

# PROJECT MANUAL

for

## Serna Center Lobby Security Upgrade

at

5735 47<sup>th</sup> Avenue  
Sacramento, California 95824

And

## Central Enrollment Lobby Security Upgrade

at

5601 47<sup>th</sup> Avenue  
Sacramento, California 95824

SACRAMENTO CITY UNIFIED SCHOOL DISTRICT  
Sacramento, California

Prepared by:

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NLA Project No. Y2244.00

## Bid Package

April 23, 2024

PROJECT MANUAL AND SPECIFICATIONS  
FOR  
SACRAMENTO CITY UNIFIED SCHOOL DISTRICT

Serna Center and Central Enrollment  
Lobby Security Upgrades  
DSA Application No. n/a

SIGNATURE PAGE

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PROJECT MANUAL AND SPECIFICATIONS  
FOR  
**SACRAMENTO CITY UNIFIED SCHOOL DISTRICT  
SERNA CENTER**

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**MINOR DEMOLITION FOR REMODELING**

**PART 1 – GENERAL**

- 1.01 SECTION INCLUDES
  - A. Provide all required demolition necessary to facilitate new construction.
  - B. Removal of designated construction.
  - C. Identification of utilities.
- 1.02 RELATED SECTIONS
  - A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
- 1.03 PROJECT RECORD DOCUMENTS
  - A. Submit under provisions of Division 0, General Requirements.
  - B. Accurately record actual utility locations, capped utilities, and subsurface obstructions.
- 1.04 REGULATORY REQUIREMENTS
  - A. Conform to all applicable codes for demolition work, safety of structure, dust control and safety of occupants.
  - B. Do not close or obstruct egress width to exits.
  - C. Do not disable or disrupt building fire safety systems without 72-hour prior written notice to and approval from Construction Manager.
  - D. Removal of all Hazardous Material must be performed in strict conformance with contract requirements as set forth in Exhibits C, D, and E, Abatement of Hazardous Materials.
- 1.05 SEQUENCING AND SCHEDULING
  - A. Sequence work in accordance with the contractor's use of the premises under the provisions of Section 00 72 00.
  - B. Schedule work under the provisions of Section 00 72 00.
  - C. Describe demolition removal procedures and schedule.
  - D. Perform all work between the hours of 7:00 a.m. and 4:00 p.m. except as required for abatement of hazardous materials and power outages. When school is in session, coordinate demolition working hours with site staff.
- 1.07 SUBMITTALS
  - A. Provide schedule indicating proposed sequence of operations for selective demolition work prior to

1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
  2. Coordinate with Owner's continuing occupation of portions of existing building.
- B. Photograph existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with the Construction Manager prior to start of work.
- 1.08 JOB CONDITIONS
- A. Occupancy: Owner will occupy portions of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in accordance with approved demolition sequence and in a manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72-hours advanced notice to Construction Manager of demolition activities that will affect adjacent occupancy.
  - B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.
    1. Conditions existing at time of inspection for bidding purposes will be maintained by Owner. However, minor variations within structure may occur by Owner's removal and salvage operations prior to start of work.
  - C. Protection: Provide temporary barricades and other forms of protection to protect occupants and public from injury.







- A. Existing mechanical pipe wrap may contain asbestos and if so, must be removed in strict conformance with the contract requirements for asbestos abatement.
- 3.07 CLEANUP AND REPAIR
- A. All areas of demolition must be left clean.
- END OF SECTION 02 41 00

SECTION 02 41 00

SITE DEMOLITION

PART 1 – GENERAL

1.01 SUMMARY

A. RELATED SECTIONS

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 01 50 00 - Construction Facilities and Temporary Controls.
3. Section 01 50 13 - Construction Waste Management and Disposal.
4. Section 32 31 19 – Site Concrete.

1.02 REGULATORY REQUIREMENTS

- A. Conform to applicable jurisdictional authority regulations and codes for disposal of debris.
- B. Coordinate clearing Work with utility companies
- C. Maintain emergency access ways at all times.
- D. Contractor shall comply with all applicable laws and ordinances regarding hazardous materials, including contaminated soils, hazardous material transformers, and similar materials or components.

1.03 SUBMITTALS:

- A. Schedule: Submit a detailed sequence of demolition and removal work, including dates for shutoff, capping, and continuance of utility services.
- B. Procedures: Submit written procedures documenting the proposed methods to be used to control dust and noise.

1.04 EXISTING CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Safety Precautions Prevent damage to existing elements identified to remain or to be salvaged, and prevent injury to the public and workmen engaged on site. Demolish roofs, walls and other building elements in such manner that demolished materials fall within foundation lines of building. Do not allow demolition debris to accumulate on site. Pull down hazardous work at end of each day; do not

Not Used

### PART 3 – EXECUTION

#### 3.01 EXAMINATION

- A. Examine conditions of work in place before beginning work, report defects.
- B. Report existence of hazardous materials or unsafe structural conditions.

#### 3.02 PREