to Substantial Completion.
1. Natural finish: Marshfield Door Systems No. Clear 0-95 Specified in Section 09 06 00

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install doors under Section 06 20 00.

3.02 INSTALLATION OF HARDWARE

A. Install hardware in accordance with manufacturer's instructions.

B. Use the templates and fasteners provided by hardware item manufacturer.

C. Mounting heights for hardware:
1. Locksets: 40-5/16 inches from floor to centerline of lever handle, hand operated opener or exit hardware, unless noted otherwise.
2. Butts: 5 inches from head of opening to top of top butt; 10 inches from finish floor to bottom of bottom butt; intermediate butt spaced equidistant between top and bottom butts.

D. After fitting hardware to doors which are scheduled for field painting and sealing of cutouts, remove all finish hardware, carefully replace in properly marked boxes, and place in storage until painting and finishing is completed. After painting and finishing is completed, permanently install finish hardware.

E. Secure finish hardware with suitable fasteners of the same material and finish as the item being attached.

F. Provide expansion anchors for attaching hardware items to concrete or masonry.

G. Mount exit devices and closers with closed head sex bolts.

H. Cutouts for hardware in wood doors having a fire rating of 45 minutes or more shall be accomplished at the factory before labels are affixed. As an alternative, said fire rated doors may be machined at the jobsite by a Warnock-Hersey authorized representative, when authorized in writing by the Architect and when such doors are affixed with an identification sticker at the factory stating the door is eligible to receive the designated fire rating.

I. Conform to SDI-107 and SDI-109 for hardware on steel doors.

3.03 INSTALLATION TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge corner to corner, or as required to meet door warranty.

B. Adjust for smooth and balanced door movement.

3.04 FINISHING

A. Field Finishing: In accordance with Section 09 90 00, Painting.

END OF SECTION

SECTION 08 31 13

ACCESS DOORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fire-rated and non-rated access doors and frames in walls and ceilings.

B. Related Sections
   1. Section 09 90 00, Painting: Field paint finish.
   2. Division 23 - Mechanical: Locations and requirements for access doors.
   3. Division 26 - Electrical: Locations and requirements for access doors.

1.02 REFERENCES

A. UL - Underwriter's Laboratories.

B. WH - Warnock Hersey.

C. NAAMM - National Association of Architectural Metal Manufacturers

1.03 SUBMITTALS

A. Shop Drawings: Indicate exact positions of all access units.

B. Product data including sizes, types, finishes, scheduled locations and details of adjoining Work.

C. Manufacturer's installation instructions.

1.04 QUALITY ASSURANCE

A. Manufacture fire-rated access doors and frames to conform to UL or WH requirements.

B. Provide labels indicating rating.

1.05 COORDINATION

A. Coordinate Work and locations with mechanical and electrical work requiring access units.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
   1. Milcor Incorporated; Holland, OH.

2. The Bilco Company, New Haven, CT.
3. Karp Associates, Inc.; Maspeth, NY.
4. JL Industries Incorporated; Bloomington, MN.
5. Larsen's Manufacturing Company; Minneapolis, MN.
6. Nystrom Building Products; Minneapolis, MN.
7. Williams Brothers Corporation of America; Reno, NV.

B. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.02 FABRICATION

A. Fabricate components so as to be straight, square, flat and in same plane where required. Slightly round exposed edges and provide access without burrs, snags and sharp edges. Size: Minimum of 24 inches by 30 inches, unless otherwise shown or noted on mechanical or electrical Drawings or specified herein.

B. Weld continuous, fill and grind joints smooth to assure flush and square unit.

C. Hardware: 175 degree steel hinges with removable pin.

D. Number of locks and non-continuous hinges shall be as required to maintain alignment of panel with frame.

E. Provide anchors or make provisions in frame for anchoring to adjacent construction. Provide size, number and location of anchors as required to secure access door in opening.

2.03 ACCESS DOORS, FIRE RATED

A. Universal FIRE-RATED DOOR, style Milcor UFR prime painted stainless steel with concealed hinges, size 24 inch x 30 inch, with 1-1/2 hour label fire rating, automatic closing device.

B. Door Panel: Form of minimum 20 gauge thick steel sheet [**stainless steel**], insulated sandwich type construction.

C. Frame: Form of minimum 16 gauge steel sheet [**stainless steel**] of depth and configuration to suit material and type of construction where installed. Provide frame flange at perimeter where installed in concrete, masonry, or existing openings. Weld exposed joints in flange and grind smooth. Provide expanded galvanized metal lath perimeter wings when installed in plastered partitions.

D. Automatic Closing Device: Provide automatic closing device for each door.

E. Hinge: Continuous steel hinge with stainless steel pin.

F. Lock: Self-latching, flush-mounted paddle latch with key-operated cylinder lock with two keys. Interior latch release device operable from inside of door.

2.04 ACCESS DOORS, FLUSH PANEL

A. In Gypsum Board framed [**for walls and ceilings**]: Milcor Model DW prime painted with concealed hinges, size 24 inch x 30 inch.

B. Door Panel: Form of 14 gauge thick steel [**16 gauge thick stainless steel**] sheet. Reinforce as required to maintain flat surface.

C. Frame: Form of 16 gauge thick steel [**stainless steel**] sheet of depth and configuration to suit material and type of construction where installed. Provide surface mounted units having frame flange at perimeter where installed in concrete, masonry, or existing construction. Weld exposed joints in flange and grind smooth. Provide expanded galvanized metal lath perimeter wings when installed in plastered partitions.

D. Hinge: Concealed spring hinge to allow panel to open 175 degrees. Provide removable hinge pin to allow removal of panel from frame.

E. Lock: Cylinder lock, provide 2 keys per panel [**to match building key system**].

2.05 FINISH

A. Provide in accordance with NAAMM Metal Finishes Manual on exposed surfaces.

B. Steel Surfaces: Chemically bonded prime coat of baked-on electrostatic powder. [**Paint finish under Section 09 90 00.**]

C. Stainless Steel: Type 304, No. 4 finish, for exposed surfaces.

D. Signage: 1" high Helvetica Medium high silk screened text at Fire Department access panels. Colors: Red. Text: Fire Department. Submit text layout for approval.

PART 3 - EXECUTION

3.01 LOCATION

A. Provide wall and ceiling access doors wherever valves, traps, dampers, cleanouts or other control items of mechanical or electrical work are concealed in walls, partitions, or gypsum board or plaster ceiling construction and as indicated on drawings.

B. Use fire-rated doors in fire-rated partitions and ceilings.

C. Use flush panel doors in partitions and ceilings, except lay-in acoustical panel ceilings or upward access acoustical tile ceilings.

3.02 INSPECTION

A. Verify rough openings for door and frame are correctly sized and located.

B. Beginning of installation means acceptance of existing conditions.

3.03 INSTALLATION

A. Install frame plumb and level in ceiling openings.

B. Position to provide convenient access to concealed Work requiring access.

C. Secure rigidly in place in accordance with manufacturer's instructions.

D. Install access doors in openings to have sides vertical in wall installations, and parallel to ceiling grid or side walls when installed in ceiling. Set frames so that edges of frames without flanges will finish flush with surrounding finish surfaces. Set frames with flanges to overlap opening and so that face will be uniformly spaced from finish surface. Set access doors recessed so that face of surrounding materials will finish on same plane when door is installed.

E. Secure frames to adjacent construction using anchors attached to frames or by use of bolts or screws through frame members. Type, size and number of anchoring devices shall be suitable for material surrounding opening, and as required to maintain alignment and resist displacement during normal use of access door and building. [**Anchors for fire-rated access doors shall be as required by related fire test.**]

F. Adjust hardware so that door panel will open freely, and when closed door panel will be centered within frame.

G. Paint per Section 09 90 00, Painting.

END OF SECTION

SECTION 08 56 19

PASS WINDOWS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Extruded aluminum windows with operating sash, horizontal sliding.

B. Glazing

C. Operating hardware and locking hardware.

1.02 REFERENCES

A. ADA - Americans with Disabilities Act of 1990, as amended.
   1. ADA Standards - ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.

B. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape and Tube.

1.03 SYSTEM DESCRIPTION

A. Windows with horizontal sliding sash, minimum two leafs.

B. Glazing Interior.

1.04 SUBMITTALS

A. Product data including wall opening and component dimensions; wall opening tolerances required; anchorage and fasteners; affected related work and installation requirements.

B. Manufacturer's installation instructions.

C. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

D. Three samples illustrating window frame sections, corner section and glass.

1.05 DELIVERY, STORAGE AND HANDLING

A. Provide wrapping or strippable coating to protect prefinished aluminum surfaces.

1.06 WARRANTY

A. Provide under provisions of Division 01, General Requirements.

B. Provide five year manufacturer's warranty. Cover complete window system for failure to meet specified requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
   1. C.R. Laurence of North America, Los Angeles, CA.
   2. Nissen and Company, Inc., South El Monte, CA. Series E (without screens)
   3. Ready Access, West Chicago, IL.
   4. Quikserv Corporation, Houston, TX.

B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.02 MATERIALS

A. Extruded Aluminum ASTM B221; 6063 alloy, T5/T6 temper.

2.03 FABRICATED COMPONENTS

A. Heavy Duty Sliding Window: Model C.R. Laurence Deluxe aluminum Sliding Window DW Series, Model DW1800, self-latching handle, narrow 1-1/2” sightline frame, 4” deep, ball bearing top hung slider.
   1. Keyed lock and adapters
   2. Open Counter Area
   3. Exterior weather seals at exterior windows
   4. Stainless steel shelf, 12” deep by window manufacturer.
   5. Deal Tray
   6. Surround Frame
   7. Refer to drawing for configuration, size and locations.

B. ADA Compliant
   1. Door Operation
      a. Open: Maximum effort shall not exceed 5 pounds.
      b. Close: Self-closing.

2.04 GLASS AND GLAZING MATERIALS

A. Glass Materials: Scratch-resistant Lexan MR10, 1/4" thick.

B. Glazing Strips Vinyl, manufacturer's standard.

2.05 FABRICATION

A. Fabricate windows allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling installation.

B. Rigidly fit joints and corners. Accurately fit and secure corners tight. Make corner joints flush, hairline and weatherproof.

C. Prepare components to receive anchor devices.

D. Field glaze window units.

2.06 FINISHES

A. Interior Exposed Aluminum Surfaces: Satin anodized, clear.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install window frames, glass and glazing and hardware in accordance with manufacturer's instructions.

B. Use anchorage devices to securely attach frame to structure.

C. Align window frame plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.

D. Coordinate attachment with sill materials.

E. Install glass using dry method of glazing with glazing strips as provided by the manufacturer.

F. Adjust hardware for smooth operation and tight fit of sash.

G. Pass through windows for cashiers shall conform to reach and access requirements of CBC Chapter 11B for accessible transaction areas. Accessible pass through shelf shall not exceed 34 inches above finished floor surface.

3.03 CLEANING

A. Remove protective material from prefinished aluminum surfaces.

B. Wash down exposed surfaces using a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

END OF SECTION

NOTES TO ARCHITECT

Please review and edit highlighted areas as required before publishing specification

Edit options are typically flagged in the following manner:

[font in brackets] = edit options for consideration.

<font in carrots> = marker for inserting additional text

SECTION 087100 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Mechanical door hardware for:

a. Swinging doors.

B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 Section “Alternates” for alternates affecting this section.
2. Division 07 Section “Joint Sealants” for sealant requirements applicable to threshold installation specified in this section.

1.3 REFERENCES

A. UL - Underwriters Laboratories

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Key Systems and Nomenclature

C. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

D. Regulatory Requirements

- Doors/doorways as part of an accessible route shall comply with ***CBC Sections 11B-404***.
- The clear opening width for a door shall be 32" minimum. For a swinging door it shall be measured between the face of the door and the stop, with the door open 90 degrees. There shall be no projections into it below 34" and 4" maximum projections into it between 34" and 80" above the finish floor or ground. Door closers and stops shall be permitted to be 78" minimum above the finish floor or ground. ***CBC Section 11B-404.2.3***
- Handles, pulls, latches, locks, and other operable parts on accessible doors shall comply with ***CBC Section 11B-309.4*** and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Operable parts of such hardware shall be 34" minimum and 44" maximum above finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable form both side. ***CBC Section 11B-404.2.7***
- The force for pushing or pulling open a door shall be as follows: ***CBC Section 11B-404.2.9***.
    - Interior hinged doors, sliding or folding doors, and exterior hinged doors: **5 pounds (22.2 N)** maximum. Required fire doors: the minimum opening force allowable by the DSA authority, not to exceed **15 pounds (67N)**. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.
    - The force required for activating any operable parts, such as lever hardware, or disengaging other devices shall be **5 pounds (22.2N)** maximum to comply with ***CBC Section 11B-309.4***.
- Door closing speed shall be as follows: ***CBC Section 11B-404.2.8***
    - Closer shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is **5** seconds min.
    - Spring hinges shall be adjusted so that the required time to move a door from an open position of 70 degrees to the closed position is **1.5** seconds minimum.
- Thresholds shall comply with ***CBC Section 11B-404.2.5***.
- Floor stops shall not be located in the path of travel and 4" maximum from walls. ***DSA Policy 99-08.***
- Hardware (including panic hardware) shall not be provided with "Night Latch" (NL) function for any accessible doors or gates unless the following conditions are met per ***DSA Interpretation 10-08 DSA /AC (External), revised 4/28/09.*** Such conditions must be clearly demonstrated and indicated in the specifications:
    - Such hardware has a 'dogging' feature.
    - It is dogged during the time the facility is open.

- Such ‘dogging’ operation is performed only by employees as their job function (non-public use).

- Pair of doors: limit swing of one leaf to 90 degrees so that a clear floor space is provided beyond the arc of the swing for the wall-mounted tactile sign. ***CBC Section 11B-703.4.2.1***

1.4 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.
2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “EXAMINATION” article, herein.

B. Action Submittals:

1. Product Data: Product data including manufacturers’ technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.

    a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

3. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:

    a. Door Index; include door number, heading number, and Architects hardware set number.
    b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
    c. Type, style, function, size, and finish of each hardware item.
    d. Name and manufacturer of each item.
    e. Fastenings and other pertinent information.
    f. Location of each hardware set cross-referenced to indications on Drawings.
    g. Explanation of all abbreviations, symbols, and codes contained in schedule.
    h. Mounting locations for hardware.
    i. Door and frame sizes and materials.
    j. Name and phone number for local manufacturer's representative for each product.

4. Key Schedule:

    a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.

b. Use ANSI/BHMA A156.28 “Recommended Practices for Keying Systems” as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
   1) Forward bitting list, key cuts and key system schematic directly to Palomar Community Construction & Facilities Planning, by means as directed by Palomar Community Construction & Facilities Planning.

f. Prepare key schedule by or under supervision of supplier, detailing Palomar Community Construction & Facilities Planning’s final keying instructions for locks.

5. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier and Installer.
2. Certificates of Compliance:

   a. Certificates of compliance for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
   b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in “QUALITY ASSURANCE” article, herein.

3. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by qualified testing agency, for door hardware on doors located in accessible routes.
4. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data : Provide in accordance with Division 01 and include:

   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.
   c. Name, address, and phone number of local representative for each manufacturer.
   d. Parts list for each product.
   e. Final approved hardware schedule, edited to reflect conditions as-installed.
   f. Final keying schedule
   g. Copies of floor plans with keying nomenclature
   h. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.5 QUALITY ASSURANCE

A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.

1. Where specific manufacturer's product is named and accompanied by "No Substitute," including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)

    a. Where no additional products or manufacturers are listed in product category, requirements for "No Substitute" govern product selection.

2. Where products indicate "acceptable manufacturers" or "acceptable manufacturers and products", provide product from specified manufacturers, subject to compliance with specified requirements and "Single Source Responsibility" requirements stated herein.

B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
4. Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.

C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.

D. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
2. Manufacturers that perform electrical modifications and that are listed by testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

E. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

F. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

G. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

H. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release latch. Locks do not require use of key, tool, or special knowledge for operation.

I. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in "REFERENCES" article, herein.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbf (22.2 N).
2. Maximum opening-force requirements:

a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
b. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
4. Adjust door closer sweep periods so that, from open position of 70 degrees, door will take at least 3 seconds to move to 3 inches (75 mm) from latch, measured to leading edge of door.

J. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01.

1. Attendees: Palomar Community Construction & Facilities Planning, Contractor, Architect, Installer/Supplier, **[Palomar Community Construction & Facilities Planning's security consultant]**.
2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:

a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
b. Preliminary key system schematic diagram.
c. Requirements for key control system.
d. Requirements for access control.
e. Address for delivery of keys.
f. . **<Insert requirements to suit Project>.**

K. Pre-installation Conference: Conduct conference at Project site

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Review required testing, inspecting, and certifying procedures.

L. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.

a. Attendees: Door hardware supplier, door hardware installer, Contractor.
b. After meeting, provide letter of compliance to Architect, indicating when meeting was held and who was in attendance.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1. Deliver each article of hardware in manufacturer's original packaging.

C. Project Conditions:

1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:

1. Promptly replace products damaged during shipping.
2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

E. Deliver keys to manufacturer of key control system for subsequent delivery to Palomar Community Construction & Facilities Planning.

F. Deliver keys **[and permanent cores]** to Palomar Community Construction & Facilities Planning as directed by Dennis Astl.

1.7 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Palomar Community Construction & Facilities Planning's security consultant.

D. Direct shipments not permitted, unless approved by Contractor.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Years from date of Substantial Completion, for durations indicated.

a. Closers:
1) Mechanical: 30 years.

b. Locksets:
   1) Mechanical: 3 years.

c. Continuous Hinges: Lifetime warranty
d. Key Blanks: Lifetime

2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The Palomar Community Construction & Facilities Planning requires use of certain products for their unique characteristics and particular project suitability to insure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: “No Substitute.”

   1. Where “No Substitute” is noted, submittals and substitution requests for other products will not be considered.

B. Approval of manufacturers and/or products other than those listed as ”Scheduled Manufacturer ” or “Acceptable Manufacturers” in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

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

D. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

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

2.2 MATERIALS

A. Fasteners

   1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
   2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
   3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
   4. Install hardware with fasteners provided by hardware manufacturer.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.3 HINGES

A. Provide three-knuckle, concealed bearing hinges.

1. Manufacturers and Products:

a. Scheduled Manufacturer and Product: Ives 3CB series
b. Acceptable Manufacturers and Products: None

B. Requirements:

1. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:

a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

2. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:

a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
b. Interior: Heavy weight, steel, 5 inches (127 mm) high

3. 2 inches or thicker doors:

a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
b. Interior: Heavy weight, steel, 5 inches (127 mm) high

4. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
5. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
6. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

a. Steel Hinges: Steel pins
b. Non-Ferrous Hinges: Stainless steel pins
c. Out-Swinging Exterior Doors: Non-removable pins
d. Out-Swinging Interior Lockable Doors: Non-removable pins
e. Interior Non-lockable Doors: Non-rising pins

7. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.
8. Doors 36 inches (914 mm) wide or less furnish hinges 4-1/2 inches (114 mm) high; doors greater than 36 inches (914 mm) wide furnish hinges 5 inches (127 mm) high, heavy weight or standard weight as specified.
9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component.
10. Provide mortar guard for each electrified hinge specified.

11. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.

2.4 CONTINUOUS HINGES

A. Aluminum Geared

1. Manufacturers:

a. Scheduled Manufacturer: Ives.
b. Acceptable Manufacturers: Markar, Stanley.

2. Requirements:

a. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.25, Grade 2.
b. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum, with 0.25-inch (6 mm) diameter Teflon coated stainless steel hinge pin.
c. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
d. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
e. On fire-rated doors, provide aluminum geared continuous hinges that are classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
f. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware.
g. Install hinges with fasteners supplied by manufacturer.
h. Provide hinges with symmetrical hole pattern.

2.5 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage L9000 series
2. Acceptable Manufacturers and Products: None

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1 Operational, Grade 1 Security, and manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to “KEYING” article, herein.
2. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
3. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
4. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.

a. Lever Design: Schlage 06A.

2.6 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Schlage Classic Primus
2. Acceptable Manufacturers: No Substitute

B. Requirements:

1. Provide Schlage Classic Primus cylinders/cores with EP, EFP or FP section, confirm with Dennis Astl Manager, Construction & Facilities Planning. Compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.

   a. Keying: Manufacturer-keyed permanent cylinders/cores, configured into keying system per "KEYING" article herein.
   b. Features: Cylinders/cores shall incorporate the following features.

3. Nickel silver bottom pins.
4. Replaceable Construction Cores.

   a. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
      1) XX construction change (day) keys (confirm quantity)

   b. Palomar Community Construction & Facilities Planning or Palomar Community Construction & Facilities Planning's Representative will replace temporary construction cores with permanent cores.

2.7 KEYING

A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.

   a. Keying system as directed by the Palomar Community Construction & Facilities Planning.

2. Forward bitting list and keys separately from cylinders, by means as directed by Palomar Community Construction & Facilities Planning. Failure to comply with forwarding requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Palomar Community Construction & Facilities Planning.
3. Provide keys with the following features.

   a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)

4. Identification:

    a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication “Keying Systems and Nomenclature” for identification. Blind code marks shall not include actual key cuts.
    b. Identification stamping provisions must be approved by the Architect and Palomar Community Construction & Facilities Planning.
    c. Stamp cylinders/cores and keys with Palomar Community Construction & Facilities Planning’s unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with “DO NOT DUPLICATE” along with the “PATENTED” or patent number to enforce the patent protection.
    d. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Palomar Community Construction & Facilities Planning.
    e. Forward permanent cylinders/cores to Palomar Community Construction & Facilities Planning, separately from keys, by means as directed by Palomar Community Construction & Facilities Planning.

5. Quantity: Furnish in the following quantities. Confirm quantity with Dennis Astl Manager, Construction & Facilities Planning

    a. Change (Day) Keys: 3 per cylinder/core.
    b. Permanent Control Keys: 3.
    c. Master Keys: 6.
    d. Unused balance of key blanks shall be furnished to Palomar Community Construction & Facilities Planning with the cut keys.
    e. Extra Keys:
        1) **<insert quantity>** Construction Keys

2.8 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4010/4110/4020 series.
2. Acceptable Manufacturers and Products: No Substitute.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. Certify surface mounted mechanical closers to meet fifteen million (15,000,000) full load cycles. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2 inch (38 mm) diameter with 11/16 inch (17 mm) diameter double heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers. When closers are parallel arm mounted, provide

closers which mount within 6-inch (152 mm) top rail without use of mounting plate so that closer is not visible through vision panel from pull side.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI/BHMA Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.9 DOOR TRIM

A. Manufacturers:

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

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide flush pulls as scheduled. Where required, provide back-to-back mounted model.
5. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
6. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
7. Provide wire pulls of solid bar stock, diameter and length as scheduled.
8. Provide decorative pulls as scheduled. Where required, mount back to back with pull.

2.10 PROTECTION PLATES

A. Manufacturers:

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

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:

a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.11 DOOR STOPS AND HOLDERS

A. Manufacturers:

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

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.12 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International
2. Acceptable Manufacturers: No Substitute

B. Requirements:

1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Size of thresholds:

a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width

3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.13 SILENCERS

A. Manufacturers:

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

B. Requirements:

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

2.14 COAT HOOKS

A. Manufacturers:

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

B. Provide coat hooks as specified.

2.15 FINSHES

A. Finish: BHMA 626/652 (US26D); except:

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

PART 3 - EXECUTION

3.1 EXAMINATION

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

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

3.2 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

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

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

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

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

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

G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

H. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying section.
2. **OPTION: Furnish permanent cores to Palomar Community Construction & Facilities Planning for installation.**

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

J. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.

K. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

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

M. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

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

3.3 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 to comply with accessibility requirements and requirements of authorities having jurisdiction.

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

3.4 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.5 DEMONSTRATION

A. Provide training for Palomar Community Construction & Facilities Planning's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.6 DOOR HARDWARE SCHEDULE

A. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.

B. Hardware Sets:

Hardware Group 01 - BUILDING ENTRANCE

SGL 3' 0" X 7' 0" X 1 3/4" X WD X HMF X NONRTD
Door(s):
203A

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONT. HINGE	224HD	628	IVE
1	EA	CLASSROOM SEC HOLDBK	L9077L LLL 06A L283-150	630	SCH
1	EA	MORTISE CYLINDER	30-138-ICX	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	ADA THUMBTURN	09-509 X L583-363	626	SCH
1	EA	DOOR PULL	VR900	630	IVE
1	EA	SURFACE CLOSER	4111 SCUSH MC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	HEAD SEAL	429A	A	ZER
1	EA	JAMB SEALS	326AA	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	103A-226	A	ZER
1	EA	RAIN DRIP	142A	A	ZER

PREP DOOR FOR THUMB-TURN, DO NOT PREP FOR INSIDE CYLINDER.

Hardware Group 02 - WAITING ROOM

SGL 3' 0" X 7' 0" X 1 3/4" X WD X HMF X NONRTD
Door(s):
107B

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 06A	630	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH MC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S-BK	S-Bk	ZER

Hardware Group 03 - OFFICE

SGL 3' 0" X 7' 0" X 1 3/4" X WD X HMF X NONRTD
Door(s):
203D 203E 203F

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	OFFICE W/SIM RETRACT	L9056T 06A L583-363	630	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	FLOOR STOP	FS439	682	IVE
1	EA	GASKETING	188S-BK	S-Bk	ZER
1	EA	COAT HOOK	508	626	IVE

Hardware Group 04 - IDF/UTILITY

SGL 3' 0" X 7' 0" X 1 3/4" X WD X HMF X NONRTD
Door(s):
203C

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080T 06A	630	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH MC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

End of Section

SECTION 09 01 90

PREPARING EXISTING SURFACES FOR PAINTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes preparing and repairing existing surfaces for painting. This work may include chemical de-glossing of lead-based paint and removal of mold or mildew infested materials.

B. Related Sections
   1. Section 09 90 00, Painting

1.02 REFERENCES

A. ASTM - American Society for Testing and Materials
   1. ASTM D3359 - Test Methods for Measuring Adhesion by Tape Test
   2. ASTM D4258 - Surface Cleaning Concrete for Coating
   3. ASTM D4259 - Practice for Abrading Concrete

B. SCAQMD – South Coast Air Quality Management District
   1. SCAQMD-403 - SCAQMD Rule 403, Fugitive Dust
   2. SCAQMD-1113 - SCAQMD Rule 1113, Architectural Coatings
   3. SCAQMD-1140 - SCAQMD Rule 1140, Abrasive Blasting
   4. SCAQMD-1168 - SCAQMD Rule 1168, Adhesive and Sealant Applications
   5. SCAQMD-1171 - SCAQMD Rule 1171, Solvent Cleaning Operations

C. SSPC - Steel Structures Painting Council, Surface Preparation (SP) Standards
   1. SSPC SP-1 - Solvent Cleaning
   2. SSPC SP-2 - Hand Tool Cleaning
   3. SSPC SP-3 - Power Tool Cleaning
   4. SSPC SP-6 - Commercial Blast Cleaning
   5. SSPC SP-7 - Brush-Off Blast Cleaning
   6. SSPC SP-8 - Acid Etch Cleaning (Pickling)

1.03 SUBMITTALS

A. Action Submittals
   1. Product Data for each type of cleanser and accessory item.
   2. MSDS for mildewcide
   3. Manufacturer’s Installation Instructions

1.04 QUALITY ASSURANCE

A. Certification of Materials. With each delivery of materials, manufacturer shall certify that materials comply with requirements of this Section.

B. Product Manufacturers: companies with minimum 10-years' experience manufacturing commercial quality cleaning, and surface preparation products for commercial projects similar in scale and complexity to those required for this Project.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in their original, unopened, and undamaged containers bearing manufacturers' labels, legible and intact.
   1. Open materials on premises in presence of the Inspector. Immediately remove rejected materials from premises. Obtain new complying materials without claim for change in Contract Sum or Schedule.

B. Storage and Mixing of Materials. Store materials and mix only in spaces designated for this purpose by Inspector. Keep such spaces clean and take necessary precautions to prevent fire. Hang out oily rags, singly, in the open air. Stack containers so that manufacturer's labels are clearly displayed.

C. Take necessary precautions to secure materials and equipment after the completion of each day's work to prevent damage, theft and vandalism.

1.06 PROJECT CONDITIONS

A. Maintain surface and ambient temperatures above 45-degrees-F for 24 hours before, during and for at least 48 hours after applications, unless permitted otherwise by manufacturer's instructions.

B. Provide lighting level sufficient to conduct operations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cleansers, chemical de-glossers, and related materials shall comply with applicable requirements of the Food and Drug Administration's (FDA) Lead Law requirements of the California Air Resources Board (CARB), and the Environmental Protection Agency (EPA).
   1. Cleansers, chemical de-glossers, and related materials shall be suitable for the use intended and compatible with the finish scheduled.

B. Mildewcide: commercially prepared fungicide, biocide, or anti-microbial agent suitable for killing mold and mildew and scrubbing surface manifestations of infestation from material.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine surfaces to be repaired and prepared.
   1. Determine, by field testing, whether scheduled finishes are compatible with existing coatings to ensure proper adhesion.

2. For field test, apply a Finish Sample of scheduled finish over approximately 1/2 of Surface Prep Field Sample. Finish Sample shall be at least 3-feet square and be located in direct sunlight for an exterior application; allow Sample to dry for 1 week. Test adhesion using ASTM D3359.

B. Do not begin installation until unsatisfactory conditions are corrected. Beginning installation means acceptance of existing conditions and preparatory work of others.

3.02 PROTECTION

A. Protect work of other trades and existing adjacent surfaces or areas, whether to be coated or not, against damage from this work. Correct damage by cleaning, repairing, replacing and recoating as acceptable to the Inspector. Leave in an undamaged condition.

B. Provide sufficient drop cloths, shields, and protective equipment to prevent spray, over-spray or droppings from fouling surfaces, furniture, equipment, cabinets, etc.

C. Protect prefinished surfaces, lawns, shrubbery, and adjacent surfaces against damage.

D. Protect surfaces, equipment and fixtures from damage resulting from use of fixed, movable and hanging scaffolding, planking and staging.

E. Place waste materials, cloths, and material that may constitute a fire hazard in closed metal containers and remove daily from the site.

F. Remove electrical plates, surface hardware, fittings and fastenings, and items attached to the finish surface, prior to preparation operations. Inventory and mark for storage. Do not use solvents, which may remove permanent lacquer finish, to clean hardware or other items.

G. Provide signs, barricades and other devices required to protect newly prepared surfaces.

H. After each day's work, take precautions to secure equipment and supplies to prevent damage, theft, and vandalism due to access by unauthorized persons.

I. Do not paint over cover name plates, cable or device identification labels, codes, or required signage, etc.

3.03 PREPARATION OF EXISTING PAINTED SURFACES - GENERAL

A. Assign experienced workers, skilled in their trades to this work. Surface preparation shall comply with standards of the Painting and Decorating Contractors of America.

B. Prepare ceilings, then walls.

C. Remove posters, art work, and appliqués, remove residual adhesive, fill tack and nail holes, and clean as specified in this Section.

D. Remove surface contaminants such as oils, grease, loose paint, cracking, blistering, peeling, or flaking paint, dirt, foreign matter, rust, and other surface contaminants that will interfere with adhesion of scheduled finish, without damaging the substrates and adjacent areas; use methods referenced in ASTM D4258. Let dry thoroughly, lightly sand surfaces.

E. Remove substrate materials infested with mold or mildew. Extend removal in all directions from infested site to nearest natural break or support that will facilitate patch and repair. Handle and discard removed materials as hazardous waste. Haul debris, off-site, to disposal facility legally franchised to accept such materials.

F. In existing rooms and areas where alterations occur, clean existing transparent wood finishes. Retouch abraded surfaces and apply 1 coat of polyurethane varnish to exposed surfaces.

G. Coat knots and pitch streaks that show through old finish with knot sealer before refinishing.

H. Advise District a minimum or 72 hours in advance of any preparation operation which will generate excessive noise or dust such as sandblasting.
   1. All sandblasting shall be done with green-friendly product(s) and process.

3.04 PREPARATION OF INTERIOR SURFACES - NON LEAD PAINT

A. Wood, Plaster, and Metal Surfaces, with sound, low sheen, finish coating. Strip and completely remove wax, if any, before washing. Wash with TSP (trisodium phosphate), to remove dirt, grease and other foreign materials, rinse with clean water and then sand and dust off.

B. Wood, Plaster, and Metal Surfaces, with checked, cracked, blistered, scaled, loose, and alligatored paint. Removed defective finish down to bare substrate with hand-tools, chemical stripper, or both, hand sand, and dust clean. Wash remaining sound finish as above. Feather the edges of paint removal into the existing finishes to remain to maintain proper and uniform finish.

C. Wood Doors and Cabinet Work scheduled for reapplication of transparent finishes. Strip existing finish, sand surfaces thoroughly with a 5/0, 180 grit, sandpaper and dust clean.

D. Gypsum Board. Remove contamination from surfaces and prime to show defects, if any. Fill defects in surfaces flush with adjacent surfaces. Feather edges of patch into the existing adjacent surface. Repair cracks, holes, gouges, and damaged spots larger than 1/4-inch with joint compound.

E. Concrete and Unit Masonry Surfaces. Remove dirt, salt- or alkali-residue, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering or corroding metals by thoroughly wetting with water and washing with a solution of sodium metasilicate. Allow to dry.

F. Existing glossy paint films must be cleaned and dulled (de-glossed) before repainting. Wash thoroughly as specified and dull by sanding.

3.05 PREPARATION OF INTERIOR SURFACES - LEAD PAINT

A. Checked, Cracked, Blistered, Scaled, Loose, and Alligatored Paint. Removed defective finish down to bare substrate with chemical stripper.

B. Sound Finish Coating. Strip and completely remove wax, if any, before washing. Wash with TSP (trisodium phosphate), to remove dirt, grease and other foreign materials, rinse with clean water and let dry.
   1. Dull (de-gloss) existing finish with chemical de-glosser; control application and flow of de-glossing agent.

C. Collect, handle, and dispose of waste as required by the authorities having jurisdiction for hazardous (lead containing) waste. Workers shall isolate work area and wear protective clothing as required by OSHA.

3.06 PREPARATION OF EXTERIOR SURFACES WHERE EXISTING (NON-LEAD) COATING IS COMPATIBLE WITH SCHEDULED NEW FINISH

A. Examine surfaces for cracking, blistering, peeling or flaking of existing paint. Remove loose, unsound, and non-adhering paint, feather edge at transitions. Repair existing surfaces and prepare surfaces for new finishes as scheduled. Lightly sand surfaces prior to painting.
   1. Remove surface contaminants such as oils, grease, loose paint, dirt, foreign matter, rust, mold, mildew, efflorescence, and other surface contaminants that will interfere with adhesion of subsequent coats without damaging the substrates or adjacent areas by methods referenced in ASTM D4258.
   2. Glossy surfaces of existing paint films must be cleaned and washed thoroughly as specified and dull by sanding before painting. Degloss glossy and previously enameled surfaces by sanding or abrasive cleanser to provide a roughened surface or “tooth” for proper adhesion of scheduled finish.

3.07 PREPARATION OF EXTERIOR SURFACES WHERE EXISTING (NON-LEAD) COATING IS NOT COMPATIBLE WITH SCHEDULED NEW FINISH

A. Remove entire existing coating by blast cleaning per one of the following ASTM D4259 methods. Use method that removes coatings completely.
   1. Dry sand-blast lightly using 16- to 30-mesh sand and oil-free air sprayer. Hold nozzle approximately 2 feet from the surface to be blasted move nozzle at a uniform rate. Surface must be clean and dry and exhibit texture similar to that of medium grit sandpaper. Vacuum or blow down to remove dust and loose particles from the surface.
   2. Water blasting with pressure at 2500 psi at flow of 4 to 14 gallons per minute.
   3. Include 72 hour advance notification to District of any dry or wet blasting activities.

3.08 REPAIRING CRACKS AT INTERIOR PLASTER AND CONCRETE SURFACES

A. Hairline Cracks: V-groove cracks then patch with elastomeric sealant.

B. Small to Large Cracks: Use elastomeric sealant to fill and span cracks up to 1/32-inch. A credit card thickness or greater (1/8"), fill with an elastomeric sealant (recommended by the Paint Manufacturer). Apply one coat of primer, then coat with 100-percent acrylic, elastomeric finish.

C. Large Cracks (1/4- to 1/2-inch). Rake to 1/4-inch minimum wide, then fill with an elastomeric sealant.
   1. Apply 1 coat of primer, then coat with 100-percent acrylic, elastomeric finish.
   2. Apply a primer coat over the elastomeric coating to change absorbency to be similar to adjacent wall surface. Elastomeric sealant shall be compatible with paint applications used and manufacturer's recommendations.

3.09 REPAIRING CRACKS AT EXTERIOR PLASTER AND CONCRETE SURFACES

A. Hairline Cracks: Apply 2 coats of elastomeric coating to bridge hairline cracks to 1/32".

B. Small to Large Cracks: from 1/32" to 1/8" fill with an elastomeric sealant, apply 2 coats of elastomeric coating.

C. Large Cracks: cracks from 1/4" to 1/2", raked out crack(s) to 1/4" minimum wide, fill with an elastomeric sealant, apply 2 coats of elastomeric coating.

D. All elastomeric sealant shall be compatible with paint applications used and manufacturer's recommendations.

E. Apply a primer coat over the elastomeric coating to change absorbency to be similar to adjacent wall surface.

F. Finish Coat: apply final application of finish coat over patched areas to match existing adjacent texture. Use an integral-color finish stucco material with a bonding admixture mixed according to manufacturer's recommendation.

G. Efflorescence: repair surfaces and remove deposits by wire brushing and acid etching with phosphoric acid. Rinse surfaces with water to remove any remaining residue. Prior to proceeding with any painting of these surfaces obtain the approval of the Architect and Inspector.

3.10 PREPARATION OF EXISTING MASONRY SURFACES

A. Use the following procedures to repair existing masonry surfaces.
   1. Power wash, sandblast, or wire brush areas to be painted and use a mild solution such as Mi-T-M's Surface Prep. Rinse with clean water until residues have been removed from surfaces. If mold or mildew is present, meter a mildewcide into the power washer.
   2. Remove dirt, chalk, and surface contaminants that will interfere with adhesion of subsequent coats without damaging the substrates or adjacent areas. Washed surfaces must be thoroughly dry before proceeding with preparation or painting.
   3. Remove efflorescence before proceeding with preparation or painting as specified.

4. After washing surfaces, carefully examine for cracking, blistering, peeling, or flaking of the existing paint. Loose, unsound, or non-adhering paint must be removed. Prepare surfaces as specified above.
5. De-gloss previously enameled and glossy surfaces; provide a roughened surface or “tooth” for good adhesion of subsequent coats.

3.11 CLEANING, TOUCH-UP AND REFINISHING

A. As work proceeds and upon completion, promptly remove paint where spilled, splashed, or spattered.

B. During progress of work keep premises free from any unnecessary accumulation of tools, equipment, surplus materials, and debris.

C. Upon completion of work remove rubbish, paint cans and accumulated materials resulting from work in each space or room. Areas shall be left in a clean, orderly condition to the satisfaction of the Owner.

D. Upon completion of painting, clean glass and paint spattered surfaces. Remove spattered paint by washing, scrapping or other professional methods using care not to scratch or damage adjacent finished surfaces.

E. Protect completed work until Date of Substantial Completion.

END OF SECTION

SECTION 09 29 00

GYPSUM BOARD

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Gypsum Board Panels.

B. Taped and sanded joint treatment.

C. Related Sections:
1. Section 05 40 00 - Cold-Formed Metal Framing.
2. Section 09 90 00 - Painting

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)
1. ASTM C475 - Joint Compound and Joint Tape for Finishing Gypsum Board.
2. ASTM C645 - Specification for Nonstructural Steel Framing Members.
3. ASTM C754 - Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
4. ASTM C840 - Application and Finishing of Gypsum Board.
5. ASTM C954 - Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. to 0.112 in. in thickness.
6. ASTM C1002 - Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
7. ASTM C1177 - Glass Mat Gypsum Substrate for Use as Sheathing.
8. ASTM C1178 - Glass Mat Water-Resistant Gypsum Backing Panel.
9. ASTM C1396 - Specification for Gypsum Board.

B. Gypsum Association (GA)
1. GA-201 - Gypsum Board for Walls and Ceilings
2. GA-214 - Levels of Gypsum Board Finish
3. GA-216 - Application and Finishing of Gypsum Board
4. GA-600 - Fire Resistance Design Manual

C. 2013 California Building Code (CBC)
1. CBC-7 - Chapter 7, Fire Resistant Materials and Construction
2. CBC-25 - Chapter 25, Gypsum Board and Plaster.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other units of Work.

C. Samples: For following products:
   1. Trim Accessories: Full-size sample in 12-inch-long length for each trim accessory indicated.
   2. Textured Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.

1.04 QUALITY ASSURANCE

A. Applicator: Company specializing in gypsum board systems work with three years experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

C. Steel Framing and related accessories shall be stored and handled in accordance with AISI Code of Standard Practice.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturer form basis for design and quality intended:
   1. United States Gypsum Corporation (USG), Chicago, IL.

B. Subject to compliance with requirements, other acceptable manufacturers include the following:
   1. Georgia-Pacific, Atlanta, GA.
   2. National Gypsum Co./Gold Bond Building Products, Charlotte, NC.
   3. Pabco Gypsum, Rancho Cordova, CA.
   4. CertainTeed Corporation, Valley Forge, PA.
   5. Temple-Inland Forest Products, Diboll, TX.

C. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.02 BOARD MATERIALS

A. Regular Gypsum Board: ASTM C1396; 5/8 inch thick, maximum permissible length; ends square cut, tapered round edges, USG SHEETROCK BRAND TAPERED GYPSUM PANELS.

2.03 MATERIALS

A. Furring Channels: 25 gauge galvanized steel, 7/8 inch deep by 2-9/16 inch wide hat channels, 275 pounds per 1,000 feet weight, FHC-25 and CEMCO METAL FURRING CHANNEL CLIPS. Z Type, where required: CEMCO Z-FURRING CHANNEL, 1", 1-1/2", 2" and 3" depths.
   1. Dietrich UltraSteel Framing, 25 gauge or equal.
   2. Furring Channels at Cementitious Backing Board Ceilings: 20 gauge, PWC-20.

B. Angles: 1-3/8 inch by 7/8 inch, 24 gauge, Dietrich Metal Framing, CEMCO GALVANIZED METAL ANGLES or equal.

C. Runner Channels: Minimum weights, sizes and maximum spans conform to reference standard listed in Table 2506.2 California Building Code, 1-1/2", 1.12 lbs/foot, hot-rolled channels as defined therein.

D. Hanger Wire: 8 gauge for 16 square feet maximum, galvanized annealed, size of wire in accordance with reference standard listed Table 2506.2, California Building Code.

E. Tie Wire: 18 gauge galvanized annealed.

F. Taping, Bedding and Finishing Compound: ASTM C475; compatible with tape and substrate.
   1. USG SHEETROCK Brand Taping Joint Compound Ready-Mixed, drying-type, non-asbestos, vinyl base.
   2. USG SHEETROCK Brand Topping Joint Compound Ready-Mixed, drying-type non-asbestos, vinyl base.
   3. USG SHEETROCK Powder Joint Compound, drying-type, non-asbestos vinyl base, conventionally drying. For Taping and Topping.
   4. USG SHEETROCK Powder Setting-type Joint Compound, chemical hardening.
   5. Contractor's Option: USG SHEETROCK Lightweight All Purpose Joint Compound (Plus 3) with Dust Control.
   6. USG SHEETROCK Brand All Purpose Joint Compound Ready-Mixed for laminating gypsum panels in multilayer partitions.
   7. USG SHEETROCK Brand Joint Tape-Heavy, ASTM C475, high strength cross-fibered paper tape.
   8. Drywall Primers: USG First Coat.
   9. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

G. Accessories: Corrosive Protective-Coated steel.
   1. U-Trims: USG, Dietrich No. 200-A for joint compound or equal. [USG, Dietrich No. 801A for one-coat plaster system and No. 701A for two-coat plaster].
   2. J-Trim Casings, reveal type: USG, Dietrich No. 401 for 1/2" panels, 402 for 5/8" panels, no finishing compound.
   3. Control Joint: Dietrich 093, USG Control Joint No. 093, Zinc metal.
   4. Corner Bead: USG, Dietrich No. 103 for joint compounds or equal. .

H. Fasteners: Self-drilling tapping screws shall comply ASTM C 954; Self piercing screws shall comply ASTM C 1002;

1. ASTM C1002, No. 2 Phillips recessed, bugle head, power-driven. Nails not permitted.
2. Type S-12, ASTM C954, 16 gage steel studs, minimum penetration 3/8 inch.
3. Type S, ASTM C 1002, 20 gage steel studs, minimum penetration 3/8 inch.
4. Type G, gypsum board to gypsum board, minimum penetration 1/2 inch.
5. Type W, wood construction, minimum penetration 5/8 inch.

I. Bond Coat for Ceramic Tile and Skim Coat: Latex Portland Cement Fortified Mortar ANSI/TCNA 118.4.

J. Waterproofing Membrane: ASTM D4601, Type I, asphalt saturated glass felt or equal and self-adhered membranes, 40 mils, around openings.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that site conditions are ready to receive Work.

B. Beginning installation means acceptance of substrate.

3.02 PREPARATION

A. Delivery and Storage: Arrange for an adequate supply of materials on the jobsite so that progress of Work will be uninterrupted. Materials and accessories shall be delivered in original containers and bundles, and identified with the manufacturer's name and brand. Store gypsum board on flat, solid supports in dry areas, well protected from the elements.

B. Provide fixtures, anchors, sleeves, inserts and miscellaneous items, and provide openings and chases as necessary. Prior to closing in and finishing of dry wall Work, ascertain that piping, conduit, ductwork and fixtures which are to be concealed and which penetrate gypsum boards are in place, tested and approved.

C. Scaffolding: Construct, erect and maintain in conformance with applicable laws and ordinances.

D. Protection, Patching and Cleaning: Adjacent surfaces of other materials shall be protected from damage. Dry wall surfaces that have been cut out shall be neatly patched. Damaged or defective gypsum board finish shall be replaced. During progress of Work, rubbish droppings and water materials shall be removed.

E. Fire Sprinkler System: In areas where sprinkler heads occur, exercise care when installing drywall work. Do not damage or obstruct the heads in any way.

3.03 GYPSUM BOARD INSTALLATION

A. Install gypsum board in accordance with ASTM C840, GA 201, GA 216 and Section 2508 California Building Code. Use board types as indicated; if not indicated use board types as follows.

B. Non-rated: Erect single layer gypsum board parallel or perpendicular on vertical framing, attached to studs and framing members with the specified fasteners spaced at 16" on center with screws and at top and bottom, 12" on center with screws at ceilings. Solid backing not required at joints running perpendicular to studs and framing members for walls.
   1. For walls requiring STC 50 or higher, install extra layer of 1/2" gypsum board on one side, unless noted otherwise on wall schedule.

C. Treat cut edges and holes in moisture-resistant gypsum board with sealant.

D. Place control joints consistent with lines of building spaces as indicated or at maximum of 30 ft on centers. At rated walls, provide with fire rated panels same as wall construction.

E. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.

F. Seal all cutout and penetrations: For electrical, mechanical, plumbing and structural framing cutouts and penetration at interior surfaces. Per Section 07 92 00 for non-rated wall.

3.04 JOINT TREATMENT

A. Exposed gypsum board in wall areas and ceiling areas shall have joint compound and be taped and sanded per requirements of GA-114 for levels specified and ready for paint.

B. On installations where two layers of gypsum board are required, only the face layer will require finishing of joints and screwheads.

C. Gypsum wallboard joints in walls may either be exposed or covered with joint tape and joint compound for the portion of the wall above a suspended ceiling, which is part of a fire resistive floor-ceiling or roof-ceiling assembly, as listed in U.L. Fire Resistive Ratings (BXUV), when the following conditions are met:
   1. Vertical joints occur over framing members.
   2. Horizontal joints are staggered 24 inches on opposite sides or covered with 6 inch wide strips of gypsum board attached with 1-1/2 inch laminating screws at 8 inches on centers.
   3. Partition is two-ply system with joints staggered 16 inches or 24 inches.
   4. Partition is not part of a smoke or sound control system.

D. Joints, except where excluded above including internal corners, shall be filled and taped. Thin uniform layer of joint compound, approximately 3 inches wide, shall be applied over joint. Tape shall be set in joint compound and finish levels required below. Internal angles, both horizontal and vertical, shall be reinforced and with tape folded to form straight and true angle. Metal external corners shall be set in place. Joints shall be allowed to dry at least 24 hours between each application of cement.

E. Gypsum board finish shall be to the following levels as defined by GA-214:
   1. Plenum areas above ceilings - Level 1.
   2. Substrate for tile, tackable wall panels, tackboards and markerboards - Level 2.

3. Areas receiving heavy textured paint - Level 3.
4. Areas receiving vinyl wall covering, high impact wall covering, texture finish or light textured flat paint - Level 4.
5. All Areas receiving non-textured, flat, egg-shell, gloss or semi-gloss paint - Level 5. Backroll application of sealer. Level 5 requires one of the following.
   a. Skim coat: A thin skim coat of joint compound, or a material manufactured especially for this purpose, shall be applied to entire surfaces. Surfaces shall be smooth and free of tool marks and ridges.
   b. Acrylic latex-based coating, spray apply: USG SHEETROCK Brand Primer-Surfacer Tuf-Hide or ProForm Surfacer/Primer by National Gypsum or equal. Apply to 15-20 mils wet film thickness to entire surface.
   c. Prep Coat Plus by Hamilton Materials Inc, Orange, CA.
   d. Additionally apply primer coat per Section 09 90 00 Painting.

3.05 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 51 00

ACOUSTICAL CEILINGS - LAY-IN

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Acoustical panels, lay-in.

B. Related Sections:
   1. Section 09 06 00, Schedules for Finishes.
   2. Section 09 53 23, Acoustical Suspension Systems.

1.02 REFERENCES

A. CBC - California Building Code, 2013.

B. ASTM E84 - Surface Burning Characteristics of Building Materials.

C. ASTM E1264 - Acoustic Ceiling Products.

1.03 SUBMITTALS

A. Product data for acoustical panels.

B. Three samples illustrating material and finish of acoustic units.

C. Manufacturer's installation instructions.

1.04 QUALITY ASSURANCE

A. Qualifications
   1. Manufacturer: Company specializing in manufacture of ceiling panels with five years minimum experience.
   2. Installer: Company with three years minimum experience.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Interior wet work shall be completed prior to installation of panels. Windows and doors shall be in place. HVAC systems shall be installed and operable where necessary to maintain a temperature range of 60 to 85 degrees F and maximum 70 percent relative humidity.

1.06 EXTRA STOCK

A. Provide extra quantity of acoustic units in the amount of one box of each type specified.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of the following manufacturers form the basis for design and quality intended.
   1. Armstrong World Industries, Lancaster, PA.
   2. USG Corporation, Chicago, IL.
   3. CertainTeed Corporation, Malvern, PA.

B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.02 MATERIALS

A. Acoustical Panels: Cortega Second Look II 2767 , ASTM E1264.
   1. Size: 24 x 48 inches.
   2. Thickness: 3/4 inches.
   3. Light Reflectance: 0.81.
   4. NRC: 0.55.
   5. CAC: Minimum 35
   6. Edge: Angled Tegular.
   7. Surface Color: Factory White.

B. Retention Clips: Armstrong #414 Retention Clip or equal. Refer to INSTALLATION Part 3 for conditions requiring clips.

C. Refer to Section 09 06 00 Schedules for Finishes.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that existing conditions are ready to receive work.

B. Verify that layout of hangers will not interfere with installation of acoustic units.

C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.

B. Where square units are indicated, lay directional patterned units in basket weave pattern. Fit border neatly against abutting surfaces.

C. Install acoustic units level, in uniform plane, and free from twist, warp and dents. Replace damaged or soiled units.

D. Provide for complete accessibility for all units.

E. Install Retention Clips at metal ceiling panels and panels weighing more than 1/2 psf other than acoustical panels.

END OF SECTION

SECTION 09 53 23

ACOUSTICAL SUSPENSION SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Perimeter trim.

C. Suspension Accent Trim.

D. Related Sections:
   1. Section 09 51 00, Acoustical Ceilings.
   2. Section 09 06 00 Schedules for Finishes.

1.02 REFERENCES

A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings

B. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

C. ASTM E84 - Surface Burning Characteristics of Building Materials.

D. ASTM E580 - Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint.

E. ASCE/SEI 7-10 - American Society of Civil Engineers/Structural Engineering Institute, Standard 7-10.

F. CBC - 2013 California Building Code.

G. Chapter 19, 2013 California Building Code.

H. Chapter 23, 2013 California Building Code.

1.03 SUBMITTALS

A. Shop drawings indicating, grid layout and related dimensioning, junctions with other work or ceiling finishes and interrelation of mechanical and electrical items. Photographic reproductions of the contract drawings shall not be used.

B. Product data.

C. Three samples of each suspension system main runner, cross runner and edge trim.

D. Manufacturer's installation instructions.

E. Submit one copy of ICC-ES Reports Armstrong ICC-ES, ESR-1308

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacture of ceiling suspension system with five years minimum experience.

B. Installer: Company with five years minimum experience.

C. Fire Classification Requirements: ASTM E84, all materials shall have Flame Spread Index rating of less than 25 and Smoke Developed Index rating of less than 450.

D. Products must comply with ICC-ES Reports.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
   1. Armstrong World Industries. Lancaster, PA. Product: Prelude XL, 15/16 inch Exposed Tee.

B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.02 SUSPENSION SYSTEM MATERIALS

A. Grid: ASTM C635, Armstrong Prelude Heavy Duty XL 15/16” ceiling system, galvanized components die cut and interlocking.
   1. Main Runners:
      a. Armstrong: Heavy Duty Prelude XL 7301, exposed T.
   2. Cross Tees – “Stake-on end”, Stepped End:
      a. Armstrong: XL7341 (48 inch grid) .
   3. Edge Trim:
      a. Armstrong Angle Molding: 7800, 7/8”, Prelude with BERC2 Retention Clip .

B. Beam End Retention Clip: slide clip for free end of main-runners and cross-tees with 2-inch movement capability.
   1. Acceptable Product: Armstrong, BERC2, or equal,

C. Hold-Down Clips: Armstrong UHDC Clip (Universal Hold Down Clip) at fire-rated assemblies, fire-rated corridors, exitways and entryways, manufacturer’s standard at non-rated ceilings.

D. Long Panel Stabilizer Clips: Armstrong #435, 3/4”- 1” thick, for panels 5’ and longer.

E. Retention Clips: Armstrong #414 Retention Clip or equal. At non-rated ceilings.

F. Accessories: Stabilizer bars, panel stabilizer clips, adapters, splices, edge trim and all necessary components required for the specified suspended grid system.

G. Grid Materials: main runners, cross runners, splices, expansion devices and intersection connectors, commercial quality cold rolled steel with galvanized coating. Designed to carry a mean ultimate test load on not less than 180 lbs. compression and tension per ASTM E580 Section 5.1.2. The ceiling grid system must be rated as Heavy Duty as defined by ASTM C635.

H. Grid Finish: Factory applied standard white.

I. Hanger Wire: No. 12 gauge wire shall be 0.106 inch in diameter conforming to ASTM A641. No. 12 gage wire shall be soft annealed, galvanized steel wire with a Class 1 zinc coating.

J. Suspension Accent Trim: ASTM C635, Armstrong “Axiom Classic Trim”-Straight “Axiom Transitions trim”, extruded aluminum. Nominal sizes: 6” . Provide attachment clips, corner pieces, splices, integral drywall trims (when detailed), and related accessories. Refer to drawings for location and sizes and curve requirements. Color: to match grid system .

K. Armstrong Prelude Concealed Tee System
   1. Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel (aluminum or stainless steel) in baked polyester paint. Main beams and cross tees shall have rotary stitching (exception: extruded aluminum or stainless steel).
   2. Main Runners:
      a. Armstrong: Heavy Duty Prelude Conceal 7300, 15/16” exposed T.
      b. Hanger Wire: No. 12 gage non-ferrous wire.
   3. Cross Tees – “Stake-on end”, Stepped End:
      a. Armstrong: 15/16 exposed T.
   4. Concealed Tee Splines and Angles.
   5. Edge Trim:
      a. Armstrong Wall angle: 7800, 7/8” with BERC2 Retention Clip
      b. Structural Classification: ASTM C 635 Heavy Duty.
      c. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
   6. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
   7. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least time three design load, but not less than 12 gauge.
   8. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.
   9. Accessories:2ft Tee Spline

L. Compression Struts, one of the following:

1. Stud Design: Install a 20-gauge 4-inch stud. Attach to main runner with 2 #12 self-drilling self-tapping screws within 2 inches of splay intersection and to structure, with 2 #12 x 2 inch long screws to wood structure or 3/16-inch diameter expansion anchor at concrete/steel deck or 2 #10 x 1/2" self-tapping sheet metal screws to metal deck without concrete. Compression strut shall not replace hanger wire, refer to drawings. [DSA IR 25-2.13 Sheet No. 2.35.]
2. Pipe Design: Install a 12 GA. vertical hanger wire and tie to main runner no more than 2 inches from splay intersection. Run the hanger wire inside a sleeved 1/2-inch Electrical Rigid Steel Conduit or Steel Electrical Metallic Tubing (EMT) and 3/4 inch Electrical Rigid Steel Conduit (ERSC) or Steel Electrical Metallic Tubing (EMT) as indicated on drawings, extend tubes tight to structure above and ceiling grid below. To secure sleeved tubes drill a 5/32-inch hole and install through a 1/8-inch bolt with locking nut, tubes shall lap one another min. 4 inches in fully extended position. Cut a slot in the 3/4-inch conduit to straddle the main runner and secure with 2 #12 self-tapping sheet metal screws.
3. Install a USG DONN Compression Strut Posts, Model VSA18/30 for up to 30 inches plenum depth, Model VSA30/48 for up to 48 inches and VSA 48/84 for up to 84 inches and VSA84/102 for up to 102 inches. Provide required accessories for seismic requirements and secure per manufacturer's specifications. Compression strut post shall not replace hanger wire.
4. Truss Joists Design: Install web stiffeners at 24 inches long. Attach clip angle L 2-1/2 by 2-1/2 by 1/4 inches and secure to joist with 3/8 inch diameter bolts with washers, hang splay wire from angle with 3/8 inch eyebolt, secured with washers and nut. Attach 1/2 inch diameter galvanized pipe strut, maximum length 51 inches, to side of joist or web stiffener with1/4 inch diameter. Lag bolt and washer, provide spacer between pipe and joist/stiffener.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that existing conditions are ready to receive work.

B. Verify that layout of hangers will not interfere with other work.

C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install system in accordance with ASTM C636 and Section 5.2 of ASTM E580, CBC Sections 1616A.1.20 and as supplemented in this Section.

B. Measure each ceiling area and establish layout to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width grid panel at borders and comply with layout shown on reflected ceiling plans.

C. Exitways shall be installed in accordance with Section 13.5.6.2.2.(1) of ASCE 7-10 as amended by 2013 CBC Section 1616A.1.20. A main or cross runner shall be installed on all sides of each piece of tile, board or panel and each light fixture or grill. Splices and intersections of such runners shall be attached with through-connectors such as pop rivets screws, pins, plates with bent tabs or by other approved connectors.

D. Ceilings shall not support material or building components other than grilles or light fixtures except as herein provided. Ductwork, plumbing and like work shall have its own support system and shall not utilize the ceiling system or suspension wires.

E. No. 12 gage hanger wires may be used for up to and including 4 ft. by 4 ft. grid spacing and shall be attached to main runners.

F. Provide No. 12 gauge hanger wires at the ends of all main and cross runners within eight (8) inches of the support or within one-fourth (1/4) of the length of the end tee, whichever is least, for the perimeter of the ceiling area Perimeter wires are not required when the length of the end tee is eight (8) inches or less.

G. Ceiling grid members shall be attached to two (2) adjacent walls per ASTM E580 Section 5.2.3 Ceiling grid members shall be at least 3/4 inch clear of other walls. If walls run diagonally to ceiling grid system runners, one end of main and cross runners should be free, and a minimum of 3/4 inch clear of wall.

H. The width of the perimeter supporting closure angle shall be not less than 2 inches. Grid systems with specialty or proprietary angles and support clips may be acceptable in accordance with Acceptance of Evaluation Reports and meeting the requirements of CBC Section 1616A.1.20, ASTM C635, C636 and E580.

I. At the perimeter of the ceiling area, where main or cross runners are not connected to the adjacent wall, provide interconnection between the runners at the free end to prevent lateral spreading. A metal spreader strut or a No. 16 gage wire with a positive mechanical connection to the runner may be used and placed within 8 inches of the wall. Where the perpendicular distance from the wall to the first parallel runner is 8 inches or less, this interlock is not required.

J. Expansion Joints, Seismic Separation Joints, and Penetration:
   1. Expansion joints shall be provided in the ceiling at intersections of corridors and at junctions of corridors with lobbies or other similar areas.
   2. For ceiling areas exceeding 2500 square feet a seismic separation joint shall be provided to divide the ceiling into areas not exceeding 2500 square feet. Alternatively comply with ASTM E580, Section 5.2.9.
   3. Penetrations through the ceiling for sprinkler heads and other similar devices that are not integrally tied to the ceiling system in the lateral direction shall have a two (2) inch oversized ring, sleeve or adapter through the ceiling tile to allow free movement of one (1) inch in all horizontal directions. Alternatively, per ASTM E580, Section 5.2.8.5, a flexible sprinkler hose fitting that can accommodate one (1) inch of ceiling movement shall be permitted to be used in lieu of the oversized ring, sleeve or adapter.

K. Lateral Force Bracing:
   1. Lateral force bracing is required for all ceiling areas. The spacing of the bracing assemblies as indicated on drawings.
      a. Exception: Lateral force bracing may be omitted for suspended acoustical ceiling systems with a ceiling area 144 sq. ft. or less, when perimeter support, in accordance with Paragraph H above or with ASTM E580 Sections 5.2.2 and 5.2.3, are provided and perimeter walls are designed to carry the ceiling lateral forces.

2. Provide lateral-force bracing assemblies consisting of a compression strut and four (4) No. 12 gage splayed bracing wires oriented 90 degrees from each other.
3. The spacing of the bracing assemblies must be shown on the construction documents.
4. There shall be a brace assembly a distance not more than one half (1/2) the calculated spacing from the surrounding wall, expansion joint and at the edges of any ceiling vertical offset.
5. Bracing assemblies spaced at a maximum of 12 feet by 12 feet on centers for school buildings and 8 feet by 12 feet on centers for essential services buildings, and
6. The slope of bracing wires shall not exceed 45 degrees from the plane of the ceiling and wires shall be taut. Splices in wires are not permitted without special Approving Agency approval.
7. Compression struts shall be adequate to resist the vertical component induced by the bracing wires, and shall not be more than 1 (horizontal) in 6 (vertical) out of plumb.

8. The maximum slenderness ratio (kL/R) of the compression strut is 200 or less.

L. Attachment of Hanger and Bracing Wires:
1. Fasten hanger wires with not less than three (3) tight turns in three inches. Hanger wire loops shall be tightly wrapped and sharply vent to prevent any vertical movement or rotation of the member within the loops.
2. Fasten bracing wires with four (4) tight turns. Make all tight turns within a distance of 1-1/2 inches.
3. Hanger or bracing wire anchors to the structure should be installed in such a manner that the direction of the anchor aligns as closely as possible with the direction of the wire.
4. Separate all ceiling hanger and bracing wires at least six (6) inches from all un-braced ducts, pipes, conduits, etc.
5. Hanger wires shall not attach to or bend around interfering materials or equipment. Provide trapeze or other supplementary support members at obstructions to typical hanger spacing. Provide additional hangers, struts or braces as required at all ceiling breaks, soffits, or discontinuous areas.
6. Hanger wires that are more than 1 (horizontal) in 6 (vertical) out of plumb shall have counter-sloping wires. Perimeter hanger wires at main runners that are positively attached to the perimeter closure angle, counter-sloping is optional.
7. When drilled-in concrete anchors or shot-in anchors are used in reinforced concrete for hanger wires, 1 of 10 wire/anchor assemblies must be field tested for 200 lbs. in tension. When drilled-in concrete anchors are used for bracing wires, 1 out of 2 wire/anchor assemblies must be field tested for 440 lbs. in tension in the direction of the wire. Power actuated fasteners in concrete are not permitted for bracing wires.

M. Ceiling Fixtures, Terminals, and Devices:
1. All fixture, terminals, and other devices shall be mounted in a manner that will not compromise ceiling performance in accordance with Section 13.5.6.2.2(5) of ASCE 7-10 as amended by 2013 CBC Section 1616A.1.20 (1616.10.16) and ASTM E580 Sections 5.3 and 5.4.

2. Attach all light fixtures and ceiling mounted air terminals, to the ceiling grid runners to resist a horizontal force equal to the weight of the fixtures. Screws or approved fasteners are required.
3. Ceiling panels shall not support any light fixtures, air terminals or devices.
4. All light fixtures shall be positively attached to the ceiling suspended systems by mechanical means to resist a horizontal force equal to the weight of the fixture. Screws or approved fasteners are required. A minimum of two attachments are required at each light fixture, per ASTM E580, Section 5.3.1.
5. Light fixtures weighing less than or equal to 10 lb shall have a minimum of (1) #12 gauge slack safety wire connected from the fixture housing to the structure above.
6. Light fixtures weighing greater than 10 lbs but less than 56 lbs may be supported directly on the ceiling runners, but they shall have a minimum of two (2) #12 gauge slack safety wires connected from the fixture housing at diagonal corners and anchored to the structure above.
7. Light fixtures weighing greater than 56 lbs. shall be independently supported by not less than four (4) taut No. 12 gauge wires, each attached to the housing and to the structure above. The four (4) # 12 taut #12 wires, including their attachment to the structure above, must be capable of supporting four (4) times the weight of the unit.
8. Surface-mounted fixtures shall be attached to the main runner with at least two positive clamping devices made of material with a minimum #14 gauge. Rotational spring catches do not comply. A #12 gauge suspension wire shall be attached to each clamping device to the structure above. Provide additional supports when light fixtures are eight (8) feet or longer. Maximum spacing between supports shall not exceed eight (8) feet.
9. Support pendant-mounted light fixtures directly from the structure above with hanger wires or cables passing through each pendant hanger and capable of supporting two (2) times the weight of the fixture. A bracing assembly is required where the pendant hanger penetrates the ceiling. If the pendant mounted light fixture is directly and independently braced below the ceiling, i.e. aircraft cables to walls, then brace assembly is not required above the ceiling.
10. If the pendant mounted light fixture is not directly and independently braced below the ceiling, than a bracing assembly is required where the pendant hanger penetrates the ceiling. Special details are required to attach the pendant hanger to the bracing assembly to transmit horizontal force. Exception: where the weight of the fixture is less than 20 pounds, the compression strut is not required.
11. Rigid conduit shall not be used for attachment of the fixtures.

N. Partitions: If non-bearing partitions that extend to and terminate at a suspended ceiling are supported laterally by opposing bracing wires spaced a maximum of 8 ft oc along the top edge of the partition or by other equivalent means, they shall be considered as not adding to the lateral load required to be resisted by the ceiling system.

O. Do not eccentrically load system or produce rotation of runners.

P. Install edge angle at intersection of ceiling and vertical surfaces using longest practical lengths. Miter corners. Provide edge angles at junctions with other interruptions. Where curved obstructions occur, provide preformed closers to match edge molding.

Q. Form expansion joints as indicated on drawings.

R. Install Hold Down Clips at fire-rated panels weighing less than 1 psf, , metal ceiling panels and panels weighing more than 1/2 psf other than acoustical panels.

S. Install Suspension Accent Trims per manufacturer's instructions including all related accessories.

T. Install Stabilizer Clips at panels 5' and longer at mid point of panel.

3.03 ADDITIONAL REQUIREMENTS

A. For Metal and Other Panels: Metal panels and panels weighing more than ½ psf, other than mineral fiber acoustical tile, are to be positively attached to the ceiling suspension runners.

B. For Suspended Acoustical Ceilings Below Gypsum Board Ceilings: Where gypsum board or other ceiling finishes are attached to the framing, specific details will be required for the vertical hanger wire and lateral bracing wire support connections to the framing.

3.04 TESTING

A. When drilled-in concrete anchors or shot-in anchors are used in reinforced concrete for hanger wires, 1 out of 10 must be field tested for 200 pounds of tension.

B. Test drilled-in expansion-type concrete anchors for bracing wires, 50% bolt in a group must be field tested for 440 pounds in tension.

C. Shot-in anchors in concrete are not permitted for bracing wires.

D. If any shot-in or drilled-in anchors fails, conform to Section 1916A.7 2013 California Building Code.

3.05 TOLERANCES

A. Variation from Flat and Level Surface: 1/8 inch in 10 feet.

END OF SECTION

SECTION 09 65 13

RESILIENT BASE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Resilient base, rubber.

B. Accessories.

C. Related Sections
   1. Section 09 06 00, Schedules for Finishes.

1.02 REFERENCES

A. ASTM E648 and NFPA 253 - Critical Radiant Flux of Floor Covering Systems.

B. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials

C. ASTM F1861 - Resilient Wall Base

D. SCAQMD - South Coast Air Quality Management District Regulations Rule 1168 Adhesive and Sealant Applications

1.03 FIRE CLASSIFICATION REQUIREMENTS

A. ASTM E648, NFPA 253: Class 1, Critical Radiant Flux Flame Spread Value: minimum 0.45 watts per sq cm.

B. ASTM E84, smoke density less than 450.

1.04 SUBMITTALS

A. Product data on specified products and colors available.

B. Three 6 inch long samples of base material for each color selected.

C. Manufacturer's installation instructions.

D. Maintenance procedures and recommended maintenance materials.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain minimum 70 degrees F temperature three days prior to, during and 24 hours after installation of materials.

C. Provide adequate ventilation to carry off volatile fumes.

1.06 WARRANTY

A. Submit under provisions of Division 01, General Requirements.

B. Provide manufacturer's 1 year warranty against defects and wear-through.

1.07 REPLACEMENT MATERIALS

A. Provide minimum three percent of all materials furnished for each color and size of materials installed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS, RUBBER

A. Johnsonite, Chagrin Falls, OH.

B. Burke Mercer Flooring Products, San Jose, CA.

C. Nora Flooring Systems, Lawrence, MA.

D. Endura Co., Waltham, MA.

E. Roppe Corp., Fostoria, OH.

F. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.02 BASE MATERIALS

A. Base: Rubber vinyl, 1/8 inch gauge, standard toe, 4 inches.

B. Base material shall meet ASTM F1861 Type TS for rubber base, Group I or II, Style A Straight (toeless) profile for carpet and Style B Coved profile for hard surface floors .

C. Base Accessories: size and color as base.

D. Adhesive: As recommended by the manufacturer and if full compliance with the California VOC regulations.

E. Non-aerosol adhesives applied on-site shall comply with VOC content limits defined by SCAQMD Rule 1168. Aerosol adhesives shall comply with VOC contents limits by Green Seal Standard GS-36.

F. Colors: As selected by the Architect from manufacturer's standard list of colors.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft and are ready to receive Work.

B. Verify that surfaces are finished, ready to receive base installation.

C. Beginning of installation means acceptance of existing substrate and site conditions.

3.02 INSTALLATION - BASE MATERIAL

A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.

B. At 90 degree external corners: Cut from 120 foot rolls only, do not use 4 foot segments. At corners more or less than 90 degrees, shave a vertical strip down the back side of the material, 1/4 inch wide and not more than 1/2 the thickness at the point of bend. Bend coved toe to required angle. Bond material firmly to wall on both sides of joint to ensure a tight fit with no open void at top.

C. Inside Corners: Cut an inverted V-shaped notch in the toe of the wall base at the place where the corner is to be formed. Bend the base once or twice at a right angle to shape the corner. Form the corner and check the fit. Apply adhesive completely to the back of the base and to the wall area to be covered by the corner. Press firmly in position on and roll with a small hand roller.

D. Pre-molded units will not be accepted.

E. At 90 degree external corners: Use pre-molded units.

F. At 90 degree internal corners: use pre-molded units only.

G. Install base on solid backing. Bond tight to wall and floor surfaces.

H. Scribe and fit to door frames and other interruptions.

3.03 CLEANING

A. Remove excess adhesive from floor, base and wall surfaces without damage.

B. Protection: Protect work until completion. Repair or make good any damage to this work and other materials damaged during installation of base material.

3.04 SCHEDULE

A. Install at all walls not specified to receive integral base and as scheduled in the finish schedule.

B. Do not apply base to toe kick at casework.

END OF SECTION

SECTION 09 65 19

RESILIENT TILE FLOORING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Accessories

C. Related Sections
1. Section 09 06 00, Schedules for Finishes.

1.02 REFERENCES

A. ASTM - American Society for Testing and Materials
1. ASTM E648 and NFPA 253 - Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
2. ASTM D2047 - Static Coefficient of Friction.
3. ASTM F1066 Standard Specification for Vinyl Composition Floor Tile.
4. ASTM F 1869 - Test Method for Measuring Moisture Vapor Emission.
5. ASTM F 2170 - Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes.
6. ASTM E84, Test Method for Surface Burning Characteristics for Building Materials.

B. ADA - Americans with Disabilities Act of 1990
1. ADA Standards - ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.

C. SCAQMD - South Coast Air Quality Management District Regulations Rule 1168 Adhesive and Sealant Applications.

1.03 FIRE CLASSIFICATION REQUIREMENTS

A. ASTM E648, NFPA 253: Class I, Critical Radiant Flux: Minimum 0.45 watts per sq cm.

B. Flame spread not greater than 25 and smoke density not greater than 450 when tested in accordance with ASTM E84.

1.04 SUBMITTALS

A. Product data on specified products, describing physical and performance characteristics, sizes, patterns and colors available.

B. Three samples, 12 by 12 inches in size, illustrating color and pattern for each floor material specified.

C. Manufacturer's installation instructions.

D. Maintenance procedures and recommended maintenance materials, and suggested schedule for cleaning, stripping and re-waxing.

E. Moisture and Alkalinity test results.

1.05 MOISTURE AND ALKALINITY TESTING

A. Contractor shall test all concrete floors to receive resilient flooring for moisture content as described in Division 01, General Requirements for Quality Requirements and this Section.

B. Notify Inspector 24 hours prior to installation of testing and at conclusion of tests.

C. Test concrete flooring in accordance with ASTM F1869 or ASTM F 2170.

D. Submit test results and data to Owner and Architect for approval prior to installation of flooring materials.

1.06 WARRANTY

A. Submit under provisions of Division 01, General Requirements.

B. Provide manufacturer's 5 year warranty against defects and wear-through.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain minimum 70 degrees F temperature three days prior to, during and 24 hours after installation of materials.

C. Provide adequate ventilation to carry off volatile fumes.

1.08 EXTRA MATERIALS

A. Provide minimum three percent of all materials furnished for each color and size of materials installed.

B. Maintenance Materials and Supplies: Provide instructions for maintenance of flooring from the manufacturer [and 5 gallons of] including cleaning solution, sealer and floor polish recommended by manufactures.

1.09 MAINTENANCE

A. Unless badly soiled or scratched, clean, seal and polish vinyl composition tile in accordance with this section.

B. Use only approved brushes to maintain polished finish.

C. Coordinate selection of floor polish with Owner's custodial maintenance representative.

PART 2 - PRODUCTS

2.01 MANUFACTURERS - TILE FLOORING

A. Products of the following manufacturers form the basis for design and quality intended.
   1. Armstrong World Industries, Inc., Fullerton, CA.
   2. Azrock by Tarkett Commercial, Houston, TX.
   3. Mannington Commercial, Calhound, GA.

B. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.02 TILE FLOORING MATERIALS

A. ARMSTRONG STANDARD EXCELON IMPERIAL TEXTURE , AZROCK CORTINA ASTM F1066, Class 2/II, 1/8 (.125) inch thick, 12 by 12 inch size, homogeneous composition tile, pattern uniformly dispersed throughout thickness of material. Colors: 4 colors minimum.
   1. Required Static Load Limit: 75 pounds per square inch.
   2. Static Coefficient of Friction: ASTM D2047, minimum 0.6 COF for level surface conditions, CBC 1124B.1/Standards 4.5.1.

B. Subfloor Leveler System: Johnsonite LS-40, pieces to fit transition condition. Install per manufacture's specifications.

C. Refer to Section 09 06 00, Schedules For Finishes.

2.03 MANUFACTURERS - REDUCER STRIPS AND ACCESSORIES

A. Products of the following manufacturers form the basis for design and quality intended.
   1. Johnsonite, Chagrin Falls, OH
   2. The Roppe Co., Fostoria, OH.
   3. Mercer Products Co., Inc., Orlando, FL.
   4. The Flexco Co., Tuscumbia, AL.
   5. AFCO Rubber Corp., North Canton, OH.

B. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.04 REDUCER STRIPS AND ACCESSORIES

A. Reducer Strip: JOHNSONITE, vinyl RRS-XX-C (1/8”), RRS-XX-B (.080”) or RRS-XX-A (1/16”) for thickness of flooring tile.

B. Edge Guards and Adapters: JOHNSONITE EG and CTA Series, thickness on each side of strip to accommodate type of flooring material to be jointed.

2.05 FILLERS AND ADHESIVES

A. Subfloor Filler: Armstrong S-194 FLOOR PATCH [Mannington M-Guard V-11/Full Spread] or Ardex SD-F Feather Finish and Primer P-51 for concrete, P-82 for non-porous subfloors or wood and as recommended by the manufacturer of finish flooring.

B. Adhesives: Armstrong S-750 and as recommended by the manufacturer and in full compliance with California VOC regulations.
   1. Adhesives shall comply with VOC content limits defined by SCAQMD Rule 1168

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft, and are ready to receive Work.

B. Prior to ordering resilient sheet flooring, conduct Calcium-Chloride Test Method in accordance with ASTM F1869 to verify that concrete floor slabs are dry with maximum moisture vapor emissions of 3 pounds per 1,000 square feet in 24 hours and that slabs exhibit negative alkalinity, carbonation or dusting. Apply the moisture test in four (4) different areas of each floor location, with at least one test for each 1,000 square feet of floor area.

C. Prior to ordering resilient flooring conduct Relative Humidity Test Method in accordance with ASTM F 2170 to verify relative humidity and surface pH in accordance with ASTM F710 of concrete floor slabs, the method
   1. Requires drilling holes at diameter not to exceed outside diameter of probe by more than 0.04 inch to depth equal to 40 percent of slab's thickness (elevated structural slab shall be tested at depth equal to 20 percent of slab thickness).
   2. Place probe to full depth of test hole, place cap over probe.
   3. Permit test site to acclimate, or equilibrate, for 72 hours prior to taking relative humidity readings.
   4. Remove cap and press button on the probe to obtain reading.
   5. Relative humidity readings for substrates receiving non-permeable flooring are 75 percent or lower.
   6. Testing shall require 3 tests in first 1,000 square feet, with one additional test per each additional 1,000 square feet of concrete slab surface.
   7. Alkalinity testing: follow procedures per ASTM F710, ranges shall not exceed those recommended by the flooring manufacturer.

D. Alkalinity Testing: Concrete floors shall be tested for alkalinity prior to the installation of resilient flooring. Levels of pH shall not exceed the written recommendations of the resilient flooring manufacturer or the adhesive manufacturer, or both.

E. Ordering of flooring materials and beginning of installation means acceptance of existing substrate and site conditions.

3.02 PREPARATION

A. Preparation of Floors - Concrete substrate: Surfaces to receive tile shall be scraped of foreign deposits. Subfloor filler shall be applied to the extent necessary to bring all depressions smooth and level.

B. Preparation of Floors - Wood Floors: Surfaces to receive tile shall be scraped of foreign depressions up to existing grade. Nail or staples shall not protrude above the surface of the wood. All depressions from nails, staples or gouges shall be filled in.
   1. Preparation for Underlayment - Subfloor areas that have been asbestos abated shall be securely fastened, structurally sound and free of all foreign matter and projections. Reset any protruding nails. Subfloor shall be patched as necessary to fill gouges, level uneven areas prior to underlayment installation. Strictly adhere to manufacturer installation instructions.
   2. Provide site specific written underlayment warranty from manufacturer.

C. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, feather edges and fill other defects with subfloor filler.

D. Apply, trowel and float filler to leave a smooth, flat, hard surface, free of bumps or depressions of any size.
   1. Latex Underlayment - Latex modified, Portland cement based formulation or approved by flooring manufacturer for applications indicated. Ardex SD-F or equal. Product that will not disintegrate from moisture, for floor areas less than 1/4 inch buildup. All products shall be 100 percent asbestos-free.

E. Inspection - After floor surface has been prepared as described above and before application of adhesive, contractor must notify Inspector on any evidence of possible moisture problems.

F. Prohibit traffic from area until filler is cured.

G. Vacuum clean substrate.

H. Apply primer as recommended by the materials manufacturer.

3.03 INSTALLATION - TILE MATERIAL

A. Install in accordance with manufacturers' instructions.

B. Mix tile from container to ensure shade variations are consistent.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Set flooring in place, press with heavy roller to attain full adhesion.

E. Lay flooring with joints parallel to building lines.

F. Install tile to square grid pattern with all joints aligned, with pattern grain alternating with adjacent unit to produce basket weave pattern. Allow minimum 1/2 full size tile width at room or area perimeter, where possible.

G. Terminate flooring at centerline of door at door openings where adjacent floor finish is dissimilar.

H. Install edge strips at unprotected or exposed edges, and where flooring terminates.

I. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints.

J. Install flooring under movable partitions and under open cabinets without interrupting floor pattern.

K. Install edge strips where flooring does not terminate at walls and where indicated. Fit joints tightly.

L. Install wall base in accordance with Section 09 65 13.

M. Installation of Vinyl Composition Tile - Shall meet manufacturer's written installation specifications and industry standards. Finish product shall have tiles of equal width at opposite edges of room. Avoid cut widths that equal less than one-half of a tile at the perimeter. Tiles, when cut, shall butt neatly and tightly to vertical surfaces and permanent fixtures, including edgings, thresholds and nosing.

N. Installation of Cove Base - Install after floor tile is in place. Edges to align top and bottom, and joints to fit tight.

O. Installation of Reducers, Transitions or Edging Strips - Provide at all edges not covered by trim and at wall openings where abutting other finish flooring. Where doors occur, center edging strip below center of door.

P. Final Inspection - Prior to final inspection the contractor shall clean up the job site and remove all rubbish and debris. Remove excess adhesive from floor, base, and wall surfaces. Floors are to be cleaned and readied for the appropriate finish.

3.04 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. Apply protective floor polish to floor surfaces that are free from soil, visible adhesive, and surface blemishes.

C. Cover products installed on floor surfaces with undyed, untreated building paper until final inspection.

D. Use of dollies with boards underneath whenever normally stationary equipment and/or furnishings must be moved across the floor.

E. Protect floors from rolling loads for 72 hours after installation by covering with hardboard or plywood.

3.05 CLEANING

A. Remove excess adhesive from floor, base and wall surfaces without damage.

B. Maintenance immediately after installation.
   1. Sweep or vacuum floor thoroughly.
   2. Damp mop with a solution of a neutral detergent such as Armstrong S-485 Floor Cleaner, carefully wiping up black marks, use a scrubbing pad or brush as recommended for the type of floor being maintained.
   3. When the floor is thoroughly cleaned, rinsed and dried, apply two coats of sealer equal to Armstrong S-495 Floor Sealer followed by four coats of a high-quality commercial floor polish equal to Armstrong S-480 Floor Polish (except on Step Master). Allow 8 hours drying time between coats of sealer and finish. Do not allow traffic on the floor for minimum 8 hours.
   4. After the last coat of floor finish has dried sufficiently according to the manufacturer's instructions, burnish work, using high speed equipment, in accordance with manufacturer's written instructions to bring the entire surface, including the corners and edges, to high level of luster, free of all types of marks and dust embedded in finish.
   5. Clean adjacent baseboard and other surfaces of adhesive and other materials. Replace damaged or defective Work to the specified condition.
   6. Do not wash, scrub or strip the floor for at least four to five days after installation.

C. Protection: Cover Work with a heavy non-asphaltic non-staining type building paper where subsequent building operations occur. Protect Work until completion. Repair or make good any damage to this Work and other materials damaged during installation of flooring.

END OF SECTION

SECTION 09 90 00

PAINTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Fluid applied paints and coatings. Upon completion of Work, all visible interior and exterior surfaces, within the Contract limits including factory primed or factory finished roof mounted mechanical and electrical equipment, shall be painted unless scheduled “Not to Be Painted” in this Section.
   1. Each paint system includes:
      a. Surface preparation, including touch-up of shop applied primers, if needed.
      b. Prime coat application, where scheduled as part of finish system.
      c. Finish coat application, where scheduled apply two or more finish coats.
   2. Paint semi-concealed areas (e.g. inside of light troughs and valances, behind grilles, and projecting edges above and below sight lines, behind wall-mounted items).
   3. Repair and Painting of existing surfaces.
   4. Surface preparation and repair of surfaces treated for lead-based paint abatement work.

B. Surfaces Not To Be Painted:
   1. Prefinished wall, ceiling, and floor coverings.
   2. Items with factory-applied final finish except roof-mounted equipment as defined above.
   3. Concealed ducts, pipes, and conduit.
   4. Glass, plastic laminate, ceramic tile, anodized aluminum.
   5. Surfaces of steel items that will be embedded in concrete.
   6. Surfaces specifically scheduled or noted on the Drawings not to be painted.
   7. Fire-Rating labels on doors and frames.
   8. Performance Rating labels on equipment.
   9. Nameplates, cable or device identification labels, code required signage, etc.

C. Related Sections:
   1. Section 09 01 90, Repair and Painting Existing Previously Painted Surfaces

1.02 REFERENCES

A. ASTM International - American Society for Testing and Materials:
   1. ASTM D 4442 - Direct Moisture Content Measurement of Wood and Wood-Base Materials.
   2. ASTM D 4444 - Use and Calibration of Hand-Held Moisture Meters
   3. ASTM D 6386 - Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting

B. AQMD - Air Quality Management District
   1. AQMD Regulations – Local Regulations

C. SCAQMD – South Coast Air Quality Management District
   1. SCAQMD-1113 - Rule 1113, Architectural Coatings

D. SSPC - Steel Structures Painting Council.

1.03 SUBMITTALS

A. Product Data: For each paint system product and accessory item

B. Samples: Of each specified finish system color, texture, and sheen; samples shall be minimum 8-1/2 by 11 inches in size.
   1. Prepare transparent wood finish samples on type and quality of wood specified.

C. Certified Copies of moisture test results

D. Information Submittals
   1. Statement of Qualifications from manufacturer
   2. Statement of Qualifications from installer
   3. Manufacturer's application instructions.

E. Closeout Submittals
   1. Material Safety Data Sheets.

F. Submit Qualifications data for manufacturer and applicator required under Quality Assurance.

1.04 MAINTENANCE MATERIALS SUBMITTALS

A. For each color, type, and gloss of paint used in the work provide, as Extra Materials, a quantity equal to approximately 10 percent of the quantity required for its installation rounded to the nearest gallon, or five gallons, whichever is less.
   1. Extra Materials shall be from same production run as installed materials.
   2. Label each container with locations and dates of related installations; do not obscure manufacturer's label.
   3. Deliver Extra Materials to Site as directed by Owner after providing 24 hours notice of delivery.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications: Company with minimum 10-years' experience manufacturing quality paint and finish products for commercial projects similar in scale and complexity to those required for this Project.

B. Applicator Qualifications: Company with minimum 5-years' experience painting and finishing commercial projects similar in scale and complexity to those required for this Project.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site in their original, sealed, undamaged containers with labels intact and legible.

1. Labels shall include manufacturer's name, type of paint, brand name, brand code, color designation, recommended surface preparation, typical coverage, drying times, cleanup procedures, and instructions for mixing and reducing, if permitted.

B. Store paint materials ambient temperatures between 45- and 90-degrees F, in well ventilated area unless permitted otherwise by manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Supply continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during and 48 hours after application of finishes, unless permitted otherwise by manufacturer's instructions.

B. Do not apply exterior coatings during rain, or when relative humidity is above 50 percent, unless permitted otherwise by manufacturer's instructions.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

D. Minimum Application Temperature for Varnish and transparent Finishes: 65 degrees F for interior or exterior, unless permitted otherwise by manufacturer's instructions.

E. Maintain lighting level sufficient to conduct painting operations.

F. Provide District 72 hour notice prior to the start of any painting operations.

1.08 GUARANTEE

A. Guarantee the painting Work against peeling, fading, cracking, blistering or crazing for a period of two years from the Date of Certified Completion for painting of new surfaces and existing surfaces.

PART 2 - PRODUCTS

2.01 PAINTS AND COATINGS

A. Acceptable Manufacturer. Products of following manufacturer form basis for design and quality intended.
   1. Vista Paint Corporation, Fullerton, CA
   2. Or approved equal.
      a. Any deviation from Vista Paint shall be noted prior to application.

2.02 MATERIALS

A. Coatings: Ready mixed, except field-catalyzed coatings. Process pigments to soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.

B. Colors and Glosses: As selected by Architect from manufacturer's full range of available colors. Architect will select color and hue to be used in various types of paint specified and will be sole judge of acceptability of various glosses obtained from materials proposed to be used in Work. During actual painting, Architect may make minor modifications in tone and shade to adjust for actual surface and lighting conditions encountered.

C. Undercoats and Thinners. Provide undercoat paint produced by same manufacturer as finish coat. Use only thinners recommended by paint manufacturer and use only to recommended limits. Use undercoat, finish coat and thinner material as parts of a unified system of paint finish.

D. Coatings: Good flow and brushing properties; capable of drying or curing free of streaks or sags.

E. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified of commercial quality.

2.03 APPLICATION EQUIPMENT

A. For application of the approved paint, use only such equipment as is recommended by the manufacturer.

B. Compatibility: Prior to actual use of application equipment, use all means necessary to verify that the proposed equipment is actually compatible with the material to be applied and that the integrity of the finish will not be jeopardized by use of the proposed application equipment.

2.04 FINISHES

A. Refer to schedule at end of Section for surface finish. Notwithstanding product numbers listed in schedule, Contractor shall conform to most recent product numbers as published by the manufacturer.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of Work. Report any condition that may potentially affect proper application.

C. Measure moisture content of new surfaces using an electronic moisture meter. Apply finishes only when moisture content of surfaces are below the following maximums. Conduct moisture measurements in presence of the project inspector when inspector is assigned to the project, document readings and submit to Architect under Part 1.
   1. Plaster and Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 Percent.

3. Interior Located Wood: 15 percent, measured in accordance with ASTM D 4442 and ASTM D 4444.
4. Exterior Located Wood: 19 percent, measured in accordance with ASTM D 4442 and ASTM D 4444.

D. Beginning installation means acceptance of existing surfaces and conditions.

3.02 MATERIALS PREPARATION

A. Mix and prepare painting material in accordance with manufacturer's recommendations.

B. Store materials not in actual use in tightly covered containers.

C. Maintain containers used in storage, mixing and application of paint in a clean condition, free from foreign materials and residue.

D. Stir all materials before application to produce a mixture of uniform density and as required during the application of materials. Do not stir into the material any film that may form on the surface. Remove the film and strain the material before using.

3.03 SURFACE PREPARATION

A. Remove electrical plates, hardware, light fixture trim and fittings prior to preparing surfaces for finishing.

B. Correct minor defects and clean surfaces which surfaces which affect Work of this section.

C. Shellac and seal marks that may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Insulated Coverings: Remove dirt, grease and oil from canvas and cotton.

F. Gypsum Board Surfaces: Fill minor defects, joints and nail head depressions with spackling compounds. Prime in accordance with primer manufacturer's recommendations.

G. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering or corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
1. Concrete Floors: etch existing concrete bare floors with 5% Muriatic Acid solution where scheduled to be painted.

H. Plaster Surfaces: Fill hairline cracks, small holes and imperfections with patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

I. Surface Preparation for Exterior Metal (Except Galvanized): Preparation in accordance with SSPC-6 Commercial Blast Cleaning.

J. Galvanized Surfaces:
   1. Prepare galvanized steel and nonferrous metal surfaces in accordance with ASTM D 6386-Surface Preparation of Galvanized Surfaces and manufacturer's instructions.
   2. Ensure surfaces are dry.
   3. Interior Exposure (Dry/Benign): Remove visible oil, grease, dirt, dust, protective mill coatings, and other soluble contaminants in accordance with SSPC-SP 1 or manufacturer's instructions as specified for coating system. Hand or Power tool clean to remove all insoluble contaminants
   4. Interior and exterior Exposure (moderate to severe): Remove visible oil, grease, dirt, dust, protective mill coatings, and other soluble contaminants in accordance with SSPC-SP 1 or manufacturer's instructions as specified for coating system. Follow initial cleaning with one of the following Methods:
      a. SURFACE PREPARATION METHOD A (Preferred): Thoroughly roughen the entire surface to be coated using compressed air brush off blast cleaning with a fine abrasive to achieve a uniform anchor profile of 1-2 mils. Reference ASTM D 6386-99 Section 5.4.1.
      b. SURFACE PREPARATION METHOD B (Alternate method when Method A is not feasible): Chemically treat with one of the following products to etch the galvanized surface to be coated: Henkel Galvaprep 5 or Clean & Etch by Great Lakes Laboratory. Reference ASTM D 6386-99 Section 5.4.2.

K. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime paint after repairs with Tnemec Series L69 Hi Build Epoxoline II or Carboline 890 VOC or approved in accordance with Division 01, General Requirements for Substitutions.

L. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Spot prime bare steel surfaces to match existing primer.

M. Wood Scheduled to Receive Paint Finish: Remove dust, grit and foreign matter. Seal knots, pitch streaks and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied.
   1. Exterior wood: apply wood preservative coats prior to paint system.

N. Wood Doors and Cabinet Work scheduled for field-applied transparent or solid stain finish:
   1. Sand surfaces thoroughly with a 5/0, 180 grit sandpaper.
   2. Apply coatings as specified in the schedule to all surfaces, sides and edges. Avoid streaking or uneven application Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail or screw holes, or other surfaces imperfections.
   3. Stains as selected by Architect from manufacturer's full range of colors.

O. Provide satin finish for final coats.

P. Wood Doors Scheduled for Painting: Seal top and bottom edges with primer. Leave labels intact and readable.

Q. Glue-Laminated Beams: Prior to finishing, wash surfaces with solvent. Remove grease and dirt.

R. Exterior Wood-Clear coats: apply exterior grade varnish.

S. Door and Window Frames, Side Lites, jambs and headers: clean and light sand smooth.

T. Vinyl Wall Covering: Remove grease, dirt, oil, wax, and other foreign matter from surfaces by washing with warm solution of household detergent followed by wet sponge, and allowing to dry thoroughly.

U. Previously Coated Surfaces: As required in Section 09 01 90. Painting over existing painted surfaces interior and exterior, ascertain that new paint system is compatible with existing gloss and high-gloss oil based paint system to insure proper adhesion. Sand lightly existing paint and prime walls as scheduled.

3.04 PROTECTION

A. Protect elements surrounding the Work of this Section from damage or disfiguration.

B. Repair damage to other surfaces caused by Work of this Section.

C. Furnish drop cloths, shields and protective methods to prevent spray or droppings from disfiguring other surfaces.

D. Remove empty paint containers from site.

3.05 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish. Number of coats specified is a minimum. Additional coats shall be applied at no extra cost, if coatings show evidence of uneven application, uneven pigmentation, brush strokes or otherwise unsatisfactory distribution of material.

D. Sand lightly between coats to achieve required finish.

E. Allow applied coat to dry before next coat is applied.

F. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

G. Prime back surfaces of interior and exterior woodwork with primer paint.

H. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.

I. Seal Tops, bottoms and cutouts for hardware and accessories of wood doors and plastic-laminate covered doors.

J. Paint Frames: Split paint door frames to match color of walls on each side of opening unless directed otherwise by Architect.

K. Paint finish shall continue through behind all wall-mounted items (e.g. markerboards, chalk and tack boards).

3.06 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Section Divisions 22, 23 and 26 for color coding and identification banding requirements of equipment, ductwork, piping and conduit.

1. Unless otherwise indicated, conform to the following color coding system:

PIPING	COLOR	MANUFACTURER
Chilled Water	Vista Gray	
Condenser Water	Canvas Tan	
Domestic Hot Water	Admiral Blue	
Domestic Cold Water	Edison Blue	-
Clinical Air	Bright Yellow	
Plant Air	Clear Lacquer	-
Vacuum	Shasta White	-
Oxygen	John Deere Green	Coast to Coast 555-2221-2744-02 Rustoleum H-3 -matches 594 green Pittsburgh 9-15
Nitrous Oxide	OSHA Blue	OSHA'S Website
Cold Soft Water	OSHA Violet	OSHA'S Website
Steam	Caterpillar Yellow	Rustoleum H-4
Hot Water	Ferguson Gray	Rustoleum Navy Gray - matches H-7
Soil Waste	Loam Brown	-
Nitrogen	OSHA Black	OSHA'S Website
Fire	OSHA Red	OSHA'S Website
Fuel Gas	OSHA Orange	OSHA'S Website

2. Deionized Water Light Blue Verify appropriate specific color designations with paint manufacturer.
3. Conform to Owner's special requirements for color coding. Match existing coding system where required.

B. Paint shop primed equipment.

C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

D. Paint mechanical wall louvers, grilles to match adjacent wall surfaces at accent paint finish.

E. Prime and paint insulated and exposed pipes, electrical equipment including panelboards and switch gear, conduit, boxes, insulated and exposed ducts, hangers, metal louvers, brackets, collars and supports, when exposed to view in finished occupied spaces. Except items that are pre-finished.

F. Replace identification markings on mechanical or electrical equipment when painted accidentally.

G. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint dampers exposed behind louvers and grilles to match face panels.

H. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

I. Color code equipment, piping, conduit and exposed ductwork in accordance with requirements indicated. Color band and identify with flow arrows names and numbering, using stencils or other approved systems.

J. Replace electrical plates, hardware, light fixture trim and fittings removed prior to finishing.

3.07 CLEANING

A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.

B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials and debris.

C. Collect cotton waste, cloths, and material that may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.08 FINISH SYSTEM SCHEDULE - EXTERIOR EXPOSURE (VISTA PAINT)

A. Wood - Flat - Acrylic
   1. Primer, 1 Coat 4200 Terminator II
   2. Finish, 2 Coats 2000 Duratone

B. Wood - Semi-Gloss – Acrylic
   1. Primer, 1 Coat 4200 Terminator II
   2. Finish, 2 Coats 8400 Carefree Semi-Gloss

C. Wood - Gloss – Acrylic
   1. Primer, 1 Coat 4200 Terminator II
   2. Tie Coat, 1 Coat 8500 Carefree Gloss
   3. Finish, 1 Coat 8500 Carefree Gloss

D. Wood - Stain –Semi- Transparent – Alkyd/Acrylic
   1. Stain, 2 Coats Benjamin Moore N638 Arborcoat
      a. Distributed by Vista Paint

E. Wood - Stain - Solid – Acrylic
   1. Stain, 2 Coats 3000 Acribond

F. Wood - Clear – Varnish Water-Base, Semi-Gloss finish
   1. Finish, 3 Coats – Defthane Water Base Polyurethane

G. Wood - Waterproofing Sealer - Clear (2 mils min. DFT)
   1. Sealer, 1 Coat Olympic Waterguard 55260

H. Wood - Preservative - Clear finish under paint system scheduled
   1. Sealer, 2 Coats Monochem Aquaseal II for Wood
   2. Then apply Wood Semi-Gloss Acrylic paint system.

I. Concrete - Flat - Acrylic
   1. Primer, 1 Coat 4600 Uniprime II
   2. Finish, 2 Coats 3000 Acribond

J. Concrete - Low Sheen - Acrylic
   1. Primer, 1 Coat 4600 Uniprime II
   2. Finish, 2 Coats 8300 Carefree Eggshell

K. Concrete - Elastomeric
   1. Primer, 1 Coat 4600 Uniprime II
   2. Finish, 2 Coats 500 Solotex

L. Concrete Block - Flat - Acrylic
   1. Primer, 1 Coat 018 Acrylic Block Filler
   2. Finish, 2 Coats 3000 Acribond

M. Concrete Block - Low Sheen - Acrylic
   1. Primer, 1 Coat 018 Acrylic Block Filler
   2. Finish, 2 Coats 8300 Carefree Eggshell

N. Concrete Block – Semi-Gloss - Acrylic
   1. Primer, 1 Coat 018 Acrylic Block Filler
   2. Finish, 2 Coats 8400 Carefree Semi-Gloss

O. Concrete Block – Gloss - Acrylic
   1. Primer, 1 Coat 018 Acrylic Block Filler
   2. Finish, 2 Coats 8500 Carefree Gloss

P. Concrete Block - Elastomeric
   1. Primer, 1 Coat 018 Acrylic Block Filler
   2. Finish, 2 Coats 500 Solotex

Q. Cement Plaster - Flat - Acrylic
   1. Primer, 1 Coat 4600 Uniprime II
   2. Finish, 2 Coats 2000 Duratone

R. Cement Plaster - Low Sheen - Acrylic
   1. Primer, 1 Coat 4600 Uniprime II

2. Finish, 2 Coats 8300 Carefree Eggshell

S. Cement Plaster - Elastomeric
1. Primer, 1 Coat 4600 Uniprime II
2. Finish, 2 Coats 500 Solotex

T. Fiber Cement Siding – Low Sheen - Acrylic
1. Primer, 1 Coat 4600 Uniprime II
2. Finish, 2 Coats 8300 Carefree Eggshell

U. Ferrous - Flat – Acrylic over alkyd emulsion primer
1. Primer, 1 Coat 9600 Protec Metal Primer
2. Tie Coat, 1 Coat 9600 Protec Metal Primer
3. Finish, 1 Coat 2000 Duratone

V. Ferrous - Semi Gloss – Acrylic over alkyd emulsion primer
1. Primer, 1 Coat 9600 Protec Metal Primer
2. Tie Coat, 1 Coats 9600 Protec Metal Primer
3. Finish, 1 Coat 8400 Carefree Semi-Gloss

W. Ferrous - Gloss – VOC Compliant
1. Primer, 1 Coat 9600 Protec Metal Primer
2. Finish, 2 Coats 9900 Protec Gloss

X. Ferrous - Factory Primed. If shop primer is compatible with finish materials, clean and touch-up prime coat in lieu of full primer coat then apply paint finish as specified.

Y. Galvanized Steel and Aluminum - Flat - Acrylic
1. Surface Prep Monochem 9400 Metal Etch
2. Primer, 1 Coat 4800 Metal Pro Primer
3. Finish, 2 Coats 2000 Duratone

Z. Galvanized Steel and Aluminum - Gloss – VOC Compliant
1. Surface Prep Monochem 9400 Metal Etch
2. Primer, 1 Coat 4800 Metal Pro Primer
3. Finish, 2 Coats 9900 Protec Gloss

AA. Galvanized Steel and Aluminum – Semi-Gloss - Acrylic
1. Surface Prep Monochem 9400 Metal Etch
2. Primer, 1 Coat 4800 Metal Pro Primer
3. Finish, 2 Coats 8400 Carefree Semi-Gloss

BB. Perforated Acoustical Tile – Eggshell – Acrylic
1. Primer, 1 Coat: 1100 Hi Build PVA Sealer
2. Tie Coat, 1 Coat: 8300 Carefree Eggshell
3. Finish, 2 Coats: 8300 Carefree Eggshell

CC. Glass - semi-gloss
1. Primer, 1 Coat Zinsser Bulls Eye 123
2. Finish, 2 Coats 8400 Carefree Semi-Gloss

3.09 FINISH SYSTEM SCHEDULE - INTERIOR SURFACES (VISTA PAINT)

A. Wood – Opaque - Flat - Acrylic
   1. Primer, 1 Coat 4200 Terminator II
   2. Finish, 2 Coats 8100 Carefree Flat

B. Wood - Opaque - Semi Gloss - Acrylic
   1. Primer, 1 Coat 4200 Terminator II
   2. Finish, 2 Coats 8400 Carefree Semi-Gloss

C. Wood - Opaque - Eggshell - Acrylic
   1. Primer, 1 Coat 4200 Terminator II
   2. Finish, 2 Coats 8300 Carefree Eggshell

D. Wood - Opaque - Gloss - Acrylic
   1. Primer, 1 Coat 4200 Terminator II
   2. Finish, 2 Coats 8500 Carefree Gloss

E. Wood – Transparent with Stain - Non-Yellowing - Flat Lacquer
   1. Stain, 1 Coat VWS Series Wiping Stain
   2. Sealer, 1 Coat NAS1420 Lacquer Sanding Sealer
   3. Lacquer, 2 Coats NAF1421 Lacquer Flat

F. Wood - Transparent with Stain - Non-Yellowing - Semi Gloss Lacquer
   1. Stain, 1 Coat VWS Series Wiping Stain
   2. Sealer, 1 Coat NAS1420 Lacquer Sanding Sealer
   3. Lacquer, 2 Coats NAF1426 Lacquer Semi-Gloss

G. Wood - Transparent with Stain - Non-Yellowing - Gloss Lacquer
   1. 1 Coat, Stain VWS Series Wiping Stain
   2. 1 Coat, Sealer NAS 1420 Lacquer Sanding Sealer
   3. 2 Coats, Lacquer NAC1429 Lacquer Gloss

H. Wood - Stain - High Solids – Low Sheen – Lacquer
   1. Stain, 1 Coat VWS Series Wiping Stain
   2. Sealer, 1 Coat NAS1820 Lacquer Sanding Sealer
   3. Lacquer, 2 Coats NAS1822 Lacquer Satin

I. Wood - Stain - High Solids - Semi Gloss - Lacquer
   1. Stain, 1 Coat VWS Series Wiping Stain
   2. Sealer, 1 Coat NAS1820 Lacquer Sanding Sealer
   3. Lacquer, 2 Coats NAF1826 Lacquer Semi-Gloss

J. Wood - Stain High Solid - Gloss - Lacquer
   1. Stain, 1 Coat VWS Series Wiping Stain
   2. Sealer, 1 Coat NAS1820 Lacquer Sanding Sealer
   3. Lacquer, 2 Coats NAS1829 Lacquer Gloss

K. Concrete, Plaster, Masonry - Flat - Acrylic
   1. Primer, 1 Coat 4600 Uniprime II
   2. Finish, 1 Coat 8100 Carefree Flat

L. Concrete, Plaster, Masonry - Flat – Acrylic – Zero or Low VOC
   1. Primer, 1 Coat 7001 Acriglo Primer
   2. Finish, 2 Coats 7100 Acriglo Flat

M. Concrete, Plaster, Masonry - Eggshell - Acrylic
   1. Primer, 1 Coat 4600 Uniprime II
   2. Finish, 2 Coats 8300 Carefree Eggshell

N. Concrete, Plaster, Masonry - Eggshell – Acrylic – Zero or Low VOC
   1. Primer, 1 Coat 7001 Acriglo Primer
   2. 2 Coat, Finish 7500 Acriglo Eggshell

O. Concrete, Plaster, Masonry – Semi-Gloss - Acrylic
   1. Primer, 1 Coat 4600 Uniprime II
   2. Finish, 2 Coats 8400 Carefree Semi-Gloss

P. Concrete, Plaster, Masonry – Semi-Gloss - Acrylic – Zero or Low VOC
   1. Primer, 1 Coat 7001 Acriglo Primer
   2. Finish, 2 Coats 7000 Acriglo Semi-Gloss

Q. Gypsum Board - Flat – Acrylic (Skim Coat required for Level 5 finish)
   1. Primer, 1 Coat 1100 Hi-Build PVA Sealer
   2. Finish, 2 Coats 8100 Carefree Flat

R. Gypsum Board - Flat – Acrylic – Zero VOC (Skim Coat required for Level 5 finish)
   1. Primer, 1 Coat 7001 Acriglo Primer
   2. 2 Coats. Finish 7100 Acriglo Flat

S. Gypsum Board - Eggshell – Acrylic (Skim Coat required for Level 5 finish)
   1. Primer, 1 Coat 1100 Hi-Build PVA Sealer
   2. Finish, 2 Coats 8300 Carefree Eggshell

T. Gypsum Board - Eggshell – Acrylic – Zero VOC (Skim Coat required for Level 5 finish)
   1. Primer, 1 Coat 7001 Acriglo Primer
   2. 2 Coat, Finish 7500 Acriglo Eggshell

U. Gypsum Board - Semi Gloss – Acrylic (Skim Coat required for Level 5 finish)
   1. Primer, 1 Coat 1100 Hi-Build PVA Sealer
   2. Finish, 2 Coats 8400 Carefree Semi-Gloss

V. Gypsum Board – Semi Gloss – Acrylic – Zero VOC (Skim Coat required for Level 5 finish)
   1. Primer, 1 Coat 7001 Acriglo Primer
   2. Finish, 2 Coats 7000 Acriglo Semi-Gloss

W. Gypsum Board - Gloss – Acrylic (Skim Coat required for Level 5 finish)
   1. Primer, 1 Coat 1100 Hi-Build PVA Sealer
   2. Finish, 2 Coats 8500 Carefree Gloss

X. Ferrous - Flat – Acrylic over Alkyd Emulsion Primer
   1. Primer, 1 Coat 9600 Protec Metal Primer

2. Tie Coat, 1 Coat 9600 Protec Metal Primer
3. Finish, 1 Coat 8100 Carefree Flat

Y. Ferrous - Semi Gloss – Acrylic over Alkyd Emulsion Primer
1. Primer, 1 Coat 9600 Protec Metal Primer
2. Tie Coat, 1 Coat 9600 Protec Metal Primer
3. Finish, 1 Coat 8400 Carefree Semi-Gloss

Z. Ferrous - Gloss – Acrylic over Alkyd Emulsion Primer
1. Primer, 1 Coat 9600 Protec Metal Primer
2. Tie Coat, 1 Coat/ 9600 Protec Metal Primer
3. Finish, 1 Coat 8500 Carefree Gloss

AA. Ferrous - Factory Primed. If shop primer is compatible with scheduled finish, clean and touch-up prime coat then apply Finish as specified.

BB. Galvanized and Aluminum - Flat - Acrylic
1. Surface Prep Monochem 9400 Metal Etch
2. Primer, 1 Coat 4800 Metal Pro Primer
3. Finish, 2 Coats 8100 Carefree Flat

CC. Galvanized and Aluminum - Semi Gloss - Acrylic
1. Surface Prep Monochem 9400 Metal Etch
2. Primer, 2 Coats 4800 Metal Pro Primer
3. Finish, 2 Coats 8400 Carefree Semi-Gloss

DD. Galvanized and Aluminum - Gloss - Acrylic
1. Surface Prep Monochem 9400 Metal Etch
2. Primer, 1 Coat 4800 Metal Pro Primer
3. Finish, 2 Coats 8500 Carefree Gloss

EE. Perforated Acoustical Tile – Eggshell – Acrylic
1. Primer, 1 Coat: 1100 Hi-Build PVA Sealer
2. Finish, 2 Coats: 8300 Carefree Eggshell

FF. Glass - semi-gloss
1. Primer, 1 Coat Zinsser Bulls Eye 123
2. Finish, 2 Coats 8400 Carefree Semi-Gloss

3.10 SPECIAL COATING SYSTEMS

A. Exterior Concrete, Masonry, Wood Floors - Low Sheen (acrylic epoxy)
1. Finish, 2 Coats
a. Vista, 400 Acripoxy [with anti-slip aggregate]

B. Interior Concrete Floors - Low Sheen, Acrylic-Epoxy
1. Finish, 2 Coats
a. Vista, 400 Acripoxy

C. Interior Concrete Floors - Gloss, Acrylic-Epoxy
1. Finish, 2 Coats

a. Vista, Sierra Performance S40

D. Reflective Paint - Acrylic
1. Acceptable Manufacturers
   a. DayGlo Color Corp., Cudahy, CA and Cleveland, OH
   b. Emedco, Buffalo, NY
   c. Or equal.
2. Acceptable Products
   a. Blue: DayGlo Nightglo, NGX
   b. Orange: DayGlo Nightglo, NG25
   c. Yellow Green: DayGlo Nightglo, NG15

E. Magnetic Primer
1. Rust-Oleum Specialty Magnetic Latex Primer

F. Plaster, Drywall, Wood, Concrete - Vapor Barrier Primer/Sealer (if used, substitute for scheduled primer, then apply Finish specified.)
1. Vista Paint/Zinsser B-I-N Shellac Base Vapor Barrier

G. Plaster, Concrete, Masonry [Gypsum Board] –Gloss – Water-Based Epoxy
1. Primer, 1 Coat PPG Perma-Crete Primer
2. Distributed by Vista Paint
3. Finish, 2 Coats PPG Pitt-Glaze WB Gloss
4. Distributed by Vista Paint

H. Plaster, Concrete, masonry – Semi-Gloss – Epoxy
1. Primer, 1 Coat Amerlock 2 Epoxy
2. 4-6 mils dft.
3. Finish, 1 Coats Amerlock 2 Epoxy
4. 4-6 mils dft.
5. Distributed by Vista Paint

I. Gypsum Board – Semi Gloss – Water-Based Epoxy
1. Primer, 1 Coat PPG Speedhide 6-2 Primer
2. Distributed by Vista Paint
3. Finish, 2 Coats PPG Pitt-Glaze WB Semi-Gloss
4. Distributed by Vista Paint

J. Steel, Galvanized Metal, Concrete,– Semi-Gloss Epoxy Mastic Low VOC
1. Primer, 1 Coat Amerlock 2 Epoxy
2. 4-6 Mils dft.
3. Finish, 1 Coat Amerlock 2 Epoxy
4. 4-6 Mils dft.

K. Signs, numbers, graphics, and lettering: Obtain the services of a professional sign painter for the application of painted signs, numbers, and graphics. Unless otherwise indicated, characters shall be 4" high, 3/4" wide stroke, black.

L. Special Coatings: Exterior; metal handrails, railings, guardrails, roof sheet metal flashings, pipe bollards, road gates, ladders, ornamental metal fences and gates, galvanized structural steel, Structural Steel Architecturally Exposed Structural Steel (AESS), roof screens, trash and equipment enclosures exterior metal stairs, roof hatches scheduled items in Section 05 50 00, Metal Fabrications. Total 5.0 to 8.5 mil thickness, as recommended by the manufacturer:
   1. Unprimed or shop primed - Ferrous - Gloss – Polyurethane
      a. Primer, 1 Coat Amerlock 2 Epoxy
      b. 4-6 Mils dft.
      c. Finish, 2 Coats Amershield VOC Polyurethane Gloss
      d. Mils dft.
      e. Distributed by Vista Paint
   2. Galvanized or Aluminum - Gloss - Polyurethane
      a. Primer, 1 Coat Amerlock 2 Epoxy
      b. Finish, 2 Coats Amershield VOC Polyurethane Gloss
      c. Distributed by Vista Paint
   3. Galvanized - Gloss – Polyurethane –salt air, moisture environment
      a. Primer, 1 Coat, Amerlock 2 Epoxy
      b. 4-6 m
      c. Finish, 2 Coats, Amershield VOC Polyurethane Gloss
      d. Distributed by Vista Paint

M. Unprimed Metal, Surface Preparation: SSPC-SP 3, Power Tool Cleaning

N. Galvanized Metal, Surface Preparation: SSPC-SP1, Solvent Wash, and etch with one of the following.
   1. Monochem 9400 Metal Etch

O. Aluminum Surface Preparation: SSPC-SP1, Solvent Wash, then apply Vista 9600 Protec Metal Primer

P. Architecturally Exposed Structural Steel (AESS), Surface Preparation: SSPC-SP 6 Commercial Blast Cleaning

END OF SECTION

SECTION 10 14 00

IDENTIFICATION SIGNS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Plastic Signs, raised character, tactile, room identification, exit door signs, and non-tactile signs.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)
   1. ASTM D4802 - Poly (Methyl Methacrylate) Acrylic Plastic Sheet

B. ADA – Americans with Disabilities Act of 1990 as amended.
   1. ADA/Standards – ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.

C. CBC - 2013 California Building Code (CBC)
   1. CBC 10 - Chapter 10, Egress Requirements
   2. CBC 11B– Chapter 11B , Accessibility for Public Buildings, Public Accommodations, Commercial Facilities and Publicly Funded Housing

D. CFC – 2013 California Fire Code.

E. California Code of Regulations (CCR)
   1. CCR 19-3 - Title 19, Chapter 3

F. Fed.Stnd - Federal Standard
   1. Fed.Stnd 595C, Colors Used in Federal Procurement

1.03 SUBMITTALS

A. Shop Drawings of each sign, indicating lettering styles and locations and overall dimensions.

B. Three sample, full size, signs, of types, styles and colors specified including method of mounting. If accepted, samples may be installed in Project.

C. Manufacturer's Installation Instructions

D. Lettering Samples: 1-inch high, uppercase I, and O letters in each font specified, for required Quality Assurance testing.

1.04 QUALITY ASSURANCE

A. Pre-Installation Conference

1. Notify Architect when signs are ready for installation. Arrange for conference at site. Do not proceed with installation until Architect's approval of specific locations and methods of attachment has been obtained.
2. Provide signs from one manufacturer, unless otherwise approved.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site and protect from damage. Store until immediately prior to Notice of Completion.

PART 2 - PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Tactile Character Type: Tactile characters on signs shall be raised 1/32 inch minimum, and shall be sans serif uppercase characters accompanied by Contracted (Grade 2) Braille. Italic, oblique script, highly decorative or unusual style forms not permitted. CBC Section 11B-703.1.

B. Character Proportions: Raised characters on signs shall be selected from fonts where the width of the uppercase letter “O” is 60% minimum and 110% maximum of the height of the uppercase letter “I”.

C. Tactile Character Height: Raised characters shall be a minimum of 5/8 inch and a maximum of 2 inches high. CBC Section 11B-703.2.5.

D. Stroke thickness of the uppercase letter “I” shall be 15% maximum of the height of the character. CBC Section 11B-703.2.6

E. Character spacing measured between the two closest points of adjacent raised characters within a message. Where characters have rectangular cross sections, spacing shall be 1/8” minimum and 4 times the stroke width, maximum. Where characters have other cross sections, spacing between individual raised characters shall be 1/16” minimum and 4 times the stroke width maximum at the base of the cross sections, and 1/8” minimum and 4 times the stroke width maximum at the top of the cross sections. Characters hall be separated from raised borders and decorative elements 3/8” minimum.

F. Line Spacing: Spacing between the baselines of separate lines of raised characters within a message shall be 135% minimum and 170% maximum of the raised character height.

G. Finish and Contrast: Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either light characters on dark background or dark characters on light background.

H. Braille: California (Contracted) Grade 2 Braille. Dot base diameter shall be 0.059 inch to 0.063 inch. Dots shall be 0.100 inch on center in each cell with 0.300 inch space between corresponding dots in adjacent cells. Distance between corresponding dots from one cell directly below, 0.395 to 0.400 inch. Dots shall be raised 0.025 to 0.037 inch above the background. Braille dots shall be domed or rounded.

I. Mounting Height and Location: Signs with raised characters and Braille shall be located 48” minimum to the baseline of the lowest line of Braille cells and 60” maximum to the baseline of the highest line of raised characters above the finish floor or ground surfaces. Mounting location shall be located so that a clear space of 18” minimum by minimum by 18” minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position. CBC Section 11B-703.4.

2.02 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
1. Mohawk Sign Systems, Inc., Schenectady, NY.
2. Roemer Industries, Masury, OH.
3. ASI Modulex, Inc., Dallas, TX.
4. Vomar Products.
5. Apco Signs, Atlanta, GA.
6. Nelson-Harkins Industries, Inc.
7. Mathews International Corporation
8. Vista System

B. Or approved equal in accordance with Division 01 General Requirements for substitutions.

2.03 PLASTIC SIGN MATERIALS

A. Tactile Plastic Sign Materials: Thermosetting high pressure laminate.

B. Non-Tactile Signs: Acrylic Plastic Sheet: ASTM D4802, Category A-1, 1/4 inch overall thickness, laminated acrylic plastic sheets.

2.04 SIGN FABRICATION - GENERAL

A. Plastic Signs
1. Tactile and Braille Copy: Sand-Carved signs; thermosetting high pressure laminate using Graphic Process Sand-Carved signs, with square corners, and square cut edges Graphics, Braille and tactile copy required.
a. Unframed Signs: Mohawk 1000 ADA System signs, Series 200A, Design M-311 or Design M310A/B window plaques where indicated, by Mohawk Sign Systems or equal. Custom copy by Architect.
2. Apply UV inhibitor overcoat for exterior signs.

B. Fasteners: Stainless steel screws, flat head, pin-in-head torx screws for vandal-proof and clear silicone adhesive.

C. Lettering Type Style: Helvetica Regular, uppercase letters only, refer to QUALITY ASSURANCE for letter-proportion compliance.

D. Colors: Per Section 09 06 00 Schedules for Finishes

2.05 ROOM IDENTIFICATION SIGNS

A. Room Identification Signs: raised character, tactile plastic signs in colors as scheduled in Section 09 06 00.
   1. ADA Tactile and Braille Signs: Thermosetting high pressure-laminate using Graphic Process Sand-Carved signs.
   2. Non-Tactile Signs: Acrylic Plastic Sheet: ASTM D4802, Category A-1.

B. Size: 2-1/2 inches high, minimum, by 8 inches long, with 7/8 inch high, letters minimum 1/32 inch thick, minimum 3/32 inch thick for metal signs, fully tactile, with BRAILLE indicator.
   1. Provide one sign with up to 13 letters for each door.
   2. Provide one sign with up to 3 numerals for each door.

2.06 MISCELLENEOUS SIGNS

A. Fire Extinguisher: 2-way Plastic 12 by 4 inches, White/Red. Portable fire extinguishers per CFC 906 and Title 19. Refer to Section 10 44 13.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive Work.

B. Beginning of installation means installer accepts existing surfaces.

3.02 INSTALLATION

A. Install signs only after surfaces are finished, install at all rooms.
   1. At single-leaf doors, locate signs on wall adjacent to latch side of applicable door opening, centered horizontally within 18-inch space adjacent to latch side of door, 60 inches from finish floor to center line of sign. Mounting location shall be located so that a clear space of 18” minimum by minimum by 18” minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position. CBC Section 11B-703.4.2.

B. Mounting
   1. Tactile Plastic Signs: Stainless steel screws, pin torx, vandal-proof.

C. For signs installed on glass: a blank glass back up is required to be placed on opposite side of glass exactly behind sign being installed. This blank glass back up is to be the same size as sign being installed.

D. Clean and polish signs following manufacturer’s instructions.

3.03 SIGN TYPES AND SCHEDULE

A. As indicated on Drawings.

END OF SECTION

SECTION 10 14 33

EXIT SIGNAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Self-Luminous Exit Signage.

1.02 REFERENCES

A. ADA – Americans with Disabilities Act of 1990
   1. ADA Standards – ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.

B. CBC - California Building Code, 2013.

C. UL 924 – Emergency Lighting and Power Equipment.

1.03 SUBMITTALS

A. Shop drawings listing sign styles, lettering and locations and overall dimensions of each sign.

B. Two samples illustrating full size sample sign, of type, style and color specified including method of attachment. If accepted, samples may be installed in project.

C. Manufacturer's installation instructions.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements for Tactile Exit Signs
   1. Conform to CBC for accessibility provisions, CBC 1011.4, 11B-703.1, 11B-703.2, 11B-703.3, 11B-703.4 and 11B-703.5.
   2. Signage Requirements
      a. Character Proportions: Characters shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase "I", 11B-703.2.4. Stroke thickness of the uppercase letter “I” shall be 15% maximum of the height of the character. All letters measured must be uppercase.
      b. Line Spacing: Spacing between the baselines of separate lines of raised characters within a message shall be 135% minimum and 170% maximum of the raised character height.
      c. Finish and contrast: Characters and their background shall have a non-glare finish. Characters shall contrast with their background, with either light characters on a dark background or dark characters on a light background, 11B-703.5.1.

d. Characters and symbols shall contrast in color or image with either light letters on dark background or dark letters on light background, and shall be raised minimum 1/32 inch.
e. Minimum height for raised characters or symbols: 5/8 inch minimum and 2 inches maximum, uppercase.
f. Braille: California (Contracted) Grade 2 Braille. Dot base diameter shall be 0.059 inch (1.5 mm) to 0.063 inch (1.6 mm). Dots shall be 0.100 inch (2.5 mm) on center in each cell with 0.300 inch (7.6 mm) space between corresponding dots in adjacent cells. Distance between corresponding dots from one cell directly below, 0.395 to 0.400 inch. Dots shall be raised 0.025 to 0.037 inch above the background. Braille dots shall be domed or rounded.

B. Pre-installation Conference: Notify Architect when signs are ready for installation. Arrange for conference at site. Do not proceed with installation until Architect's approval of specific locations and methods of attachment has been obtained.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site and protect from damage. Store until immediately prior to Notice of Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
1. Evenlite, Bensalem, PA.
2. Active Safety, Murray, UT
3. Safe Glow Corp, Yorba Linda, CA
4. Self-Powered Lighting Inc., Berwyn, PA
5. Isolite Corporation, San Luis Obispo, CA

B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.02 REGULATORY REQUIREMENTS

A. Exit Sign shall be illuminated at all times.

B. Self-Luminous Signs: CBC Section 1011.5.

2.03 EMERGENCY EXIT SIGNS

A. Self-Luminous Exit Signs: UL 924 Listed, minimum luminance, 0.06 foot lambert. Non electric, internally illuminated by sealed tritium gas light source.
1. Surface Mounted Wall Signs:
a. Low and High Level Exit Signs - Wall: Evenlite Slimline SL Series, green illuminating letters, stenciled brush aluminum face plate with Self-luminous TEXT. Finish: brushed aluminum, 8-1/4• H x 12-3/4• L x 3/4• thick, single face, one type of sign at each exit door.

2.04 TACTILE EXIT SIGNS

A. Conform to Sections 1011.4, 11B.703.1, 11B.703.2, 11B.703.3, and 11B.703.5, CBC 2013 .
   1. Mfg: By Emedco, Buffalo, NY; All State Sign and Plague, Deer Park, NY. Or equal.

B. Install sign at each exit door as conditions required in CBC Section 1011.4 CBC:
   1. Each grade-level exterior exit door shall be identified by a tactile exit sign with the word, EXIT• .
   2. Each exit door that leads directly to a grade-level exterior exit by means of a stairway or ramp shall be identified by a tactile exit sign with the following words as appropriate:
      a. EXIT STAIR DOWN•
      b. EXIT RAMP DOWN•
      c. EXIT STAIR UP•
      d. EXIT RAMP UP•
   3. Each exit door that leads directly to a grade-level exterior exit by means of an exit enclosure that does not utilize a stair or ramp, or an exit passageway shall be identified by a tactile exit sign with the works, EXIT ROUTE• .
   4. Each exit access door from an interior room or area that is required to have a visual exit sign, shall be identified by a tactile exit sign with the words. EXIT ROUTE• .
   5. Each exit door through a horizontal exit shall be identified by a tactile exit sign with the words TO EXIT• .

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work.

B. Beginning of installation means installer accepts existing surfaces.

3.02 INSTALLATION

A. Install signs only after surfaces are finished at exit locations.

B. Installation:
   1. Concealed mounting: Install with manufacturer’s attachment.
   2. Exposed mounting: Install with minimum four (4) stainless steel countersunk flathead screws, tamper-proof.

C. Low and High level mountings as indicated on Drawings and comply with requirements of Section 1011.8 CBC.
   1. Low level signs: Install not less than 6 inches or more than 8 inches above finish floor to the bottom of sign. Install the closest edge of sign within 4 inches of door frame.

D. Clean and polish.

END OF SECTION

SECTION 10 21 23

CUBICLE CURTAINS AND TRACK ASSEMBLY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cubicle Curtains.

B. Track Assembly
   1. Overhead metal curtain track and carriers.
   2. Overhead metal IV trees and track support systems.

C. Related Section; Section 09 06 00, Schedules for Finishes.

1.02 REFERENCES

A. NFPA 101 - Life Safety Code.

B. NFPA 13 - Standards for the Installation of Sprinkler Systems.

C. NFPA 701 - Fire Testing for Flame-Resistant Textiles and Films.

D. Underwriters Laboratories, Inc. - Flammability Test 214.

1.03 PERFORMANCE REQUIREMENTS

A. Track: Can support vertical test load of 100 pounds per foot without visible deflection of track or damage to supports.

B. Size track to support moving loads, sufficiently rigid to resist visible deflection.

1.04 SUBMITTALS

A. Shop drawings indicating:
   1. Schedule of curtain sizes
   2. Reflected ceiling plan view of curtain track, hangers and suspension points, attachment details.

B. Product data for curtain fabric characteristics and flame spread classification.

C. Three samples illustrating fabric color.

D. Sample patch of curtain cloth with representative hem, stitch detail, heading with reinforcement and carrier attachment to curtain header.

E. Three sample lengths of curtain track including typical splice and all accessories.

F. Manufacturer's installation instructions.

G. Maintenance data including recommended cleaning methods and materials, and stain removal methods.

H. Seismic anchorage calculations for ceiling hung assemblies shall be designed for uniform load of 20 pounds per square foot in addition to other design loads.

1.05 REGULATORY REQUIREMENTS

A. Conform to NFPA 101, Chapter 31 for flame spread requirements for curtain fabric.

B. Conform to NFPA 701, Fire Testing for Flame-Resistant Textiles and Films and UL Flammability Test 214.

C. Labeling: Proper labeling to each cubicle curtain according to NFPA 101 Section 6-6.1, and Title 19 CCR Chapter 8, Section 1173, and Title 19 CCR Article 8 Section 1324 Job Labeling.

1.06 MOCK-UP

A. Provide mock-up of curtain, track and accessories.

B. When accepted, mock-up will demonstrate minimum standard for Work. Mock-up may remain as part of Work.

1.07 DELIVERY, STORAGE AND HANDLING

A. Accept curtain materials on site and inspect for damage.

B. Store curtain materials on site and deliver to Owner for installation when requested.

1.08 EXTRA MATERIALS

A. Submit maintenance materials.

B. Provide two of each curtain size specified.

PART 2 - PRODUCTS

2.01 CURTAIN MATERIALS

A. Manufacturer: Imperial Fastener System,, Pompano Beach, FL, or equal as approved in accordance with Division 01, General Requirements for substitutions.

B. Curtain: NFPA 701; Close weave 100 percent flame retardant , preshrunk, flameproofed to requirements of State Fire Marshal, minimum 12 oz per lineal yard.

C. Break-A-Way Curtain: Imperial Fastener System, IFC-69 Jiffy Curtain track and Curtain material specified in this section with slider tape sewn to top hem of curtain.

D. Mesh: Nylon, 1/2 inch hole, No. 50, 70 percent openings.

E. Refer to Section 09 06 00, Schedules for Finishes for styles and colors.

2.02 TRACK MATERIALS

A. Manufacturer
   1. Products of following manufacturers form basis for design and quality intended.
      a. Kirsch Co., Sturgis, MI.
      b. Clickeze InPro Corporation, Muskego, WI.
      c. Pryor Products, Solana Beach, CA.
      d. A.R. Nelson Inc., Long Island City, NY.
      e. Imperial Fastener Co., Pompano Beach, FL.
      f. General Cubicle Co., Telford, PA.
      g. Curtain Fair Custom.
   2. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

B. Track: Aluminum 6063-T5; extruded aluminum sections, one piece per cubicle track run, Kirsch Series 9600 for Cubicle Series 9600 for I.V.

C. Curtain Fair: Multi. Channel Track System Euro Style Slim Line track Low Profile with Master Carriers, hooks and accessories.
   1. Four Channel: PS 4 Track
   2. Three Channel: PS 3 Track
   3. Two Channel: PS 2 Track

D. Track Ends: Positive stop to fit track extrusion, Kirsch Series 9610 .

E. Pull Out: Located where curtains are stacked, Kirsch Series 9611.

F. Carriers: Nylon roller to accurately fit track, bead chain metal hook, Kirsch Series 9616, two per lineal feet of track .
   1. I.V. Carriers: Four nylon rollers to accurately fit track with stainless steel spiral hook, Kirsch Series 9660 twist lock type.

G. I. V. Trees
   1. Deluxe, Kirsch Series 9655, bright zinc finish, adjustable, with thumb-locking slide, 3/4 inch diameter outer tube, 3/8 inch diameter rod, multiple arm I.V. body, 5 bottle capacity with non-conductive connector between tree and carrier.
   2. Provide one tree per I.V. track run. Remainder of trees required to complete installation: [Owner-Furnished, Owner-Installed.]

H. Drop Hangers: 16 inches long chain, Kirsch Series 9690 . 6 inch connector: Kirsch Series 9691, one per carrier.

I. Finishing
   1. Exposed Aluminum Surfaces: Clear anodized finish, Kirsch 090.
   2. Exposed Stainless Steel Surfaces: Bright Zinc, Kirsch 061.

2.03 FABRICATION

A. Manufacture curtains sized 10 percent wider than track length. Terminate curtain 15 inches from floor + 1”.

B. Top Hems: 1-1/2 inch wide, triple thickness double lockstitch. Bottom Hems: 1-1/2 inch wide double thickness, double lockstitch. Side Hems: 1/2 inch wide, turned and single lockstitch. Seams: 1/2 inch wide, double turned and double lockstitch.

C. Grommets: Rustproof, stainless steel, 6 inches oc.

D. Thread: OD gauge mercerized cotton, color to match fabric, overlock stitch.

E. Mesh: Double lockstitch to top of curtain fabric with 1/2 inch wide, triple thickness top seam. Provide 1-1/4 inch tape, double lockstitch to top hem for grommets.

F. Fabricate track bend with minimum 14 inch radius without deforming track section or impeding movement of carriers.

G. Code mark curtains to Owner's requirements with sewn-in identification tape at heading.

H. Label on Cubical Curtains: Polyester Inherently Flame Retardant passes NFPA 701.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify surfaces and above ceiling supports are ready to receive work.

B. Verify field measurements.

C. Beginning of installation means installer accepts existing surfaces and conditions.

3.02 INSTALLATION

A. Install curtain track secure and rigid, true to ceiling line.

B. Install end cap and stop device.

C. Secure track to suspended ceiling system as indicated on drawings.

D. Install curtains on carriers ensuring smooth operation. Top of solid-fabric curtain shall not be less than 18 inches from horizontal plane of sprinkler head deflector. Curtains supported by fabric mesh on ceiling track having openings in the mesh equal 70 percent and extend a minimum of 22” from ceiling shall not be considered obstruction to sprinkler operation per NFPA 13 Section 8.6.5.2.2.1.

END OF SECTION

SECTION 21 13 13

FIRE PROTECTION

PART 1 - GENERAL

1.01 GENERAL AND SPECIAL CONDITIONS

A. General and special conditions apply to the work in this section.

B. The Contractor shall furnish all equipment, materials, tools, labor, engineering, drawings, etc. necessary for a complete fire protection system, with said systems being made ready for operation in accordance with the requirements of the Authorities Having Jurisdiction. The purpose of Owner furnished specifications is to convey to the Contractor the scope of work required, all of which the Contractor is responsible to furnish, install, adjust, and make operable. The omission by the Owner of any necessary system component as required by the Authorities Having Jurisdiction, in the specifications shall not relieve the Contractor of the responsibility for providing such necessity, without additional cost to the Owner. The Contractor shall visit the site before submitting his bid and shall examine all existing physical conditions that may be material to the performance of his work. No extra payments will be allowed to the Contractor as a result of extra work made necessary by his failure to do so. Any case of error, omission, discrepancy or lack of clarity shall be promptly identified to the Owner, Architect, and Engineer for clarification prior to the bid due date.

C. The Contractor shall provide all devices and equipment required by these specifications. Under no circumstances will the Contractor delete any equipment or devices without the written directive of the Owner.

1.02 SYSTEM ABBREVIATIONS AND DEFINITIONS

A. AHJ – Authority Having Jurisdiction (DSA).

B. Approved – Unless otherwise stated, materials, equipment or submittals approved by the Engineer.

C. ANSI – American National Standards Institute.

D. Architect – HMC Architects.

E. ASTM – American Society for Testing and Materials.

F. AWS – American Welding Society.

G. AWWA – American Water Works Association.

H. Concealed – Where used in connection with installation of piping or conduit and accessories, shall mean, “Hidden from sight” as in shafts, furred spaces, in soffits or above suspended ceilings.

I. Contractor – The Company awarded the prime contract for this work and any of its subcontractors, vendors, suppliers, or fabricators.

J. Engineer – JENSEN HUGHES.

K. Exposed – Where used in connection with installation of piping or conduit and accessories, shall mean “visible” or “not concealed.”

L. FM – FM Global.

M. FM Approved – Materials or equipment approved by FM Global and included in the most recent edition of the FM Approval Guide.

N. Furnish – Supply materials.

O. GPM – Gallons per minute.

P. Install – Install materials, mount, and connect equipment or assemblies.

Q. IRI – Industrial Risk Insurers.

R. ISO – Insurance Services Office.

S. NFPA – National Fire Protection Association.

T. Owner – Palomar Community College.

U. PIV – Post indicating valve.

V. Provide – Furnish, install, and connect.

W. PSI – Pounds per square inch.

X. QR – Quick-Response Sprinkler.

Y. Remove – Remove material and equipment and restore surface.

Z. UL – Underwriters Laboratories, Inc.

AA. UL Listed – Materials or equipment by Underwriters Laboratories and included in the most recent edition of the UL Fire Protection Equipment Directory.

1.03 SCOPE OF WORK

A. Revise the existing sprinkler locations based on the revised floor and ceiling plans as outlined in the project specifications and shown on the permit drawings, including all labor, materials, permits, shop drawings, and hydraulic calculations needed to furnish and install a complete and functional automatic sprinkler system, and all of the following:

1. Wet pipe automatic sprinkler system throughout the tenant improvement remodel area.

2. Demolish and remove existing pendent sprinklers in remodel area.

3. Install new 1-inch armovers. Revise sprinkler locations based on revised floor and ceiling plans. Coordinate piping around mechanical.

   a. Provide at least one new hanger on each new piece of pipe.
   b. Where existing sprinklers are to be removed and no new sprinklers are to be supplied from that pipe, demolish all piping back to the branch line and provide a cap at the outlet on the branch line.

4. All existing seismic sway bracing is to remain as is.

5. The entire building not under construction shall have a fully operational and code compliant sprinkler system.

6. All demolition and construction work outside of the indicated primary areas of remodel, and all demolition and construction work above, below, or inside of any

occupied portions of the building shall be done as evening or weekend work. Exact allowable hours as defined by the Owner.

7. Fire watch, paid for by the Contractor, for any area under construction, and for any down time in phases not under construction.
8. Coordinate all work with other trades.
9. Coordination and interface of alarm initiating and supervisory devices with the fire alarm system.
10. Shop drawings.
11. As-built drawings. The Contractor will be required to provide as-built drawings on disk/CD in AutoCAD format, in addition to required reproducible and blueline drawings.
12. On-site project supervision.
13. Cabinet containing the required number and type of spare sprinklers and corresponding wrenches, to be located in the riser room.
14. All required system testing in accordance with NFPA 13, and 25.
15. Warranty on all materials and labor.
16. All permits, taxes, and fees, including AHJ inspection and testing fees necessary to complete the specified work.

1.04 RELATED WORK

A. Materials and methods specified in other sections, included but not limited to:

1. Cutting and patching.

1.05 DESIGN CRITERIA

A. Sprinkler System

1. Wet system, with K-Factor of 5.6 recessed pendent sprinklers spaced to a maximum of 225 square feet per sprinkler. The system shall be designed to provide 0.10 gpm per square foot for the most remote 1,500 square foot area with a hose demand of 100 gpm (Light Hazard).

1.06 APPLICABLE STANDARDS

A. American National Standards Institute, Inc. (ANSI) Standards, current editions:

1. A21.10a – Gray-Iron and Ductile-Iron Fittings, 2 inch through 48 inch for Water and Other Liquids.
2. A21.11 – Rubber-Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings.
3. B16.1 – Cast-Iron Pipe Flanges and Flanged Fittings, 24, 125, 250, and 800 pounds.
4. B16.3 – Malleable-Iron Threaded Fitting, Class 150 and 300.
5. B16.4 – Cast-Iron Threaded Fitting, Class 125 and 250.

6. B18.2.1 – Square and Hex Bolts and Screws.
7. B18.2.2 – Square and Hex Nuts.
8. B36.10 – Welded and Seamless Wrought Steel Pipe.
9. B112.1 – Hose Valves for Fire Protection Services.

B. American Society for Testing and Materials (ASTM) Standards, current edition:

1. A 53 – Specifications for Welded and Seamless Steel Pipe.
2. A 307 – Carbon Steel Externally and Internally Threaded Standard Fasteners.

C. American Standard Mechanical Engineers (ASME) Standards, current edition:

1. B1.20.1 – Pipe Threads, General Purpose.

D. American Welding Society (AWS) Standards, current edition:

1. D10.9 – Qualification of Welding Procedures and Welders for Piping and Tubing, Level AR-3.
2. B2.1 – Specifications for Qualification of Welding Procedures and Welder for Piping and Tubing.

E. California Building Code (CBC), 2013

F. California Electrical Code (CEC), 2013

G. California Fire Code (CFC), 2013

H. National Fire Protection Association 13 (NFPA 13) – *"Standard for the Installation of Sprinkler Systems,"* 2013 Edition.

I. National Fire Protection Association 24 (NFPA 24) – *"Standard for the Installation of Private Fire Service Mains,"* 2013 Edition.

J. National Fire Protection Association 25 (NFPA 25) – "Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems," 2014 Edition.

K. Underwriters Laboratories, Inc. (UL) Publication:

1. Fire Protection Equipment List (Annually with Quarterly Supplements).

1.07 APPROVALS

A. Obtain approval of shop drawings from Engineer and all applicable local, state, and federal authorities prior to fabrication and installation of materials.

1.08 SUBMITTALS

A. Shop Drawings

1. Submit three sets of complete shop drawings and three sets of manufacturer's data to Architect and Engineer for all necessary reviews prior to fabrication of materials.
2. Contractor shall submit complete system packages. Partial system submittals will be rejected.

3. Prepare shop drawings with a minimum scale of ¼ inch = 1 foot-0 inch for plans, and ¼ inch = 1 foot-0 inch for details. Show all piping, sprinklers, hangers, type of pipe, tube connections, outlets, and occupancy of each area, including ceiling and roof heights as required by NFPA 13. When welding is planned, shop drawings shall indicate the sections to be shop welded and the type of welded fittings to be used. All drawings shall be prepared using AutoCAD.
4. Design shall be based on these specifications and the appropriate NFPA standards.

B. Changes

1. Make no changes in installation from layout as shown on the drawings unless change is specifically approved by the Engineer and AHJ. This does not include minor revisions for the purpose of coordination.
2. Any pipe fabricated and/or installed before all approvals are obtained at the Contractor's own expense and responsibility. Any changes made to the approved drawings other than as stated above are at the Contractor's own expense and responsibility.

C. Manufacturer's Data

1. Provide data from manufacturer on the following devices, including installation, maintenance, and testing procedures, dimensions, wiring diagrams, etc. Where any devices that are provided or furnished involve work by someone other than the Contractor, submit additional data copies directly to the Contractor. At a minimum, the following data sheets shall be provided:
    a. Sprinklers and escutcheons.
    b. Pipe, fittings, and hangers.

D. As-Built Drawings

1. Maintain at the site an up-to-date marked set of as-built drawings, which shall be corrected and delivered to the Owner upon completion of work.
2. Upon completion, furnish the Owner with 3 sets of reproducible sepia prints, and one set in electronic AutoCAD "DWG" format of each reviewed shop drawing, revised to show "as-built" conditions.

E. Samples

1. Provide one sample of each type of sprinkler and escutcheon.

F. Final Inspection and Test

1. The Contractor shall make arrangements with the Owner, Architect, and Engineer for final inspection and witnessing of the final acceptance tests. The Owner, Architect, and the Engineer will witness the final inspection.
2. Perform all tests and inspections required by the referenced codes and standards, the AHJ, and the Owner.
3. When the Engineer visits the job site for final inspection and tests after being advised by the Contractor that the work is complete and ready for test, if the work has not been completed or the final acceptance tests are unsatisfactory, the Contractor shall be responsible for the Engineer's extra time and expenses for

reinspection and witnessing the retesting of the work. Such extra fees shall be deducted from payments by the Owner to the Contractor.

4. Upon completion of final inspections and tests, as required by appropriate NFPA Standards, submit copies of Standard Contractor's Material and Test Certificate.

G. Operating Instructions

1. Furnish one copy of NFPA 25 and bound set of printed operating and maintenance instructions to the Owner, and adequately instruct the Owner's maintenance personnel in proper operation and test procedures of all fire protection components provided, furnished, or installed.

1.09 SPARE PARTS

A. Provide and install one spare sprinkler cabinet with no fewer than six spare sprinklers, complete with two sprinklers of each type and temperature rating used throughout the installation. The cabinet shall be equipped with sprinklers and special sprinkler wrenches required for each type of sprinkler installed.

B. Confer with the Owner's representative for exact location of cabinet.

1.10 GUARANTEE

A. The Contractor shall guarantee all materials and workmanship for a period of one year beginning with the date of final acceptance by the Owner. The Contractor shall be responsible during the design, installation, testing and guarantee periods for any damage caused by his (or his subcontractors') work, materials, or equipment.

1.11 PRODUCT DELIVERY

A. Delivery of Materials

1. Delivery of all materials and equipment to the job site shall be scheduled to assure compliance with the predetermined construction schedules.

B. Storage of Materials, Equipment, and Fixtures

1. Contractor shall be responsible for storage of materials on job site, including furnishing of any storage facilities or structures required.

C. Handling Materials and Equipment:

1. Contractor shall be responsible for on-site handling of materials and equipment.

1.12 QUALITY ASSURANCE

A. Testing Agency

1. All materials shall be UL listed or FM approved for their intended use.

B. Regulatory Agencies

1. State and local building codes and ordinances, and fire department requirements shall apply.

C. The Contractor shall be fully experienced and licensed in all aspects of the fire protections systems herein specified.

D. Similar materials shall be from a single manufacturer.

1.13 JOB CONDITIONS

A. Damage

1. Protect all unfinished work to prevent damage and furnish protection of all surrounding areas where necessary.

B. Leak Damage

1. The Contractor shall be responsible during the installation and testing periods of the sprinkler system for any damage to the work of others, to the building or its contents caused by leaks in any equipment, by unplugged or disconnected pipes or fittings, or by overflow, and shall pay for the necessary replacements or repairs to work of others damaged by such leakage.

1.14 EMERGENCY SERVICE

A. The Contractor shall provide emergency repair service for the sprinkler system within four hours of a request for such service by the Owner during the warranty period. This service shall be available on a 24-hour per day, seven-day per week basis.

1.15 PERMITS AND FEES

A. Pay for all permits, fees, and charges required for this work.

PART 2 - MATERIALS

2.01 GENERAL

A. All components shall be used in accordance with the manufacturer's recommendations and its UL listing and/or FM approval.

B. The naming of manufacturers in the specifications shall not be construed as eliminating the materials, products or services of other manufacturers and suppliers providing approved equivalent items.

C. The substitutions of materials or products other than those named in the specifications are subject to proper approval of the Owner granted in writing.

2.02 ABOVEGROUND PIPE

A. Armover Piping

1. Pipe shall be new, rated for 175-psi working pressure, conforming to ASTM specifications, and have the manufacturer's name and brand along with the applicable ASTM standard marked on each length of pipe.

a. Pipe used shall be black steel and must comply with the specifications of the ASTM A 53 for welded and seamless steel pipe.
b. Schedule 40 piping is required for sizes 2 inches and less. Pipe ends shall be threaded or roll grooved in accordance with NFPA 13.

2.03 FITTINGS AND JOINTS

A. Steel Pipe

1. Screwed fittings shall be cast iron, 175 pound class, black, and in accordance with ANSI B 16.4 or malleable iron, 175 pound class, black and in accordance with ANSI B 16.3. Bushings shall not be used.

2. Weld fittings shall be steel, standard weights, black, and in accordance with ASME B 16.9, ASME B 16.25, ASME B 16.5, ASME B 16.11 and ASTM A 234.

3. Grooved fittings and couplings shall be produced by the same manufacturer.

4. Grooved couplings shall be dimensionally compatible with pipe.

2.04 SPRINKLERS

A. Sprinklers shall be recessed pendent, quick-response type, nominal K-factor of 5.6, and ordinary temperature rating.

B. Sprinklers in finished areas shall have white paint finish.

C. Pendent sprinklers installed in areas where ceiling tiles are located shall be recessed and located at the center or quarter point of the tile.

2.05 SLEEVES FOR WALL/FLOOR PENETRATIONS

A. Sleeves through walls and floors shall be of a type that can be made watertight and fire stopped.

1. Sleeve sizes shall be as required by NFPA 13 for Earthquake Protection.

2.06 HANGERS

A. All hanger components shall be of an approved and listed type.

PART 3 - EXECUTION

3.01 GENERAL

A. Product Delivery

1. Delivery of Materials

a. Delivery of all materials and equipment to the job site shall be scheduled to assure compliance with the predetermined construction schedules.

2. Storage of Materials, Equipment, and Fixtures

a. Contractor shall be responsible for storage of materials on job site, including furnishing of any storage facilities or structures required.

3. Handling Materials and Equipment

a. Contractor shall be responsible for on-site handling of materials and equipment.

B. Clean-up

1. Maintain the premises free from accumulation of waste materials or rubbish caused by this work.

2. At the completion of the work, removed all surplus materials, tools, etc., and leave the premises clean.

C. Leak Protection

1. Damage

a. Protect all unfinished work to prevent damage and furnish protection of all surrounding areas where necessary.

2. Leak Damage

a. The Contractor shall be responsible during the installation and testing periods of the fire protection system for any damage to the work of others, to the building or its contents caused by leaks in any equipment, by unplugged or disconnected pipes or fittings, or by overflow, and shall pay for the necessary replacements or repairs to work of others damaged by such leakage.

D. Safety

1. All work shall be performed in compliance with the Occupational Safety and Health Act of 1970 and the Construction Safety Act Standards.

2. Contractor shall attend all job safety meetings.

3.02 FABRICATION

A. Pipe Ends

1. Ream and remove burrs after cutting pipe. Standard wall pipe ends shall be welded, threaded, cut grooved, or plain end.

2. Threads shall be in accordance with ASME B1.20.1.

B. Grooved Ends

1. Pipe minimum thickness, squareness, and out-of roundness shall be in accordance with the coupling manufacturer’s specifications.

2. Pipe surface shall be free of indentations, projections, and roll marks from the end of the pipe to the groove.

C. Welding

1. No field welding of sprinkler piping shall be permitted.

2. Armovers may be shop welded using acceptable welding fittings. Welding methods shall comply with all the requirements of AWS B2.1.

3. Certified records shall be maintained upon the completion of each weld, welder shall stamp an imprint of their identification into the side of the pipe adjacent to the weld.

3.03 INSTALLATION

A. General

1. A clean set of prints or shop drawings shall be maintained at the site and marked up to show any changes.

2. Piping shall be installed above ceilings except in areas where there is no ceiling. Install piping in exposed areas as high as possible using necessary fittings and auxiliary drains to maintain maximum clear head room.

3.04 HANGERS, SUPPORTS, AND EARTHQUAKE BRACING

A. General

1. All piping must be substantially supported from building structure and only approved types of hangers shall be used. Piping lines under ducts shall not be supported from ductwork, but shall be supported from building structure with trapeze hangers where necessary or from steel angles supporting ductwork in accordance with NFPA 13.

2. All thread rods shall not be bent.

3. Hanger components shall be ferrous.

3.05 SLEEVINGS, WALL, AND FLOOR PENETRATIONS

A. Set Schedule 40 sleeves in place for all pipes passing through openings in fire resistance rated construction when required by UL listing for fire stopping method utilized.

B. Provide clearance between the sprinkler piping and sleeves in accordance with NFPA and/or FM. The space between sleeve and pipe shall be filled with noncombustible, UL listed fire stopping materials. Provide chrome wall plates at each side of wall.

3.06 SYSTEM ACCEPTANCE

A. Tests

1. General system test shall be coordinated with the owner's representatives for training and witnessed by the AHJ. Problems noted during testing such as air or water leaks, difficulty in operating valves, alarm failures, etc. shall be corrected before the Contractor leaves the job.

2. Hydrostatically test all piping, including fire department connections between the check valve and connection, at 200 psi for 2 hours. If the highest static pressure at the lowest point in the system exceeds 150 psi, the system shall be tested at 50 psi more than the highest static pressure.

B. Contractor's material and test certificates shall be completed for each system/floor and signed by the Contractor and witnessed by the owner's representative/AHJ.

END OF SECTION

SECTION 26 01 00

ELECTRICAL GENERAL PROVISIONS

ARTICLE 1 SUMMARY

1.1 This Division of the specification outlines the provisions of the contract work to be performed under this Division.

1.2 This Section applies to and forms a part of each section of specifications in Division 26 and all work performed under the electrical and communications contracts.

1.3 In addition, work in this Division is governed by the provisions of the bidding requirements, contract forms, general conditions and all sections under general requirements.

1.4 These specifications contain statements which may be more definitive or more restrictive than those contained in the General Conditions. Where these statements occur, they shall take precedence over the General Conditions.

1.5 Where the words 'provide' or 'provision' are used, it shall be definitely interpreted as 'furnishing and installing complete in operating condition'. Where the words 'as indicated' or 'as shown' are used, it shall mean as shown on contract drawings.

1.6 Where items are specified in the singular, this Division shall provide the quantity as shown on drawings plus any spares or extras mentioned on drawings or specifications. All specified and supplied equipment shall be new.

ARTICLE 2 CONTRACTOR QUALIFICATIONS

2.1 The Contractor shall have a current California C-10 Electrical Contractor's license and all individuals working on this project shall have passed the Department of Industrial Relations Division of apprenticeship Standards – "Electrician Certification Program."

ARTICLE 3 CODES, PERMITS AND FEES

3.1 Comply with all applicable laws, ordinances, rules, regulations, codes, or rulings of governmental units having jurisdiction as well as standards of NFPA, and serving utility requirements.

3.2 Obtain permits, fees, inspections, meter and the like, associated with work in each section of this Division.

3.3 Installation procedures, methods and conditions shall comply with the latest requirements of the Federal Occupational Safety and Health Act (OSHA).

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ARTICLE 4 EXAMINATION OF PREMISES

4.1 Examine the construction drawings and premises prior to bidding. No allowances will be made for not being knowledgeable of existing conditions.

ARTICLE 5 STANDARDS

5.1 The following standard publications of the latest editions enforced and supplements thereto shall form a part of these specifications. All electrical work must, as a minimum, be in accordance with these standards.

5.1.1 2013 California Electrical Code (CEC), Part 3 Title 24 CCR.
5.1.2 National Fire Protection Association.
5.1.3 Underwriters' Laboratories, Inc. (UL).
5.1.4 Certified Ballast Manufacturers' Association (CBM).
5.1.5 National Electrical Manufacturers' Association (NEMA).
5.1.6 Institution of Electrical & Electronics Engineers (IEEE).
5.1.7 American Society for Testing & Materials (ASTM).
5.1.8 National Board of Fire Underwriters (NBFU).
5.1.9 National Board of Standards (NBS).
5.1.10 American National Standards Institute (ANSI).
5.1.11 Insulated Power Cable Engineers Association (IPECS).
5.1.12 Electrical Testing Laboratories (ETL).
5.1.13 National Electrical Safety Code (NESC).
5.1.14 2013 California Building Code (CBC), Part 2, Title 24 CCR.
5.1.15 2013 California Fire Code (CFC), Part 9, Title 24, CCR.
5.1.16 2013 NFPA 72 with California State Amendments
5.1.17 National Electrical Testing Association (NETA), 2010 or most current

ARTICLE 6 DEFINITIONS

6.1 Concealed: Hidden from sight, as in trenches, chases, hollow construction, or above furred spaces, hung ceilings - acoustical or plastic type, or exposed to view only in tunnels, attics, shafts, crawl spaces, unfinished spaces, or other areas solely for maintenance and repair.

6.2 Exposed, Non-Concealed, Unfinished Space: A room or space that is ordinarily accessible only to building maintenance personnel, a room noted on the 'finish schedule' with exposed and unpainted construction for walls, floors, or ceilings or specifically mentioned as 'unfinished'.

6.3 Finish Space: Any space ordinarily visible, including exterior areas.

ARTICLE 7 WORK AND MATERIALS

7.1 Unless otherwise specified, all materials must be new and of the best quality. Materials previously incorporated into other projects, salvaged, or refurbished are not considered new. Perform all labor in a thorough and workmanlike manner.

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7.2 All materials provided under the contract must bear the UL label where normally available. Note that this requirement may be repeated under equipment specifications. In general, such devices as will void the label should be provided in separate enclosures and wired to the labeled unit in proper manner.

ARTICLE 8 SHOP DRAWINGS AND SUBMITTALS

8.1 Submit shop drawings and all data in accordance with Division 1 of these specifications and as noted below for all equipment provided under this Division.

8.2 Shop drawings submittals demonstrate to the Architect that the Contractor understands the design concept. The Contractor demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods of material and equipment he intends to use. If deviations, discrepancies, or conflicts between submittals and specifications are discovered either prior to or after submittals are processed, notify the Architect immediately.

8.3 Manufacturer's data and dimension sheets shall be submitted giving all pertinent physical and engineering data including weights, cross sections and maintenance instructions. Standard items of equipment such as receptacles, switches, plates, etc., which are cataloged items, shall be listed by manufacturer.

8.4 Index all submittals and reference them to these specifications. All submittal items shall be assembled and submitted, one for each specification section. (Multiple specification sections may be grouped together in one common submittal binder, as long as each individual section is clearly identified.) Partial or incomplete submittal sections will not be reviewed.

ARTICLE 9 EQUIPMENT PURCHASES

9.1 Arrange for purchase and delivery of all materials and equipment within 20 days after approval of submittals. All materials and equipment must be ordered in ample quantities for delivery at the proper time. If items are not on the project in time to expedite completion, the Owner may purchase said equipment and materials and deduct the cost from the contract sum.

9.2 Provide all materials of similar class or service by one manufacturer.

ARTICLE 10 COOPERATIVE WORK

10.1 Correct without charge any work requiring alteration due to lack of proper supervision or failure to make proper provision in time. Correct without charge any damage to adjacent work caused by the alteration.

10.2 Cooperative work includes: General supervision and responsibility for proper location and size of work related to this Division, but provided under the other sections of these specifications, and installation of sleeves, inserts, and anchor bolts for work under each section in this Division.

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ARTICLE 11 VERIFICATION OF DIMENSIONS

11.1 Scaled and figured dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions, etc., and be responsible for properly fitting equipment and materials together and to the structure in spaces provided.

11.2 Drawings are essentially diagrammatic, and many offsets, bends, pull boxes, special fittings, and exact locations are not indicated. Carefully study drawings and premises in order to determine best methods, exact location, routes, building obstructions, etc. and install apparatus and equipment in manner and locations to avoid obstructions, preserve headroom, keep openings and passageways clear, and maintain proper clearances.

ARTICLE 12 CUTTING AND PATCHING

12.1 All cutting and patching shall be in accordance with Division 1 of these specifications and as noted below.

12.2 Cut existing work and patch as necessary to properly install new work. As the work progresses, leave necessary openings, holes, chases, etc., in their correct location. If the required openings, holes, chases, etc., are not in their correct locations, make the necessary corrections at no cost to the Owner. Avoid excessive cutting and do not cut structural members including wall framing without the consent of the Architect.

ARTICLE 13 CLOSING-IN OF UNINSPECTED WORK

13.1 Cover no work until inspected, tested, and approved by the Architect. Where work is covered before inspection and test, uncover it and when inspected, tested, and approved, restore all work to original proper condition at no additional cost to Owner.

ARTICLE 14 EXCAVATION AND BACKFILL

14.1 All excavation and backfill shall be in accordance with Division 1 of these specifications and as noted below.

14.2 Perform all necessary excavation, shoring, and backfilling required for the proper laying of all conduits inside the building and premises, and outside as may be necessary.

14.3 Excavate all trenches open cut, keep trench banks as nearly vertical as practicable, and sheet and brace trenches where required for stability and safety. Excavate trenches true to line and make bottoms no wider than necessary to provide ample work room. Grade trench bottoms accurately. Machine grade only to the top line of the conduits, doing the remainder by hand. Do not cut any trench near or under footings without first consulting the Architect. All trenches shall be done in accordance with OSHA standards and regulations.

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14.4 Backfilling shall be done with each layer compacted before another layer is added. No stones or coarse lumps shall be laid directly on a conduit or conduits.

14.5 Trenches shall be filled with the specified material. Sod, if any, shall be removed in cut sections and replaced in same manners.

14.6 Provide pumps and drainage of all open trenches for purposes of installing electrical duct and wiring.

14.7 Perform all backfilling in accordance with the requirements of and under the direction of the Geotechnical Engineer.

14.8 Where new underground trenching is required on sites or in any area where existing underground utilities exist, the Contractor shall provide an independent professional utility locating service to locate exact vertical and horizontal locations of all existing utilities. Where existing utilities are found the Contractor shall hand dig those areas to avoid disruption. The Contractor shall be responsible for immediate repairs to existing underground utilities damaged during construction. The Contractor shall repair all existing asphalt, concrete and landscape surfaces damaged or removed during construction to match their original conditions. Where trenching extends through public streets or roadways, the Contractor shall notify underground service alert in addition to the independent locating service 48 hours before start of construction to determine location of existing utilities by calling (800) 422-4133.

ARTICLE 15 CONCRETE

15.1 Where used for structures to be provided under the contract such as bases, etc., concrete work, and associated reinforcing shall be as specified under Division 3 of these specifications.

15.2 See other sections for additional requirements for underground vaults, cable ducts, etc.

ARTICLE 16 ACCESSIBILITY

16.1 Install all control devices or other specialties requiring reading, adjustment, inspection, repairs, removal, or replacement conveniently and accessibly throughout the finished building.

16.2 All required access doors or panels in walls and ceilings are to be furnished and installed as part of the work under this Section. Refer to Division 1 of these specifications and as noted below.

16.3 Where located in fire rated assemblies, provide doors which match the rating of the assembly and are approved by the jurisdictional authority.

16.4 Refer to 'finish schedule' for types of walls and ceilings in each area and the architectural drawings for rated wall construction.

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16.5 Coordinate work of the various sections to locate specialties requiring accessibility with others to avoid unnecessary duplication of access doors.

ARTICLE 17 FLASHING

17.1 Flash and counter flash all conduits penetrating roofing membrane as shown on Architectural drawings. All work shall be in accordance with Division 7 of these specifications.

ARTICLE 18 IDENTIFICATION OF EQUIPMENT

18.1 All electrical equipment shall be labeled, tagged, stamped, or otherwise identified in accordance with the following schedules:

18.1.1 General:

18.1.1.1 In general, the installed laminated nameplates as hereinafter called for shall also clearly indicate its use, areas served, circuit identification, voltage and any other useful data.

18.1.1.2 All auxiliary systems, including communications, shall be labeled to indicate function.

18.1.2 Lighting and Local Panelboards:

18.1.2.1 Panel identification shall be with white and black micarta nameplates. Letters shall be no less than 3/8" high.

18.1.2.2 Circuit directory shall be two column typewritten card set under glass or glass equivalent. Each circuit shall be identified by the room number and/or number of unit and other pertinent data as required.

18.1.3 Distribution Switchboards and Feeders Sections:

18.1.3.1 Identification shall be with 1" x 4" laminated white micarta nameplates with black lettering on each major component, each with name and/or number of unit and other pertinent data as required. Letters shall be no less than 3/8" high.

18.1.3.2 Circuit breakers and switches shall be identified by number and name with 3/8" x 1-1/2" laminated micarta nameplates with 3/16" high letters mounted adjacent to or on circuit breaker or switch.

18.1.4 Disconnect Switches, Motor Starters and Transformers:

18.1.4.1 Identification shall be with white micarta laminated labels and 3/8" high black lettering.

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18.1.5 All communication system terminal boxes including T.V., telephone/intercom, security, fire alarm, clock, and computer networking shall be provided with white micarta laminated labels and 3/8" high black lettering.

ARTICLE 19 CONSTRUCTION FACILITIES

19.1 Furnish and maintain from the beginning to the completion all lawful and necessary guards, railings, fences, canopies, lights, warning signs, etc. Take all necessary precautions required by City, State Laws, and OSHA to avoid injury or damage to any persons and property.

19.2 Temporary power and lighting for construction purposes shall be provided under this Section. All work shall be in accordance with Division 1 of these specifications.

ARTICLE 20 GUARANTEE

20.1 Guarantee all material, equipment and workmanship for all sections under this Division in writing to be free from defect of material and workmanship for one year from date of final acceptance, as outlined in the general conditions. Replace without charge any material or equipment proven defective during this period. The guarantee shall include performance of equipment under all site conditions, conditions of load, installing any additional items of control and/or protective devices, as required.

ARTICLE 21 PATENTS

21.1 Refer to the General Conditions for Contractor's responsibilities regarding patents.

ARTICLE 22 PLUMBING (DIVISION 22) / HEATING, VENTILATING, AND AIR CONDTIONING (DIVISION 23) / ELECTRICAL – COORDINATION REQUIREMENTS

22.1 All electrical work performed for this project shall conform to the California Electrical Code, to Local Building Codes and in conformance with Division 22, 23, and 26 of these specifications, whether the work is provided under the “Plumbing”, “Heating, Ventilating, and Air Conditioning”, or the “Electrical” Division of these specifications. Where the Division 22 and/or Division 23 Contractor is required to provide electrical work, he shall arrange for the work to be done by a licensed Division 26 Contractor, using qualified electricians. The Division 22 and/or Division 23 Contractor shall be solely and completely responsible for the correct functioning of all equipment regardless of who provided the electrical work.

22.2 The work under Division 22 and/or Division 23 shall include the following:

22.2.1 All motors required by mechanical equipment.

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22.2.2 All starters for mechanical equipment which are not provided under the electrical division as part of a motor control center or otherwise indicated on the electrical drawings.

22.2.3 All wiring interior to packaged equipment furnished as an integral part of the equipment.

22.2.4 All control **wiring and conduit** for mechanical control systems.

22.2.5 All control systems required by mechanical equipment.

22.3 The work under Division 26 shall include the following:

22.3.1 All power wiring and conduit; and conduit only for EMS control conductors between each building and the main control panel.

22.3.2 Electrical disconnects as shown on the electrical drawings.

22.3.3 Starters forming part of a motor control center.

22.4 All power wiring and conduit to equipment furnished under Division 22 and/or Division 23 shall be provided under Division 26. Control wiring and conduit, whether line voltage or low voltage, shall be provided under the division which furnishes the equipment.

22.5 Power wiring shall be defined as all wiring between the panelboard switchboard overcurrent device, motor control center starter or switch, and the safety disconnect switch or control panel serving the equipment. Also, the power wiring between safety disconnect switch and the equipment line terminals.

22.6 Control wiring shall be defined as all wiring, either line voltage or low voltage, required for the control and interlocking of equipment, including but not limited to wiring to motor control stations, solenoid valves, pressure switches, limit switches, flow switches, thermostats, humidistats, safety devices, smoke detectors, and other components required for the proper operation of the equipment.

22.7 All motor starters which are not part of motor control centers and which are required for equipment furnished under this Division shall be furnished and installed by the Division furnishing the equipment and power wiring connected under Division 26. Motor starters and control devices in motor control centers shall be furnished and installed under Division 26.

22.8 Division 26 Contractor shall make all final connections of power wiring to equipment furnished under this Division.

22.9 Wiring diagrams complete with all connection details shall be furnished under each respective Section.

22.10 Motor starters supplied by Plumbing and/or Heating, Ventilating and Air Conditioning shall be fused combination type minimum NEMA Size 1, and

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conform to appropriate NEMA standards for the service required. Provide NEMA type 3R/12 gasketed enclosures in wet locations. Provide all starters with appropriately sized overload protection and heater strips provided in each phase, hand/off auto switches, a minimum of 2 NO and NC auxiliary contacts as required, and an integral disconnecting means. For ½ horsepower motors and below, when control requirements do not dictate the use of a starter, a manual motor starter switch with overload protection in each phase may be provided. Acceptable manufacturers are Allen Bradley, General Electric, Square D, Furnas and Cutler Hammer.

ARTICLE 23 EQUIPMENT ROUGH-IN

23.1 Rough-in all equipment, fixtures, etc. as designed on the drawings and as specified herein. The drawings indicate only the approximate location of rough-ins. Mounting heights of all switches, receptacles, wall mounted fixtures and such equipment must be coordinated with the Architectural Designs. The Contractor shall obtain all rough-in information before progressing with any work for rough-in connections. Minor changes in the contract drawings shall be anticipated and provided for under this Division of the specifications to comply with rough-in requirements.

ARTICLE 24 OWNER FURNISHED AND OTHER EQUIPMENT

24.1 Rough-in and make final connections to all Owner furnished equipment shown on the drawings and specified, and all equipment furnished under other sections of the specifications.

ARTICLE 25 EQUIPMENT FINAL CONNECTIONS

25.1 Provide all final connections for the following:

25.1.1 All equipment furnished under this Division.

25.1.2 Electrical equipment furnished under other sections of the specification.

25.1.3 Owner furnished equipment as specified under this Division.

ARTICLE 26 INSERTS, ANCHORS, AND MOUNTING SLEEVES

26.1 Inserts and anchors must be:

26.1.1 Furnished and installed for support of work under this Division.

26.1.2 Mounting of equipment that is of such size as to be free standing and that equipment which cannot conveniently be located on walls, such as motor starters, etc., shall be rigidly supported on a framework of galvanized steel angle of Unistrut or B-line systems with all unfinished edges painted.

26.1.3 Furnish and install all sleeves as required for the installation of all work under all Sections of this Division and for all communication systems

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including any communication systems described in this Section which are bid to the General Contractor. Sleeves through floors, roof, and walls shall be as described in “Conduit and Fittings” Section 26 05 33.

ARTICLE 27 SEISMIC ANCHORING

27.1 All switchgear and other free standing electrical equipment or enclosures shall be anchored to the floor and braced at the top of the equipment to the structure. Where details have not been provided on the drawings, anchorage shall comply with CBC Section 1616A.1.12. The Contractor shall submit drawings signed by the Contractors registered structural Engineer indicating method of compliance prior installation.

27.2 All sound systems, communication, signal or data networking equipment or enclosures shall be anchored to the structure. Where details have not been provided on the drawings, anchorage shall comply with CBC Section 1616A.1.12. The Contractor shall submit drawings signed by the Contractors registered Structural Engineer indicating method of compliance prior to installation.

ARTICLE 28 RUST PROOFING

28.1 Rust proofing must be applied to all ferrous metals and shall be in accordance with Section 05500 of these specifications and as noted below.

28.1.1 Hot-dipped galvanized shall be applied and after forming of angle-iron, bolts, anchors, etc.

28.1.2 Hot-dipped galvanized coating shall be applied after fabrication for junction boxes and pull boxes cast in concrete.

ARTICLE 29 GENERAL WIRING

29.1 Where located adjacent in walls, outlet boxes shall not be placed back to back, nor shall extension rings be used in place of double boxes, all to limit sound transmission between rooms. Provide short horizontal nipple between adjacent outlet boxes, which shall have depth sufficient to maintain wall coverage in rear by masonry wall.

29.2 In those instances where outlet boxes, recessed terminal boxes, or recessed equipment enclosures are installed in a fire rated assembly, provide "Flamesafe FSD 1077" fire stopping pads or approved equal, over the outlet or box.

29.3 Complete rough-in requirements of all equipment to be wired under the contract are not indicated. Coordinate with respective trades furnishing equipment or with the Architect as the case may be for complete and accurate requirements to result in a neat, workmanlike installation.

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ARTICLE 30 SEPARATE CONDUIT SYSTEMS

30.1 Each electrical and signal system shall be contained in a separate conduit system as shown on the drawings and as specified herein. This includes each power system, each lighting system, each signal system of whatever nature, telephone, standby system, sound system, control system, fire alarm system, etc.

30.2 Further, each item of building equipment must have its own run of power wiring. Control wiring may be included in properly sized conduit for equipment feeders of #6 AWG and smaller, having separate conduit for larger sizes.

ARTICLE 31 CLEANUP

31.1 In addition to cleanup specified under other sections, thoroughly clean all parts of the equipment. Where exposed parts are to be painted, thoroughly clean off any spattered construction materials and remove all oil and grease spots. Wipe the surface carefully and scrape out all cracks and corners.

31.2 Use steel brushes on exposed metal work to carefully remove rust, etc., and leave smooth and clean.

31.3 During the progress of the work, keep the premises clean and free of debris.

ARTICLE 32 UTILITY SERVICES

32.1 The Division 26 Contractor shall contact the serving utility companies; notify the serving power, telephone and cable TV utilities of the following:

32.1.1 Name and address of Contractor.

32.1.2 Estimated times of construction start, completion and required service connections.

32.1.3 Project service voltage, phase load, and service size.

32.1.4 Provide to the Architect written verification from each utility company indicating their concurrence with the contract documents.

32.2 Contractor shall notify underground service alert 48 hours before start of construction to determine location of existing utilities by calling (800) 422-4133. All work shall be in accordance with the Division 1 Sections of these specifications.

32.3 All utility company requirements shall be complied with and approval shall be obtained from the utility company for service equipment. Such as, verification of a field test of the ground fault protection on the main service equipment, panic hardware and etc.

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ARTICLE 33 TEST AND INSPECTION PROCEDURES – EXISTING MEDIUM VOLTAGE, AIR INSULATED, CIRCUIT BREAKER TESTS

33.1 Tests shall be done in accordance with ANSI/NETA Standards and by a contractor certified in medium voltage testing and procedures. Contractor qualifications shall be submitted to the electrical engineer of record for approval.

33.2 Testing shall not be done or scheduled until the outage is scheduled and approved by the owner. Outage shall not exceed 24 hours unless approved by the owner and coordinated with the CM and Architect of Record.

33.3 Visual and Mechanical Inspection

33.3.1 Inspect physical and mechanical condition.

33.3.2 Inspect anchorage, alignment, and grounding.

33.3.3 Verify that all maintenance devices are available for servicing and operating the breaker.

33.3.4 Clean the Unit.

33.3.5 Inspect arc chutes.

33.3.6 Inspect moving and stationary contacts for condition, wear, and alignment.

33.3.7 Close/open breaker and check for binding, friction, contact alignment, contact sequence, and penetration.

33.3.8 Perform all mechanical operation tests on the operating mechanism in accordance with manufacturer's published data.

33.3.9 Inspect bolted electrical connections for high resistance using one of the following methods:

33.3.9.1 Use of a low-resistance ohmmeter in accordance with Section 33.4.

33.3.9.2 Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data.

33.3.9.3 Perform a thermographic survey in accordance with NETA standards.

33.3.10 Verify cell fit and element alignment.

33.3.11 Verify racking mechanism operation.

33.3.12 Inspect puffer operation.

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33.3.13 Use appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.

33.3.14 Record as-found and as-left operation-counter readings.

33.4 Electrical Tests

33.4.1 Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable. See Section 33.3.

33.4.2 Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with the circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data.

33.4.3 Perform a contact/pole-resistance test.

33.4.4 With the breaker in a test position, perform the following tests:

33.4.4.1 Trip and close breaker with the control switch.

33.4.4.2 Trip breaker by operating each of its protective relays. Recalibrate and adjust relay settings based on time current study to be done for the project.

33.4.4.3 Verify mechanism charge, trip-free, and antipump functions.

33.4.4.4 Verify blowout coil circuit continuity.

33.4.4.5 Verify operation of heaters, if applicable.

33.4.4.6 Test instrument transformers in accordance with NETA standards.

33.5 Test Values

33.5.1 Test Values – Visual and Mechanical

33.5.1.1 Bolt-torque levels should be in accordance with manufacturer's published data.

33.5.1.2 Results of the thermographic survey shall be in accordance with NETA standards.

33.5.1.3 Compare travel and velocity values to manufacturer's published data.

33.5.2 Test Values – Electrical

33.5.2.1 Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from

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those of similar bolted connections by more than 50 percent of the lowest value.

33.5.2.2 Circuit breaker insulation resistance should be in accordance with manufacturer's published standards.

33.5.2.3 Insulation-resistance values of circuit breakers should be in accordance with manufacturer's published data. Values of insulation resistance less than manufacturer's recommendations should be investigated.

33.5.2.4 Microhm or dc millivolt drop values shall not exceed the high levels of the normal range as indicated in the manufacturer's published data. If manufacturer's data is not available, investigate values that deviate from adjacent poles or similar breakers by more than 50 percent of the lowest value.

33.5.2.5 Breaker mechanism charge, close, open, trip, trip-free, and antipump features shall function as designed.

33.5.2.6 Minimum pickup for trip and close coils shall be in accordance with manufacturer's published data.

33.5.2.7 Power-factor or dissipation-factor and capacitance values should be within ten percent of nameplate rating for bushings. Hot collar tests are evaluated on a milliampere/milliwatt loss basis, and the results should be compared to values of similar bushings.

33.5.2.8 If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the over potential test, the circuit breaker is considered to have passed the test.

33.5.2.9 The blowout coil circuit should exhibit continuity.

33.5.2.10 Heaters should be operational.

33.5.2.11 The results of instrument transformer tests shall be in accordance with manufacturer's standards.

ARTICLE 34 PAINTING

34.1 Paint all unfinished metal as required in accordance with Division 1 of these specifications. (Galvanized and factory painted equipment shall be considered as having a sub-base finish.)

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ARTICLE 35 GENERAL DEMOLITION REQUIREMENTS

35.1 Remove existing work and items which are required to be removed in such manner that minimum damage and disturbance is caused to adjacent and connection work scheduled to remain. Repair or replace existing work schedule.

35.2 Include preparation of existing areas to receive new materials and removal of materials and equipment to alter or repair the existing building as indicated and as specified.

35.3 Perform demolition exercising proper care to prevent injury to the public, workmen and adjoining property.

35.4 Perform the removal, cutting, drilling of existing work with extreme care and use small tools in order not to jeopardize the structural integrity of the building.

35.5 Rebuild to existing condition or better, existing work which has to be removed to allow the installation of new work as required.

35.6 Remove, protect and reinstall existing items as indicated. Replace materials scheduled for reuse which are damaged by the Contractor to the extent that they cannot be reused, with equal quality material, and installation.

35.7 Do not reuse in this project materials and items removed from existing site or building, except with specific written approval by the Architect in each case, unless such removed material or item is specifically indicated or specified to be reused.

35.8 Remove materials and equipment indicated to be salvaged for reinstallation and store to prevent damage, and reinstall as the work progresses. Do not reuse in this project, other materials and equipment removed from existing site or building, except with specific written approval by the Architect in each case.

35.9 Patch areas requiring patching, including damage caused by removing, relocating or adding fixtures and equipment, damages caused by demolition at adjacent materials.

35.10 Do not stockpile debris in the existing building, without the approval of the Architect. Remove debris as it accumulates from removal operations to a legal disposal area.

35.11 Contractor to assume existing oil filled and dry transformers, oil switches, ballasts, lamps, wooden poles, cross arms, computers, computer monitors, and conductor insulation containing materials considered hazardous. Comply with local, state and federal regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution. Contractor shall be responsible for removal of the above hazardous materials where encountered. Include all costs for such removal as part of this contract.

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35.12 All fluorescent, compact fluorescent, high intensity discharge, metal halide, mercury vapor, high and low pressure sodium, and neon lamps are to be disposed of as required by the California Waste Rule Regulations as described in the California Code of Regulations, Title 22, Division 4.5 and Chapter 23.

35.13 **Communication System:** Where new communication systems, (including telephone, intercom, clock, security, fire alarm, data, multimedia, CATV or lighting controls) are installed to replace existing systems, unless where otherwise directed the existing systems shall remain fully operational until the new system has been installed and tested. Demolition of the existing systems shall include removal of all equipment and associated wiring and exposed conduits and providing new blank covers for all abandoned device locations.

35.14 **Salvage Power Equipment:** The Contractor shall carefully remove all existing switchboards, panelboards, transformers, and confirm in writing which items the Owner wishes to keep. These items shall be transported to the Owner's maintenance facilities by the Contractor. All remaining items shall be disposed of by the Contractor.

35.15 **Salvage Lighting Equipment:** The Contractor shall confirm in writing which items the Owner wishes to keep. These items shall be transported to the Owner's maintenance facilities by the Contractor. All remaining items shall be disposed of by the Contractor.

35.16 **Salvage Communication Equipment:** The Contractor shall carefully remove all communication devices (telephone, intercom, clock, security, fire alarm, data, multimedia, CATV or lighting controls) and box each type of devices separately. The Contractor shall deliver all items to the Owner's maintenance facility.

ARTICLE 36 PROJECT CLOSEOUT

36.1 Prior to completion of project, compile a complete equipment maintenance manual for all equipment supplied under sections of this Division, in accordance with Division 1 of these specifications and as described below.

36.2 Equipment Lists and Maintenance Manuals:

36.2.1 Prior to completion of job, Contractor shall compile a complete equipment list and maintenance manuals. The equipment list shall include the following items for every piece of material equipment supplied under this Section of the specifications:

36.2.1.1 Name, model, and manufacturer.

36.2.1.2 Complete parts drawings and lists.

36.2.1.3 Local supply for parts and replacement and telephone number.

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36.2.1.4 All tags, inspection slips, instruction packages, etc., removed from equipment as shipped from the factory, properly identified as to the piece of equipment it was taken from.

36.3 Maintenance manuals shall be furnished for each applicable section of the specifications and shall be suitably bound with hard covers and shall include all available manufacturers' operating and maintenance instructions, together with "as-built" drawings to properly operate and maintain the equipment. The equipment lists and maintenance manuals shall be submitted in duplicate to the Architect for approval not less than 10 days prior to the completion of the job. The maintenance manuals shall also include the name, address, and phone numbers of all subcontractors involved in any of the work specified herein. Four copies of the maintenance manuals bound in single volumes shall be provided.

ARTICLE 37 RECORD DRAWINGS

37.1 The Division 26 Contractor shall maintain record drawings as specified in accordance with Division 1 of these specifications, and as noted below.

37.2 Drawings shall show locations of all concealed underground conduit runs, giving the number and size of conduit and wires. Underground ducts shall be shown with cross section elevations and shall be dimensioned in relation to permanent structures to indicate their exact location. Drawing changes shall not be identified only with referencing CORs and RFIs, the drawings shall reflect all of the actual additions or changes made. All as-built drawing information shall be prepared by the contractor in AutoCAD, updating the contract computer files as needed to reflect actual installed conditions for all site plans, lighting, power, communication, networking, audio visual, security or fire alarms systems included in the scope of work for this project.

37.3 One set of these record drawings shall be delivered to the Architect. The engineer will review documents for completeness, and will not be responsible for editing contractor computer files.

ARTICLE 38 CHANGES AND EXTRA WORK

38.1 When **changes** in work are requested, the Division 26 Contractor shall provide unit prices for the work involved in accordance with Division 1 of these specifications, and the following:

38.1.1 The material Costs shall **not exceed** the latest edition of the "Trade Service" end column "C" price list. The materials prices may be higher only where the Contractor can produce invoices to substantiate higher material costs. The Contractor shall submit a print out copy of the trade service sheets with the change order to substantiate these values.

38.1.2 The labor Costs shall **not exceed** the latest edition of the "NECA Manual of Labor Units" **normal column**.

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38.2 When **credits** in work are requested, the Division 26 Contractor shall provide unit prices for the work involved in accordance with Division 1 of these specifications, and the following:

38.2.1 The Material Costs shall **not be less than 80% of** the latest edition of the "Trade Service" end column price list. The materials prices may be lower only where the Contractor can produce invoices to substantiate lower material costs. Restocking fees may also be included in this amount where applicable.

38.2.2 The Labor Costs shall **not be less than 80% of** the latest edition of the "NECA Manual of Labor Units" **normal column**.

38.3 Conduit pricing for conduits of all types sized 3" or smaller.

When changes in the scope of work require the Contractor to estimate conduit Installations, they shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for conduit installation represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

38.3.1 Couplings.

38.3.2 Set Screw or Compression Fittings, locknuts, Bushings and washers.

38.3.3 Conduit straps and associated screws or nails.

38.3.4 LB fittings or other specialty fittings or specialty mounting hardware may be included where needed.

38.4 Wire pricing for all types and sizes.

When changes in the scope of work require the Contractor to estimate wire installations they shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for wire installation represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

38.4.1 Locknuts, Bushings, tape, wire markers.

38.5 When changes in the scope of work require other equipment installations such as lighting fixtures, panelboards, switchboards, wiring devices, communications equipment etc. the Contractor shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for these equipment items represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

38.5.1 Associated screws, nails, bolts, anchors or supports.

38.5.2 Locknuts, washers, tape.

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38.6 The total labor hours for extra work will be required to be calculated as follows:

38.6.1 Change orders with 1 to 30 total labor hours

General Laborer	10%	of total labor hours
Journeyman	10%	of total labor hours
Foreman	80%	of total labor hours

38.6.2 Change orders with 31 to 100 total labor hours

General Laborer	20%	of total labor hours
Journeyman	40%	of total labor hours
Foreman	40%	of total labor hours

38.6.3 Change orders with over 100 total labor hours

General Laborer	30%	of total labor hours
Journeyman	50%	of total labor hours
Foreman	20%	of total labor hours

38.7 When change orders are issued which allow the work to be completed in the normal sequence of construction, the labor rates shall be based on the most current “Prevailing Wage” – straight time total hourly rate. When change orders require the Contractor to work out of sequence the “Prevailing Wage“ – daily overtime hourly rate shall apply. Special condition situations shall be reviewed on an individual basis for alternate hourly rate schedules.

38.8 Costs **will not** be permitted for additional supervision on site or office time for processing any change order other than the 10% overhead allowance as described in Division 1. Cost for special equipment required to install items for an individual change order are permitted and must be individually identified. Lump Sum cost for small tools or any other cost not specifically required for the change order are not permitted.

38.9 Contractor estimates shall be formatted to clearly identify each of the following:

38.9.1 Line item description of each type of material or labor item.

38.9.2 Description of quantity for each item.

38.9.3 Description of (material cost per / quantity).

38.9.4 Description of (labor cost per / quantity).

38.9.5 Description of total labor hour breakdown per Foreman, Journeyman or General Laborer as described above.

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ARTICLE 39 ELECTRONIC FILES

39.1 The Contractor shall make a ***written*** request directly to Johnson Consulting Engineers for electronic drawing files. As a part of the written request, please include the following information:

39.1.1 Clearly indicate each drawing sheet needed (i.e., E1.1, E2.1, etc.).

39.1.2 Identify the name, phone number, mailing address and e-mail address of the person to receive the files.

39.1.3 Provide written confirmation and agreement with the requirements described for payment of computer files, as described below.

39.2 Detail or riser diagram sheets, or any other drawings other than floor plans or site plans, ***will not be made available to the Contractor***.

39.3 Files will only be provided in the AutoCAD format in which they were created.

39.4 Requests for files will be processed as soon as possible; a minimum of 7 working days should be the normal processing time. The Contractor shall be completely responsible for requesting the files in time for their use.

39.5 CAD files will be made available via e-mail or on disk, depending on the quantity of files requested. The Contractor requesting the files will be required to pay $50.00 per drawing plan, or $300.00 maximum, whichever is ***less***.

END OF SECTION

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SECTION 26 05 19

POWER CONDUCTORS

PART 1 – GENERAL

1.1 Furnish and install wire and cable for branch circuits and feeders specified herein and as shown on the electrical drawings.

1.2 Submittals: Submit manufacturers' data for the following items:

1.2.1 All cables and terminations

1.3 <u>Common submittal mistakes which will result in the submittals being rejected:</u>

1.3.1 Not including all items listed in the above itemized description.

1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining, or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.3 Not including actual manufacturer's catalog information of proposed products.

1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed

PART 2 – PRODUCTS

2.1 Wire and cable Rated 120 volt to 600 volt.

2.1.1 All wire and cable shall be new, 600 volt insulated copper, of types specified below for each application. All wire and cable shall bear the UL label and shall be brought to the job in unbroken packages. Wire insulation shall be the color as specified herein and shall be type THWN-2. Insulated conductors shall be installed in all exterior exposed raceways. Conductors for branch circuit lighting, receptacle, power and miscellaneous systems shall be a minimum of No. 12 AWG. Increase conductor size to No. 10 AWG for 120 volt circuits greater than 100 feet from the panel to the load and for 277 volt circuits greater than 200 feet from the panel to the load. Circuit home-runs indicated to be larger than No. 12 must be increased the entire length of the circuit, including equipment grounding conductor. Wire sizes No. 14 through No. 10 shall be solid. No. 8 and larger shall be stranded.

2.1.2 Aluminum conductors will be permitted (only where specifically identified on the drawings. See "600 Volt Feeder Schedule") in sizes 2/0 or larger. Conductors shall be listed by Underwriters Laboratories (UL) and suitable

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for operation at 600 volts or less, at a maximum operating temperature of 90N C maximum in wet or dry locations. Conductors shall be marked "SUN-RES". Aluminum alloy conductors shall be compact stranded conductors of STABILOY® (AA-8030) as manufactured by Alcan Cable or Listed equal. AA-8000 Series aluminum alloy conductor material shall be recognized by The Aluminum Association.

2.1.3 MC type armored cable reference Section 26 05 33.

2.2 Wire and cable for systems below120 volts.

2.2.1 All low voltage and communications systems cables routed underground shall be provided with a moisture resistant outer jacket, West Penn "Aquaseal" or equal, unless otherwise specified.

PART 3 - EXECUTION

3.1 Wire and cable shall be pulled into conduits without strain using powdered soapstone, mineralac, or other approved lubricant. In no case shall wire be repulled if same has been pulled out of a conduit run for any purpose. No conductor shall be pulled into conduit until conduit system is complete, including junction boxes, pull boxes, etc.

3.2 All connections of wires shall be made as noted below:

3.2.1 Connections to outlets and switches: Wire formed around binding post of screw.

3.2.2 No. 10 wire and smaller: Circuit wiring connections to lighting fixtures and other hard wired equipment shall be made with pressure type solderless connectors, Buchanan, Scotchlock, Wing Nut, or approved equal. Alternate "WAGO" #773 series or "IDEAL" #32, 33, 34 and 39 series push wire style connectors are also acceptable.

3.3 All wiring shall be continuous without splicing unless where specifically noted on the drawings or where permitted below.

3.3.1 No. 10 wire and smaller above grade: Quantities as needed, connection made with pressure type solderless connectors, Scotchlock or equal.

3.3.2 No. 10 wire and smaller below grade: Quantities as needed, connection made with 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate products must be UL listed for direct burial/submersible and rated to (1000V).

3.3.3 No. 8 wire and larger above grade: Quantities only where indicated, 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate

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products must be UL listed for direct burial/submersible and rated to (1000V).

3.3.4 No. 8 wire and larger below grade: Quantities only where indicated, 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate products must be UL listed for direct burial/submersible and rated to (1000V).

3.4 All wiring throughout shall be color coded as follows:

	480 volt system	208 or 240 volt system
A Phase	Brown	Black
B Phase	Orange	Red
C Phase	Yellow	Blue
Neutral	Grey	White
Ground	Green	Green

3.5 Wiring must be color coded throughout its entire length, except feeders may have color coded plastic tape at both ends and any other accessible point.

3.6 All control wiring in a circuit shall be color coded, each phase leg having a separate color, and with all segments of the control circuit, whether in apparatus or conduit, utilizing the same color coding.

3.7 At all terminations of control wiring, the wiring shall have a numbered T&B or Brady plastic wire marker.

3.8 Cables when installed are to be properly trained in junction boxes, etc., and in such a manner as to prevent any forces on the cable which might damage the cable.

3.9 All conductors to be installed into a common raceway, shall be pulled into the raceway at the same time.

3.10 All conductors shall be installed in such a manner as to not exceed the manufacturers' recommended pulling tension and bending radius. The equipment used for pulling must be specifically designed for the purpose. Motorized vehicles such as pickup trucks, are not acceptable.

END OF SECTION

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SECTION 26 05 26

GROUNDING

PART 1 – GENERAL

1.1 Furnish and install grounding and grounding conductors and electrodes as specified herein and as shown on the drawings.

1.2 Submit catalog data for all components.

1.3 **Common submittal mistakes which will result in the submittals being rejected:**

1.3.1 Not including all items listed in the above itemized description.

1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.3 Not including actual manufacturer's catalog information of proposed products.

1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – EXECUTION

2.1 Grounding

2.1.1 All panelboard cabinets, equipment, enclosures, and complete conduit system shall be grounded securely in accordance with pertinent sections of CEC Article 250. Conductors shall be copper. All electrically operated equipment shall be bonded to the grounded conduit system. All non-current carrying conductive surfaces that are likely to become energized and subject to personal contact shall be grounded by one or more of the methods detailed in CEC Article 250. All ground connections shall have clean contact surfaces. Install all grounding conductors in conduit and make connections readily accessible for inspection.

2.1.2 Provide an insulated equipment grounding conductor in all branch circuit and feeder raceway systems, sized in accordance with CEC 250-1122.

2.1.3 Provide an additional individual insulated grounding conductor for each circuit which contains an isolated ground receptacle or surge suppression receptacle.

2.1.4 Grounding of metal raceways shall be assured by means of provisions of grounding bushings on feeder conduit terminations at the panelboard,

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and by means of insulated continuous stranded copper grounding wire extended from the ground bus in the panelboard to the conduit grounding bushings.

2.1.5 Except for connections which access for periodic testing is required, make grounding connections which are buried or otherwise inaccessible by exothermite type process.

2.1.6 The following ohmic values shall be test certified for each item listed. A written report signed and witnessed by the project IOR shall be provided to the engineer. If the ohmic value listed cannot be obtained additional grounding shall be installed to reach the value listed.

2.1.6.1 Service. . . . . .10 ohms.

2.1.6.2 Step down transformers and non-current carrying metal parts . . . . . 25 ohms.

2.1.6.3 Manholes, handholes, etc. . . . . 10 ohms.

END OF SECTION

SECTION 26 05 33

CONDUIT AND FITTINGS

PART 1 – GENERAL

1.1 Furnish and install conduit and fittings as shown on the drawings and as specified herein.

1.2 Submit Manufacturer's data on the following:

1.2.1 Conduit.

1.2.2 Fittings

1.2.3 Fire stopping Material.

1.2.4 Surface Raceways.

1.2.5 Type MC cable, provide construction details and UL "E" number.

1.3 **Common submittal mistakes which will result in the submittals being rejected:**

1.3.1 Not including all items listed in the above itemized description.

1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.3 Not including actual manufacturer's catalog information of proposed products.

1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

2.1 Rigid steel conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT) and flexible metallic conduit shall be steel, hot dipped galvanized after fabrication.

2.2 PVC conduit shall be Carlon or approved equal.

2.3 Liquid tight flexible metal conduit shall be Anaconda Sealtite type UA or approved equal. Fittings shall be Appleton, Crouse-Hinds, Steel City, T&B, or equivalent.

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2.4 MC type armored cable, when utilized, shall be provided with the following:

2.4.1 Comply with UL 1479 and CEC 330-22(c).

2.4.2 90ºC, copper, THHN conductors.

2.4.3 Minimum #12 insulated grounding conductor.

2.4.4 Conductors sized No. 10 and smaller shall be solid, No. 8 and larger shall be stranded.

2.4.5 Oversized (150%) neutrals or separate neutrals shall be provided.

2.4.6 Increase phase conductors to No. 10 AWG for 120 volt circuits greater than 100 feet from panel to load and for 277 volt circuits greater than 200 feet from panel to load. Where required increase conductor sizes for entire length of circuit.

2.4.7 Interlocked armored **aluminum** sheath.

2.4.8 AC or BX type armored cable shall **not** be substituted in lieu of MC type cable.

2.4.9 Color code cable according to cable type and configuration.

2.4.10 Acceptable manufacturers are AFC and Alflex.

2.5 Fire stopping material shall provide an effective seal against fire, heat, smoke and fire gases. Fire stopping material shall be tested to comply with ASTME 814 and UL 1479. The submittal for this product shall include the UL listed system number and installation requirements for each type of penetration seal required for this project.

2.6 Each length of conduit shall be stamped with the name or trademark of the manufacturer and shall bear the UL label.

2.7 All plastic conduit shall be rigid, schedule 40, heavy wall PVC. All PVC conduit shall be UL listed. Underground utility company conduits shall comply with local utility co. requirements.

2.8 Plastic conduit shall be stored on a flat surface, and protected from the direct rays of the sun.

2.9 Where branch circuit or communication raceways cannot be concealed in ceilings or walls and are required to be exposed in interior spaces, provide nonmetallic surface raceway system sized per the manufacturer capacity requirements. A full complement of nonmetallic fittings must be available and matching device boxes and cover plates must be provided. The color of the raceway system, components and boxes shall be (white). Where data networking cabling is to be installed, all raceway fittings shall meet Category 5

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radius requirements. Where specific raceway types have been noted on the drawings they shall be as follows:

2.9.1	System 'SR'	Hubbell	WALLTRAK 1 series
		Wiremold	ECLIPSE PN05series
		Panduit	LD5 series
		Hellerman-Tyton	TSR2 series
2.9.2	System 'SR2'	Hubbell	WALTRAK 22
		Wiremold	2300D Series
		Panduit	D2P10
		Hellerman-Tyton	TSR3 series
2.9.3	System 'SR3'	Hubbell	BASETRAK series
		Wiremold	5400 - series
		Panduit	70 series
		Hellerman-Tyton	MCR Infostream" series

Provide with offset boxes, inline boxes may only be used where specifically shown on the drawings.

PART 3 – FITTINGS

3.1 All metallic fittings, including those for EMT, flexible conduit, or malleable iron. Die cast fittings of any other material are not permitted.

3.2 Locknuts shall be steel or malleable iron with sharp clean cut threads.

3.3 Entrance seals shall be 0.Z. type FSK or equivalent.

3.4 Bushings and locknuts: Where conduits enter boxes, panels, cabinets, etc., they shall be rigidly clamped to the box by locknuts on the outside, and a lock nut and plastic bushing on the inside of the box. All conduits shall enter the box squarely.

3.5 Furnish and install insulated bushings as per CEC article No. 300 - 4 (F) on all conduits. The use of insulated bushings does not exclude the use of double locknuts to fasten conduit to the box.

3.6 Transition from plastic to steel conduits shall be with PVC female threaded adaptors.

3.7 Couplings and connectors for rigid steel or IMC conduit must be threaded, or compression type (set screw fittings are not permitted).

3.8 Couplings and connectors for EMT shall be compression, watertight. Set screw connectors are not acceptable, except for systems below 120 volts.

3.9 MC type armored cable shall be provided with listed clamp type die cast zinc set screw connectors. Anti-short bushings shall be provided at all cable ends.

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3.10 Connectors for flexible metal conduit shall be steel or malleable iron with screw provided to clinch the conduit into the adapter body. For sizes up to ¾" a screw-in, "Jake type," fitting may be used.

3.11 Install approved expansion fittings, or liquid tight flex conduit with a minimum 6" slack for conduits passing through all expansion and seismic joints.

PART 4 - EXECUTION

4.1 All branch circuits shall be installed concealed in walls or above ceilings or in concrete floor slabs. PVC conduits installed in concrete floor slabs shall transition to PVC coated rigid steel where conduits penetrate above finished grade or finished floor.

4.2 Conduit sizes for various numbers and sizes of wire shall be as required by the CEC, but not smaller than ½" for power wiring and ¾" for communications and fire alarm systems unless otherwise noted. Conduit in slab or below grade shall be ¾" minimum trade size, unless otherwise identified.

4.3 Conduit size shall be such that the required number and sizes of wires can be easily pulled in and the Contractor shall be responsible for the selection of the conduit sizes to facilitate the ease of pulling. Conduit sizes shown on the drawings are minimum sizes in accordance with appropriate tables in the CEC. If because of bends or elbows a larger conduit size is required, the Contractor shall so furnish without further cost to the Owner.

4.4 The Contractor shall be entirely responsible for the proper protection of this work from the other trades on the job. When conduit becomes bent or holes are punched through same, or outlets moved after being roughed-in, the Contractor shall replace same, without additional cost to the Owner.

4.5 Rigid steel conduit or IMC shall be used as follows:

4.5.1 Exposed exterior locations.

4.5.2 Exposed interior locations below eight feet above floor, except in electrical rooms and closets.

4.5.3 In hazardous or classified areas as required by CEC.

4.6 EMT conduit shall be used for areas as follows:

4.6.1 All interior communications, signal, and data networking systems.

4.6.2 All interior power wiring systems where not required to be in rigid steel, IMC or flexible conduit.

4.7 Flexible conduit shall be used for areas as follows:

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4.7.1 To connect motors, transformers, and other equipment subjected to vibration or where specifically detailed on the drawings.

4.7.2 Flexible conduit shall not be used to replace EMT in other locations where the conduit will be exposed.

4.7.3 Flexible metal conduit shall be ferrous. Installation shall be such that considerable slack is realized. The conduit shall contain separate code sized grounding conductor.

4.7.4 Liquid tight flexible conduit shall be used in conformance with CEC in lengths not to exceed 4'. For equipment connections, route the conduit at 90 degrees to the adjacent path for point of connection. The conduit shall contain separate code sized grounding conductor. Use liquid tight flexible conduit for all equipment connections exposed in possible wet, corrosive or oil contaminated areas, e.g., shops and outside areas.

4.8 MC armored cable may be used as follows:

4.8.1 All branch circuit wiring for lighting and power circuits where permitted and installed in compliance with UL 1569 and CEC 330.

4.9 MC armored cable shall **not** be used for the following areas:

4.9.1 Any exterior, underground or buried in concrete circuits.

4.9.2 Any circuits feeding HVAC equipment or pumps or any circuit with 30 AMPs or greater overcurrent protection.

4.9.3 Any exposed interior locations except in electrical, communication or mechanical equipment rooms.

4.9.4 Any exposed interior damp/wet locations, kitchens, science classrooms, shop areas, or concealed in science classroom casework, unless provided with approved PVC jacket.

4.9.5 Any hazardous rated area.

4.10 Plastic conduit shall be used for all exterior underground, in slab, and below slab on grade conduit installations. Install bell ends at all conduit terminations in manholes and pull boxes. Where plastic conduit transitions from below grade to above grade, no plastic conduit shall extend above finished exterior grade, or above interior finished floor level.

4.11 Plastic conduit joints shall be made up in accordance with the manufacturer's recommendations for the particular conduit and coupling selected. Conduit joint couplings shall be made watertight. Plastic conduit joints shall be made up by brushing a plastic solvent cement on the inside of a plastic fitting and on the outside of the conduit ends. The conduit and fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly.

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4.12 All underground conduit depths shall be as detailed on the drawings or a minimum of 30" below finished grade (when not specifically detailed otherwise), for all exterior underground conduits. Where concrete slurry or concrete encasement is provided, include “Red” color dye in mixture.

4.13 All underground conduits for power systems (600v and higher), shall be concrete encased and a minimum of 48” below grade or as detailed on the drawings. Where concrete slurry or concrete encasement is provided, include “Red” color dye in mixture.

4.14 Conduit shall be continuous from outlet to outlet, cabinet or junction box, and shall be so arranged that wire may be pulled in with the minimum practical number of junction boxes.

4.15 All conduits shall be concealed wherever possible. All conduit runs may be exposed in mechanical equipment rooms, electrical equipment rooms, electrical closets, and in existing or unfinished spaces. No conduit shall be run exposed in finished areas without the specific approval of the Architect.

4.16 All raceways which are not buried or embedded in concrete shall be supported by straps, clamps, or hangers to provide a rigid installation. Exposed conduit shall be run in straight lines at right angles to or parallel with walls, beams, or columns. In no case shall conduit be supported or fastened to other pipes or installed to prevent the ready removal of other trades piping. Wire shall not be used to support conduit.

4.17 It shall be the responsibility of the Contractor to consult the other trades before installing conduit and boxes. Any conflict between the location of conduit and boxes, piping, duct work, or structural steel supports, shall be adjusted before installation. In general, large pipe mains, waste, drain, and steam lines shall be given priority.

4.18 Conduits above lay-in grid type ceilings shall be installed in such a manner that they do not interfere with the "lift-out" feature of the ceiling system. Conduit runs shall be installed to maintain the following minimum spacing wherever practical.

4.18.1 Water and waste piping not less than 3".

4.18.2 Steam and steam condensate lines not less than 12".

4.18.3 Radiation and reheat lines not less than 6".

4.19 Provide all necessary sleeves and chases required where conduits pass through floors or walls as part of the work of this section. Core drilling will only be permitted where approved by the Architect.

4.20 All empty conduits and surface mounted raceways shall be provided with a ¼" polypropylene plastic pull cord and threaded plastic or metal plugs over the ends.

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Fasten plastic "Dymo" tape label to exposed spare conduit to identify "power" or "communication" system, and to where it goes.

4.21 The ends of all conduits shall be securely plugged, and all boxes temporarily covered to prevent foreign material from entering the conduits during construction. All conduit shall be thoroughly swabbed out with a dry swab to remove moisture and debris before conductors are drawn into place.

4.22 Bending: Changes in direction shall be made by bends in the conduit. These shall be made smooth and even without flattening the pipe or flaking the finish. Bends shall be of as long a radius as possible, and in no case smaller than CEC requirements.

4.22.1 For power conduits for conductors (600v and below), provide minimum 36” radius (vertical) and 72” radius (horizontal) bends.

4.22.2 For power conduits for conductors (greater than 600v), provide minimum 72” radius (vertical) and 72” radius (horizontal) bends.

4.23 Supports: Conduit shall be supported at intervals as required by the California Electrical Code. Where conduits are run individually, they shall be supported by approved conduit straps or beam clamps. Straps shall be secured by means of toggle bolts on hollow masonry, machine screws or bolts on metal surfaces, and wood screws on wood construction. **[No perforated straps or wire hangers of any kind will be permitted. Where individual conduits are routed, or above ceilings, they shall be supported by hanger rods and hangers.]** Conduits installed exposed in damp locations shall be provided with clamp backs under each conduit clamp, to prevent accumulation of moisture around the conduits.

4.24 Where a number of conduits are to be run exposed and parallel, one with another, they shall be grouped and supported by trapeze hangers. Hanger rods shall be fastened to structural steel members with suitable beam clamps or to concrete inserts set flush with surface. A reinforced rod shall be installed through the opening provided in the concrete inserts. Beam clamps shall be suitable for structural members and conditions. Rods shall be galvanized steel 3/8" diameter minimum. Each conduit shall be clamped to the trapeze hanger with conduit clamps.

4.25 All concrete inserts and pipe clamps shall be galvanized. All steel bolts, nuts, washers, and screws shall be galvanized or cadmium plated. Individual hangers, trapeze hangers and rods shall be prime-coated.

4.26 Openings through fire rated floors/walls and/or smoke walls through which conduits pass shall be sealed by Fire stopping material to comply with Division 1 to seal off flame, heat, smoke and fire gases. Sleeves shall be provided for power or communication system cables which are not installed in conduits, and shall be sealed inside and out to comply with manufacturers UL system design details. Where multiple conduits and/or cable tray systems pass thru fire-rated walls at one location, the Contractor shall submit copies of the manufacturers UL system design details proposed for use on this project. All Fire stopping material

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shall have an hourly fire-rating equal to or higher than the fire rating of the floor or wall through which the conduit, cables, or cable trays pass.

4.27 Provide cap or other sealing type fitting on all spare conduits. Conduits stubbed into buildings from underground where cable only extends to equipment, the conduit/cable end shall be sealed to prevent moisture from entering the room or space.

4.28 All conduits which are part of a paralleled feeder or branch circuit shall be installed underground.

4.29 All conduits which are required as a part of systems specified in Divisions 27 or 28, or any other low voltage communication systems, shall be furnished and installed by the Division 26 Contractor.

4.29.1 The Contractor shall coordinate all conduit requirements with each system supplier prior to bid to determine special conduit system requirements.

4.29.2 The Contractor shall provide a pull rope in all conduits for these systems.

4.29.3 The Contractor shall provide conduit sleeves for all open cable installations thru rated walls or block walls. Provide conduit from each building main termination cabinet or backboard to the nearest accessible ceiling for access into all electrical or communications rooms.

4.30 In addition to the above requirements, the following requirements shall apply to all data networking conduits:

4.30.1 Flexible metal conduit may only be used where required at building seismic and/or expansion joints.

4.30.2 All underground conduits shall be provided with minimum 24" radius elbows (vertical) and 60” (horizontal).

4.30.3 No length of conduit above grade shall be installed to exceed 150 feet between pull boxes, or points of connection, unless where specifically detailed on the drawings.

4.30.4 No length of conduit shall be installed to exceed two 90 degree bends between pull boxes, or points of connection, unless where specifically detailed on the drawings.

4.31 Where surface raceways are installed in interior spaces, the Contractor shall take care to route in straight lines at right angles to or parallel with walls, beams, or columns. All raceways and device boxes shall be securely screwed to the finish surface with zinc screw “Auger” anchors Stk #ZSA1K by Gray Bar Electric or equal. Tape adhesive application will not be permitted.

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4.32 The Contractor who installs surface raceway systems shall provide and install complete with wire retention clips, one for every (8) vertical feet or (5) horizontal feet or portion thereof. This Contractor shall also provide each raceway channel with pull strings.

4.33 It shall be the responsibility of the Contractor installing the raceway to coordinate the installation of raceway device plates and inserts with the communications or data contractors.

4.34 MC cable shall be cut using a specific metallic sheath armor stripping tool. The use of hacksaws, dikes or any other tools not specifically designed to remove the armor sheath will not be permitted.

4.35 MC cables installed in attic spaces or above lay-in ceilings shall be installed to be protected from physical damage. The cable shall be mounted along the sides or bottom of joists, rafters or studs.

4.36 Support wires used for supporting ceilings, lighting fixtures or other equipment items shall **not** be used to support MC cables. Conduits, duct work, piping or any other equipment shall not be used to support or mount MC cables.

4.37 MC cable supports, fasteners and clips shall be designed specifically for use with MC cables. Standard conduit supports, fasteners and clips, nails or other items are not permitted for installing MC cables.

END OF SECTION

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SECTION 26 05 34

OUTLET AND JUNCTION BOXES

PART 1 – GENERAL

1.1 Furnish and install electrical wiring boxes as specified and as shown on the electrical drawings.

1.2 Submit manufacturer's data for all items.

1.3 <u>Common submittal mistakes which will result in the submittals being rejected:</u>

1.3.1 Not including all items listed in the above itemized description.

1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.3 Not including actual manufacturer's catalog information of proposed products.

1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

2.1 Boxes shall be as manufactured by Steel City, Appleton, Raco, or approved equal.

2.2 All boxes must conform to the provisions of Article 370 of the CEC. All boxes shall be of the proper size to accommodate the quantity of conductors enclosed in the box. Minimum box size shall be 4" square x 1-½" deep.

2.3 Boxes generally shall be hot dipped galvanized steel with knockouts. Boxes on exterior surfaces or in damp locations shall be corrosion resistant, cast feraloy and shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Boxes shall be Appleton Type FS, Crouse-Hinds, or the approved equal. Conduit bodies shall be corrosion resistant, cast malleable iron. Conduit bodies shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Conduit bodies shall be Appleton Unilets, Crouse-Hinds, or the approved equal. Where recessed, boxes shall have square cut corners.

2.4 Deep boxes shall be used in wall covered by wainscot or paneling and in walls or glazed tile, brick, or other masonry which will not be covered with plaster. Through the wall type boxes shall not be used unless specifically called for. All

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boxes shall be nongangable. Boxes in concrete shall be of a type to allow the placing of conduit without displacing the reinforcing bars. All lighting fixture outlet boxes shall be equipped with the proper fittings to support and attach a light fixture.

2.5 All light, switch, receptacle, and similar outlets shall be provided with approved boxes, suitable for their function. Back boxes shall be furnished and installed as required for the equipment and/or systems under this contract.

2.6 Pull and junction boxes shall be code gauge boxes with screw covers. Boxes shall be rigid under torsional and deflecting forces and shall be provided with angle from framing where required. Boxes shall be 4" square with a blank cover in unfinished areas and with a plaster ring and blank cover in finished areas. Covers for flush mounted oversize boxes shall extend ¾" past boxes all around. Covers for 4" square boxes shall extend ¼" past box all around.

2.7 All terminal cabinets and junction boxes or equipment back boxes which are required as a part of systems specified in Divisions 27 or 28, or any other low voltage communication systems, shall be furnished and installed by the Division 26 Contractor.

2.7.1 The Division 26 Contractor shall coordinate all box requirements with each system supplier prior to bid to determine special cabinet or back box requirements. The Contractor shall also provide stainless steel blank cover plates for all low voltage systems installed for future equipment.

2.7.2 The Contractor shall provide all plywood backboards indicated on walls or inside equipment enclosures. All backboards shall be a minimum of ¾" thick fire rated type plywood.

2.7.3 The Contractor shall coordinate exact rough in locations and requirements with each system supplier.

2.8 In addition to the above requirements, boxes for data networking wiring and equipment shall comply with the following:

2.8.1 All boxes shall be a minimum of 4-11/16" square x 2-1/8" deep.

2.8.2 Where pull boxes are required on individual conduits 1-¼" or smaller, provide 4-11/16" square x 2-1/8" deep boxes. Where pull boxes are required on conduits larger than 1-¼" for straight pull through, provide eight times the conduit trade size for box length. Where pull boxes are required on conduits larger than 1-¼" for an angle or a U-pull through installation, provide a minimum distance of six times the conduit trade size between the entering and exiting conduit run for each cable.

2.9 Recessed boxes installed in fire rated floors/walls and /or smoke walls shall be sealed by Fire stopping material to comply with Division 1 to seal off flame, heat, smoke and fire gases. The Contractor shall submit copies of the manufacturers UL system design details proposed for use on this project. All Fire stopping

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material shall have an hourly fire-rating equal to or higher than the fire rating of the floor or wall through which the conduit, cables, or cable trays pass.

PART 3 – EXECUTION

3.1 Boxes shall be installed where required to pull cable or wire, but in finished areas only by approval of the Architect. Boxes shall be rigidly attached to the structure, independent of any conduit support. Boxes shall have their covers accessible. Covers shall be fastened to boxes with machine screws to ensure continuous contact all around. Covers for surface mounted boxes shall line up evenly with the edges of the boxes.

3.2 Outlets are only approximately located on the plans and great care must be used in the actual location of the outlets by consulting the various detailed drawings and specifications. Outlets shall be flush with finished wall or ceiling, boxes installed symmetrically on such trim or fixture. Refer to drawings for location and orientation of all outlet boxes.

3.3 Furnish and install all plaster rings as may be required. Plaster rings shall be installed on all boxes where the boxes are recessed. Plaster rings shall be of a depth to reach the finished surface. Where required, extension rings shall be installed so that the plaster ring is flush with the finished surface.

3.4 All cabinets and boxes shall be secured by means of toggle bolts on hollow masonry; expansion shields and machine screws or standard precast inserts on concrete or solid masonry; machine screws or bolts on metal surfaces and wood screws on wood construction. All wall and ceiling mounted outlet boxes shall be supported by bar supports extending from the studs or channels on either side of the box. Boxes mounted on drywall or plaster shall be secured to wall studs or adequate internal structure.

3.5 Boxes with unused punched-out openings shall have the openings filled with factory-made knockout seals.

3.6 Where standby power and normal power are to be located in the same outlet box or 480V in a switch box, install partition barriers to separate the various systems.

3.7 All outlet boxes and junction boxes for fire alarm system shall be painted red.

END OF SECTION

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SECTION 26 24 16

PANEL BOARDS

PART 1 – GENERAL

1.1 Furnish and install branch circuit panel boards as specified herein and as indicated on the drawings. Submit manufacturers' data on all items.

1.2 Submit manufacturers' data on all panel boards and components including:

1.2.1 Enclosures and covers

1.2.2 Breakers

1.2.3 Surge Protective Device (SPD) equipment

1.2.4 Incident energy level calculations

1.2.5 Common submittal mistakes which will result in the submittals being rejected:

1.2.5.1 Not arranging the circuit breakers in panels to match the orientations indicated on the drawings. In other words, if a 30 amp breaker is shown on the drawing in Space #2, this must be the location it appears on the submittal schedule. Standard factory arrangements will not be accepted.

1.2.5.2 Not including all items listed in the above itemized description.

1.2.5.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.2.5.4 Not including actual manufacturer's catalog information of proposed products.

1.2.5.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

2.1 The interrupting rating of circuit breakers shall be 10,000 amps for the 120/208 system and 14,000 amp for 277/480 volt systems. Refer to drawings for higher interrupting rating requirements. All components and equipment enclosures shall be manufactured by the same manufacturer. Circuit breakers shall be permitted to be series rated to limit the available fault current to no more than the above ratings.

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2.2 All panels shall be fully bussed. Recessed panel enclosures shall be a maximum of 20" wide and 5-3/4" deep for all panels 600 amp rated and less.

2.3 All busses shall be tin-plated aluminum and shall be located in the rear of the panelboard cabinet. Individual circuit breakers shall be bolt on type and removable from the cabinet without disturbing the bussing in any way. All panel boards shall contain ground busses.

2.4 Panel covers shall be door in door style, with one lock. Door lock shall allow access to breakers only. Access to wireways without removal of cover shall be permitted by (non removable) screws behind the locked door. Panel cover shall be provided with full length piano hinge. All locks for all panels provided in this project shall be keyed alike.

2.5 Each panel shall have a two-column circuit index card set under glass or glass equivalent on the inside of the door. Each circuit shall be identified as to use and room or area. Areas shall be designated by room numbers. Room numbers shown on the drawings may change and contractor shall verify final room numbers with the architect prior to project completion.

2.6 Tandem mounted or wafer type breakers are not acceptable.

2.7 Multiple breakers shall have one common trip handle or be internally connected. Handle ties are not acceptable.

2.8 Breaker arrangements shown in the drawings shall be maintained. The circuit breakers in panels must match the orientations indicated on the drawings. In other words, if a 30 amp breaker is shown on the drawing in Space #2, this must be the location it appears on the submittal schedule. Standard factory arrangements will not be accepted.

2.9 Where conductor sizes exceed the standard breaker lug wire range, or where multiple conductors per phase are required, the panelboard manufacturer shall provide the breaker with suitable lugs for terminating the specified conductors.

2.10 Acceptable manufacturers are Square D, Eaton, Siemens or General Electric.

2.11 Equipment manufactured by any other manufacturers not specifically listed in Section 2.10 are <u>not</u> considered equal, or approved for use on this project.

Surge Protective Devise (SPD)

2.12 Surge Protective Device (SPD) panelboards, shall be provided with an integrated circuit breaker panelboard and parallel connected suppression / filter system in a single enclosure. The SPD panelboard shall meet the following parameters: IEEE C62.41.1, IEEE C62.41.2, IEEE C62.45, UL 1283 and the UL 1449, Third Edition, effective September 29, 2009.

2.13 The panelboard shall be UL 67 Listed and the SPD shall be UL 1449 labeled as Type 1 or Type 2 or as Type 4 intended for Type 1 or Type 2 applications. SPD shall be factory installed integral to the panel board.

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2.14 The SPD panelboard shall be top or bottom feed according to requirements. A circuit directory shall be located inside the door.

2.15 SPD shall meet or exceed the following criteria:

2.15.1 For standard areas supply SPD having 100kA per phase surge current capacity. For mountain and desert areas (areas with over 5 lightning strikes per year), SPD shall have a per phase surge current capacity of 200kA.

2.15.2 UL 1449 – Third Edition Revision; effective September 29, 2009, Voltage Protection Ratings shall not exceed the following:

VOLTAGE	L-N	L-G	N-G	L-L	MCOV
208Y/120	700V	700V	700V	1200V	150V
480Y/277	1200V	1200V	1200V	2000V	320V

2.15.3 SPD shall be UL labeled with 100kA Short Circuit Current Rating (SCCR).

2.16 UL 1449 - Third Edition Revision; effective September 29, 2009, Voltage Protection Ratings shall not exceed the following:

VOLTAGE	L-N	L-G	N-G	L-L	MCOV
208Y/120	700V	700V	700V	1200V	150V
480Y/277	1200V	1200V	1200V	2000V	320V

2.17 SPD shall be UL labeled with a minimum 100kVA short circuit rated (SCCR).

2.18 UL 1449 Listed Maximum Continuous Operating Voltage (MCOV) (verifiable at UL.com):

System Voltage	Allowable System Voltage Fluctuation (%)	MCOV
208Y/120	25%	150V
480Y/277	15%	320V

2.19 SPD shall incorporate a UL 1283 listed EMI/RFI filter with minimum attenuation of - 50dB at 100 kHz. No filtering is required for a 100kA SPD.

2.20 Suppression components shall be heavy duty ‘large block’ MOVs, each exceeding 30mm diameter.

2.21 Type 4 SPD shall include a serviceable, replaceable module.

2.22 SPD shall be equipped with the following diagnostics:

2.22.1 Visual LED diagnostics including a minimum of one green LED indicator per phase, and one red service LED.

2.22.2 No other test equipment shall be required for SPD monitoring or testing before or after installation.

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2.23 SPD shall have a response time no greater than 1/2 nanosecond

2.24 SPD shall have a 10 year warranty

2.25 The SPD panelboard shall have removable interior

2.26 The SPD panelboard main bus shall be aluminum and rated for the load current required

2.27 The SPD panelboard shall include a 200% rated neutral assembly with copper neutral bus

2.28 The unit shall be provided with a safety ground bus

(SPD) Quality Assurance

2.29 Manufacturer Qualifications: Engage a firm with at least 5 years experience in manufacturing transient voltage surge suppressors.

2.30 Manufacturer shall be ISO 9001 or 9002 certified.

2.31 The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of ten (10) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

2.32 The SPD shall be compliant with the Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC.

PART 3 – EXECUTION

3.1 Painting of panelboard covers in finished areas shall be done by the general contractor.

3.2 Provide a spare 3/4" conduit stubbed to an accessible area for each of every three (3) spares or spaces provided in recessed panel boards.

3.3 All lugs shall be torque tested in the presence of the inspector of record.

Arc Flash and Shock Hazard

3.4 The Contractor is to provide, and submit to the engineer for approval, incident energy level calculations as determined using the methodologies described in NFPA 70E or IEEE standard 1584-2002.

3.4.1 **All studies shall be performed by "Emerson Electric" (858) 695-9551, MTA (858) 472-0193, or Terra Power Solutions (858) 380-8170. Studies performed by manufactures or other engineering or testing companies must submit qualifications for approval by Johnson Consulting Engineers, 7 days prior to bid for this project**.

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3.5 A warning label, as specified in the above standard, shall be placed on each switchboard, panelboard, and safety switch indicating the incident energy levels on the equipment to warn qualified personnel in accordance with NFPA 70E, section 110.16 Labels shall be laminated white micarta with black lettering on each. Letters shall be no less than 3/8" high.

3.6 The incident level calculations for each piece of equipment shall be given to the owner and maintained on file by the maintenance department

3.7 The design goal is to minimize the incident energy to which a maintenance employee may be exposed.

END OF SECTION

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SECTION 26 27 26

SWITCHES AND RECEPTACLES

PART 1 – GENERAL

1.1 Furnish and install all wiring devices as shown on drawings and as herein specified. Unless otherwise noted, device and plate numbers shown are Hubbell and shall be considered the minimum standard acceptable. Other acceptable manufacturers are Pass and Seymour, Leviton, General Electric and Bryant.

1.2 Submit manufacturers' data on all items.

1.3 **Common submittal mistakes which will result in the submittals being rejected:**

1.3.1 Not correctly indicating ampacity rating of proposed devices.

1.3.2 Not including all items listed in the above itemized description.

1.3.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.3.4 Not including actual manufacturer's catalog information of proposed products.

1.3.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

2.1 All switches shall be of the quiet mechanical type, Specification Grade, 20 amp, 120/277 volt AC as follows:

	HUBBELL	LEVITON	PASS & SEYMOUR
Single Pole	CS120	CS1202	CS20AC1
Two Pole	CS1222	CS2202	CSB20AC2
Three-way	CS320	CS3202	CS20AC3
Key Switch	HBL1221L	1221-2L	PS20AC1-L

2.2 All switches shall have the "on" and the "off" position indicated on the handle. If switches of higher ampere ratings are required, they shall be of similar type and quality as those shown above. Groups of switches shown at one location shall be installed under a single plate up to a maximum of six where more than six switches are shown coordinate arrangement with the Architect.

2.3 Dimmer switches for incandescent lamp loads shall be square-law type, slide control dimmer with OFF position, Lutron or Hubbell "Nova-T" Series NT-600 (0-

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500 watt load), NT-1000 (501-900 watt load), NT-1500 (901-1500 watt load), or equal (no known equal).

2.4 All convenience receptacles and special outlets throughout shall be grounding type. Convenience receptacles shall be side wired, parallel slot, two pole, three wire, 20 amp as follows:

	HUBBELL	LEVITON	PASS & SEYMOUR
Duplex	5352	5362	PS5362
GFCI	GFR5352A	8899	2094
Isolated Ground	IG5362	5362IG	IG6300
Tamper Proof		8300SG	TR63H

2.5 All safety or tamper proof receptacles shall have no exposed external current carrying metal parts, and shall have integral wiring leads suitable for two or three wire installations.

2.6 Special receptacles shall be as noted on the drawings.

2.7 Weatherproof plates shall be designed to meet CEC Article 410-57, wet location listed with cover "open." Where weatherproof receptacles have been identified to be provided with locking covers, the cover shall be as manufactured by Pass & Seymour #4600-8 or Cole Lighting 310 Series. Rough-in requirements vary between manufacturers. Contractor to field verify requirements prior to installation.

2.8 All plates throughout shall be stainless steel. Where wiring devices are installed in concrete block walls, provide oversized 3-1/2" x 5" coverplates.

2.9 All devices shall be white unless otherwise noted or a special purpose outlet.

2.10 Unless where specifically detailed on the drawings, floor boxes shall be PVC suitable for concrete poured floors of minimum 3-1/2" depth, with a modular design to gang two or three sections together.

2.10.1 Carlon #E976 series or approved equal

2.10.2 Provide brass cover with brass carpet flange unless otherwise detailed.

PART 3 – EXECUTION

3.1 Switches for room lighting shall be located no more than 12" center line from door jamb at plus 48" center line above finished floor or +46" to top of devices where located over casework, reference CBC Figure 11B-5D.

3.2 All receptacles shall be mounted at plus 18" to center line above finished floor unless noted or shown otherwise. All receptacles shall be installed with the ground pin up, at the top of the receptacle to comply with IEEE 602-1986.

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3.3 Furnish and install wall plates for all wiring devices, and outlet boxes, including special outlets, sound, communication, signal, and telephone outlets, etc. as required. All cover plates shall be appropriate for type of device.

END OF SECTION

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SECTION 26 90 90

TESTING

PART 1 – GENERAL

1.1 Upon completion of the electrical work, the entire installation shall be tested by the Contractor, and demonstrated to be operating satisfactorily to the Architect, Engineer, Inspector and Owner.

1.2 All testing and corrections shall be made prior to demonstration of operation to the Architect, Engineer, Inspector and Owner.

1.3 In addition to the demonstration of operation, the Contractor is also required to review the content and quality of instructions provided on items demonstrated with the Architect, Engineer, Inspector and Owner.

PART 2 – EXECUTION

2.1 Wiring shall be tested for continuity, short circuits and/or accidental grounds. All systems shall be entirely free from “grounds,” “short circuits,” and any or all defects.

2.2 Motors shall be operating in proper rotations, and control devices functioning properly. Check all motor controllers to determine that properly sized overload devices are installed, and all other electrical equipment for proper operation.

2.3 Tests and adjustments shall be made prior to acceptance of the electrical installation by the Architect, and a certificate of inspection and acceptance of the electrical installation by local inspection authorities shall be provided.

2.4 All equipment or wiring provided which tests prove to be defective or operating improperly shall be corrected or replaced promptly, at no additional cost to the Owner.

2.5 Test all motor and feeder circuits with a “megger” tester to determine that insulation values conform to Section 110-20, California Electrical Code (CED). Test reports must be submitted and approved by the engineer before final acceptance.

2.6 Test all grounding electrode connections to assure a resistance of no more than 10 ohms is achieved. Augment grounding until the ohmic value stated above is achieved. Provide certified test results to the Architect, Engineer and Inspector.

END OF SECTION

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SECTION 27 01 00

COMMUNICATIONS GENERAL PROVISIONS

ARTICLE 1 - SUMMARY

1.1 This Division of the specifications outlines the provisions of the contract work to be performed as a sub contract under the Division 26 scope of work. Reference the Division 26 Electrical General Provisions for scope of work and general requirements.

1.2 In addition, work in this Division is governed by the provisions of the bidding requirements, contract forms, general conditions and all sections under Division 1 requirements.

END OF SECTION

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SECTION 27 10 00

VOICE / DATA INFRASTRUCTURE

PART 1 – GENERAL

1.1 Include all labor, equipment and materials necessary for providing a complete networking infrastructure system as described herein and/or as indicated on the drawings.

1.2 Related specification sections:

1.2.1 Section 26 01 00 - General Provisions.
1.2.2 Section 26 05 33 - Conduit and Fittings.
1.2.3 Section 26 05 19 - Conductors.
1.2.4 Section 26 05 34 – Outlet and Junction Boxes.

1.3 Approved products and all components shall be manufactured by one of the approved manufactures, and the installing contractor must have the accompanying certification from the product manufacturer for installation of a "Warranted System: as required by each manufacturer and as indicated in these specifications. The **Acceptable manufacturers are**:

1.3.1 **Leviton / Berk-Tek**

1.3.1.1 Installing contractor must be **LEVITON CCS LEVEL III** certified to install this system.

1.3.1.2 No other system components shall be permitted. Existing system with new components to match. (No Approved Equal)

1.3.2 Systems or components as manufactured by Hitachi or any other manufacturer's which are not specifically listed, are **not** approved for use on this project. Specified system warranties are to be established between the component manufacturers and the owner, warranties between the cable manufacturer or installing contractor and the owner are not considered equal.

1.3.3 Installing contractor qualifications: Firms and their personnel must be regularly engaged in the installation of data networking cabling and equipment for systems of similar type and scope. The contractor must have a full service office able to respond to emergency callouts during the warranty period. The contractor must also provide complete installation of all wiring and devices or equipment. Subcontracts with Division 26 contractors or other warranted or non-warranted contractors for supervised installation of any part of this system is not approved. All conduit and standard back boxes will be furnished and installed by the Division 26 contractor. Specialty boxes will be furnished by the equipment supplier and installed by the Division 26 contractor.

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1.3.4 Equipment qualifications: It is the intent of these specifications that each bidder provide all hardware, components and installation services that are necessary to ensure a fully operational Augmented Category-6 wiring system including warranties, proposed in the EIA/TIA Augmented Category-6 and the ISO drafts.

1.3.5 **Warranty shall be a full "Performance Warranty" installed by a "Certified Contractor" as specified by one of the approved manufacturer's A "Component Warranty" will not be considered equal.** All components, labor, and 'Link Performance Criteria" shall be warranted by one of the approved manufacturers. Warranty shall be to the customer for 15-years (some warranty programs may be greater, this is a minimum requirement) after Customer acceptance and sign-off of the completed system. **The contractor must provide documentation from one of the approved manufacturers indicating their qualifications for installation of this system in compliance with the manufacturers warranty requirements as a warranted contractor.**

1.4 In order to ensure project cohesion, a single point of contact is required to provide a "TURNKEY" solution. The work covered under this section of the specification consists of furnishing all labor; cabling; equipment; supplies; materials, and training. The Contractor will perform all operations necessary for the "TURNKEY" and fully completed installation in accordance with the specifications herein. As such, the successful contractor must be factory trained on all aspects of system hardware. The successful Contractor shall be a California licensed C7 or C10 premise wiring contractor as defined in this specification. Subcontractors may not be utilized in the implementation of the plant wiring installation or certification process. The contractor shall provide a licensed, qualified Division 26 contractor for installation of all conduits, outlet and junction boxes, trenching and pull box installations.

1.5 The drawings indicate a schematic routing of cables above ceilings. The Contractor shall field-verify the most appropriate routing of all above-ceiling cable prior to bid. Where cables penetrate through walls a conduit sleeve shall be provided. **Where cables pass through fire rated walls, the conduit sleeve shall be sealed to maintain the rating of the wall assembly.**

1.6 Phase I Submittal shall be made **within (20) working days** after the award of the contract by the District. This submittal shall include the following:

1.6.1 Complete bills of quantities, including all materials, components, devices, and equipment required for this work. The bills of quantities shall be tabulated respective of each and every system as specified, and shall contain the following information for each Section listed:

1.6.1.1 Description and quantity of each item.
1.6.1.2 Manufacturer's Name and Model Number.
1.6.1.3 Manufacturer's Specification Sheet.

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1.6.2 Include with submittals all warranty information and a description of support and maintenance services to be provided. Also include all licenses and maintenance agreements required for continued operation of the equipment.

1.7 Phase II submittal shall be provided **within (20) working days** after the approval of the Phase I submittals and prior to any fabrication or field conduit installations. All shop drawings shall be engineered and drawn on a CAD System. Each submission shall include 'D' or 'E' size print copies to match the contract drawings, and (1) Phase II submittals drawings shall include the following.

1.7.1 MDF or IDF equipment ~~or~~ rack elevations will be required to be provided including, cable routing and position of all components.

1.7.2 Provide labeling plan which identifies the proposed scheme for identifying all components including Racks, patch panels (fiber and copper), ports and cables (fiber and copper).

1.8 **Common submittal mistakes which will result in submittals being rejected:**

1.8.1 Not including the qualifications of the installing contractor.

1.8.2 Not including all items listed in the above itemized description.

1.8.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.

1.8.4 Not including actual manufacturer's catalog information of proposed products.

1.8.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

1.9 The contractor shall make a ***written*** request directly to Johnson Consulting Engineers for electronic drawing files. As a part of the written request, please include the following information:

1.9.1 Clearly indicate each drawing sheet needed (i.e., E1.1, E2.1, etc.).

1.9.2 Identify the name, phone number, mailing address and e-mail address of the person to receive the files.

1.9.3 Provide written confirmation and agreement with the requirements described for payment of computer files, as described below.

1.9.4 Detail or riser diagram sheets, or any other drawings other than floor plans or site plans, ***will not be made available to the contractor.***

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1.9.5 Files will only be provided in the AutoCAD format in which they were created (i.e., version 14 or version 2000i).

1.9.6 Requests for files will be processed as soon as possible; a minimum of 7 working days should be the normal processing time. The contractor shall be completely responsible for requesting the files in time for their use.

1.9.7 CAD files will be made available via e-mail or on disk, depending on the quantity of files requested. The contractor requesting the files will be required to pay $50.00 per drawing plan, or $300.00 maximum, whichever is ***less***.

PART 2 - PRODUCTS

2.1 Equipment racks in the IDF closet are existing.

Intermediate Distribution Frame (IDF is existing)

2.2 The Intermediate Distribution Frame shall be a secondary wiring and equipment location for the voice/data networking system. The Contractor shall include the following items at this location.

2.2.1 Augmented Category-6A Modular Patch Panel (rack mounted) with RJ45 style connectors, for terminating all twisted pair cable from each voice/data outlet served from this location. Provide 25% spare capacity for future wiring requirements. All patch panels shall be 48 port capacity. Provide cable support bars at the rear of each patch panel. Patch panels shall be Leviton Angled CAT 6A, Model #6A587-U48. (No approved equal)

2.2.2 Horizontal wire managers are not required between each of the data patch panels. Patch cords shall be routed through the vertical wire management.

2.2.3 Provide (black) Augmented Category-6A (patch panel end) patch cords with pre-molded boot, provide quantity equal to 100% of the total voice/data cable drops provided. Verify with Customer all ports which will be activated. All patch cords to be installed by Contractor. Allow for 15% of total copper patch cords required to be (7) feet in length, and the remainder to be (5) feet in length. Patch cords shall be in compliance with the manufacturer's "Channel" warranty requirements. Provide Leviton Atlas-X1 Cat 6A SlimLine Patch Cords – Black Color, 6AS10-05E (5 ft. length) or 6AS10-07E (7 ft. length) Black color.

2.2.4 Provide (blue) Augmented Category-6A (workstation end) patch cords with pre-molded boot, provide quantity equal to 100% of the total voice/data cable drops provided. Verify with Customer all ports which will be activated. All patch cords to be installed by Contractor. All of total copper patch cords required to be (15) feet in length. Patch cords shall be in compliance with the manufacturer's "Channel" warranty

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requirements. Provide Leviton Atlas-X1 Cat 6A SlimLine Patch Cords – Blue Color, 6AS10-15L (15 ft. length) Blue color.

2.2.4.1 Provide all other items as detailed on the drawings.

2.3 **Voice/Data Station Cable**

2.3.1 Provide one Augmented Category-6A, 4-pair, unshielded twisted pair (UTP) cable from the nearest MDF or IDF to each RJ45 data outlet port indicated on the drawings. Dual port outlets will require two such cables. Four port outlets will require four cables, etc.

2.3.2 Augmented Category 6A cables shall be copper wire, individually insulated and color coded.

2.3.3 The cables shall be UL or ETL rated and UL verified in compliance with Augmented Category-6A requirements.

2.3.4 The cables shall be UL or ETL rated and UL verified in compliance with proposed Augmented Category-6A.

Berk-Tek – CAT 6A LANmark-XTP Cable, Blue, #11082062 (Riser Rated Reel)

2.3.5 (No Approved Equal) Cable shall match the existing system components.

2.4 **Voice/Data Outlets**

2.4.1 Unshielded twisted pair data outlets shall be an RJ45 Enhanced performance type 8-position/8 conductor modular jacks, and shall comply with Augmented Category-6 performance requirements, single port, dual port or quantities of ports as noted on drawings. All outlets shall be wired in an EIA/TIA 568B configuration.

2.4.2 All faceplates shall be the angled style with label windows. Provide Leviton Faceplate Part #42081-4XS (X = Color). Contractor shall be responsible for confirming color of faceplates prior to ordering. All faceplates shall be a minimum of four ports. Provide blanks for all unused ports.

2.4.3 All voice/data outlets shall be blue in color. Provide Insert # 6AUJK-RL6 for all voice/data connections, as manufactured by Leviton Atlas-X1 Cat-6A Component-Rated QuickPort Connector.

2.4.4 For single port voice outlet locations intended for wall telephone connections, a wall telephone type faceplate with attachment studs shall be provided. The wall telephone jack shall be 8-pin, RJ45 type and Leviton QuickPort inserts only. Provide Leviton Model #4108W-1SP stand-alone wallphone adapter plate. (No Approved Equal) Screw terminal type jacks will not be accepted as an alternative.

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2.4.5 Colored inserts are required for this project. Confirm colors with College IS Department for the exact color scheme to be provided prior to ordering the materials. Inserts submitted that do not follow the color and identification requirements will be rejected. Inserts installed that do not follow the color coding as required by the College IS Department will be replaced at the Contractor's expense.

2.4.6 All labels will be installed under label windows. Labels adhered to the surface of the faceplate will not be accepted.

2.4.7 Reference the drawings for special outlet configurations or plate requirements.

2.5 Wireless Access Points

2.5.1 Per College IS Department, all wireless access point locations shall be provided with Oberon Model 1046-CCAP3800 for suspended ceiling locations, Model #1040-CCAP3800 for Cloud or Canopy ceiling locations or 1006-CCAP3800 for wall mounted applications. Provide the type of mount that complies with the type of ceiling in the area of work. Field verify requirements prior to ordering the mounts.

PART 3 - INSTALLATION

3.1 **Upon completion of 10% of the cabling installation, the contractor shall notify the engineer for an inspection of the methods and types of materials used on the project. The contractor shall give a minimum of 72 hours notification to the engineer for the inspection. The contractor will be given a written review of the findings, so if adjustments are required, they can be done before the project proceeds.**

3.2 **Pull strings will be provided with all cable runs including but not limited to; conduit stub ups, conduit sleeves, cable trays, open wiring routes, innerduct, and point-to-point conduits. Pull strings shall be free from cable bundles in open wiring routes.** Pull strings shall not be substituted for pull ropes.

3.3 Velcro cable management straps are required on all Augmented Category-6 cable bundles, the last 20 feet or upon entry into equipment closet, a maximum of 12" apart. Cable bundles shall also be routed through cable management or "D" rings in the equipment closet.

3.4 Data contractor shall supply protective bushings or slide on rings at the ends of all exposed conduits used for the data system cabling. This is to include all conduits installed for any future data cabling requirements. Contractor shall submit planned protection bushing prior to installation of cabling for approval.

3.5 Velcro cable management straps are required on the rear of the equipment racks and on the patch cords within the vertical cable managers. Straps shall be a maximum of 12" apart.

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3.6 Labeling

3.6.1 All labeling and labeling schemes must be approved by the College IS Department prior to installation and must follow District Standards. Contractor shall coordinate with the IS Department for labeling requirements. Each cable run shall be permanently labeled at each end with a unique sequential number which corresponds to a similar number provided for each data outlet and punch down point. A printed label shall be placed at each of the following locations;

3.6.1.1 On the cable at the rear of the patch panel or termination block. Requires the use of a self-laminating wrap around label. Brady Label self-laminating 1.2" by 1.5" wrap around label Part # 29689. NO APPROVED EQUAL.

3.6.1.2 On each cable in the j-box behind the faceplate location. Requires the use of a self-laminating wrap around label. Brady Label self-laminating 1.2" by 1.5" wrap around label Part # 29689. NO APPROVED EQUAL.

3.6.1.3 On the face of the patch panel, provide a 3/4" by 3/4" label with a letter or number identifying the patch panel designation.

3.6.1.4 On the face of the faceplate in the label holder window.

3.6.2 Hand written labels are not permitted. Where cable ID includes room number identification the Contractor shall obtain written verification of actual room numbers prior to beginning labeling (numbers on plans do not always match actual room numbers). Cable pulling cross reference lists will not be accepted with final documentation.

3.6.3 Each patch panel port shall be identified with a unique sequential labeling scheme. Port identification labeling pattern shall be consistent throughout the project.

3.6.4 All faceplates shall be identified with permanent printed labels. Labels must not be subject to removal by incidental contact. Contractor shall be responsible for replacing defective labeling for a period of one year from date of final sign-off of project.

3.6.5 Labeling will follow recommended EIA/TIA standards or as requested by the customer. Contractor will confirm labeling pattern prior to final identification or testing. All test results will be identified by the final labeling scheme.

3.6.6 Special Note; Contractor shall re-label the existing Category-6 patch panels that are being re-located to the new equipment rack. The labeling requirements shall be defined by the College IS Department. Contractor shall coordinate with the College IS Department to determine the proper configuration of the labeling.

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3.7 Demolition of existing UTP cable plant

3.7.1 Contractor shall remove all existing Category-3 and Category-5 UTP cables currently installed to the IDF room and routed to the area of the offices that are scheduled to be remodeled. Refer to the floor plans for the exact areas that are included in the project scope.

3.7.2 Remove the old patch panels from the existing equipment racks and remove all cables and debris from the patch panels. Pack the old patch panels in boxes and deliver the old patch panels to the College IS Department.

3.7.3 Remove all old cable and faceplates from the ceilings, floor ducts and walls and provide blank faceplates for the unused junction boxes. Some of the existing junction boxes and raceway will be re-used for the new Augmented Category-6 cabling. Remove all old cables from all locations in the project scope areas.

3.7.4 Remove the existing patch cords that are currently servicing the patch panels that are to be removed and pack the patch cords in boxes. Deliver the patch cables to the College IS Department.

3.7.5 Coordinate with the College IS Department for delivery options and receipt of old materials.

3.8 Where open wiring cables are run through the ceiling space (only permitted where specifically noted on the drawings), the wire shall be bundled together and supported above the ceiling.

3.9 All cables must be fastened to the building structure via “j-hooks” or an approved Category 6 suspension system, and not directly in contact with ceiling system. For “j-hooks” maximum fill capacity is as follows: 1-5/16" hooks – 35 cables; 2" hooks - 60 cables; 4" hooks - 120 cables. For quantities beyond 120 cables use a sling support system such as “Erico Cable Cat” or equal. Maximum fill capacity 200 cables. **D-rings, “Caddy #WMX cable hangar”, “Caddy Bridle Rings”, drive rings or any other type of wire ring support is not allowed.**

3.10 Where cables pass through a fire-resistant portion of the structure, conduit sleeves shall be provided to maintain the rating of the wall penetrated. Sealing of all penetrations with an approved fire barrier is required. Conduits and sleeves must remain accessible for future use. Permanent sealants may not be used to seal sleeves and conduits.

3.11 **Provide 6 inches of cable slack at computer data system outlets inside conduit box.**

3.12 In an accessible ceiling area, **provide a 10-foot (circle 8 configuration) service loop above the data/voice outlet** locations. Service loop must be tied up off of ceiling tiles or ceiling surface. Neatly coil cable without exceeding minimum bend

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radius limitations. **Do not provide length in excess of 15 feet. May cause improper test results.**

3.13 The minimum bending radius for all cables and the maximum pulling tension shall not exceed manufacturer's recommendations.

3.14 Cables installed in pullboxes on terminal backboards shall be installed on wall mounted cable support racks.

3.15 Provide a full 360-degree loop of cable around manhole and pullbox interiors.

3.16 Cable pulling shall use a split mesh grip over the cable jacket. Connection directly to optical fibers and copper wire conductors shall not occur.

3.17 When pulled through conduits, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the manufacturer.

3.18 Where cables are pulled through or pulled from a center of run, pull without splices or terminations, lead out the cables at all manholes, pullboxes, and conduits, taking care to feed them in again by hand for the next run.

3.19 For each cable pull where a cable direction change is required, flexible feed-in tubes, pullout devices, multi-segmented sheaves, etc., shall be used to ensure proper cable pulling tensions and side wall pressures. Cables shall not be pulled directly around a short right angle bend. Any device or surface the cable comes in contact with when under pull-in tension shall have a minimum radius 50% greater than the final specified minimum installed cable bending radius. The maximum possible size radius sheaves and feed-in tubes, usable in the available working space, shall be provided in all situations, to ensure the minimum possible cable sidewall pulling pressure. Do not use devices with multi-segment "roller" type sheaves.

3.20 Cable lengths over 250 feet shall be machine pulled, not hand pulled. Cables shall be pulled in a continuous, smooth operation without jerking or stop-start motion after initiation of pull. Maximum cable pulling speed shall be less than 50 feet per minute. Minimum pulling speed shall be greater than 15 feet per minute.

3.21 When pulling cable through conduit, cables shall be pulled straight into or out of the raceway without bends at the raceway entrance or exit. Pull in cable from the end having the sharpest bend (i.e., bend shall be closest to the reel.) Keep pulling tension to minimum by liberal use of lubricant, hand turning of reel, and slack feeding of cable into duct entrance. Employ not less than one man at reel and one at manhole or pullbox during this operation. Cables shall be pulled directly from cable reels.

3.22 All cables shall be new and extend continuous from each MDF or IDF backboard or rack to all voice/data outlets or other equipment locations.

3.23 Where cables are not installed in a conduit or other raceway system, they shall not be routed parallel with other line voltage equipment or wiring (120 volt and above) within 36" or within 12" of line voltage equipment or wiring where

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crossing. Where Flooded Enhanced Category-5 cables or outdoor rated fiber optic cables are routed exposed through ceilings for more than 50'-0", install in innerduct or EMT conduit system.

PART 4 - TESTING

4.1 All Augmented Category-6 cables shall be point to point (permanent link) tested after installation/termination, and verified to operate at minimum 1 Gbps. Performance of installed cables shall satisfy all current addendums to the EIA/TIA 568B standard for Augmented Category-6 wiring. In addition, testing shall satisfy all amendments to the existing ISO/IEC requirements. The wiring shall support all specified communication protocols. Testing shall support the Augmented Category-6 requirements by the EIA/TIA.

4.2 Upon completion of testing cable links, the Contractor shall supply a copy of the original database files downloaded from the tester in original format on disk. Contractor shall provide with database files an original copy of the tester's manufacturer software program (included in original cost) for record management and archiving, in a Windows format (e.g., MicroTest's software program - ScanLink ver.

4.2.1 10 PC for Windows, WaveTek's software program-LTRM ver.1.07, etc). The manufacturer's software program will be used by the engineer to review all test results, and then turned over to the customer to keep as their record copy with the final approved test results. Provide (3) copies of tests on disk.

4.3 Contractor will repair or replace cable runs or connecting hardware that do not meet specified criteria.

4.4 Test procedures shall comply with ANSI/EIA/TIA 528B.2-10. Test results shall meet the minimum following criteria:

4.4.1 Test all voice/data cables minimum Augmented Category-6 UTP cable to test results for "Permanent Link Testing" requirements @ 250 Mhz per current ANSI/EIA/TIA requirements and all current addendums. Any cables which do not meet these minimum requirements shall be replaced or repaired at no cost to the customer.

4.4.1.1 **Cable Tester must be set to show exact cable parameters including the cable part number associated with the manufacturer. Generic cable testing will not be accepted and all possible tests must be performed and reflected in the database file submittal.**

4.4.2 Patch cables must be Certified Augmented Category-6 from Leviton and must match installed cable base.

4.4.3 All copper testing must address "Alien Crosstalk" parameters and tester must be updated with the latest software. A full test must be performed on

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all UTP cables installed per the current adopted standards and all adopted drafts.

4.5 Provide (3) hard bound copies of “E-size” drawings and (1) electronic copy in AutoCAD 2010 format or later version on either USB drive or DVD disk, of the floor plan drawings of each building or area of work. Contractor shall deliver a copy of the as-built drawings on to the College IS Department Project Manager. These drawings shall include all outlet locations, major cable routes and outlet and cable identification numbers. Provide detailed elevations of each MDF or IDF locating all equipment and connections showing all of the existing and new work completed for the project.

END OF SECTION

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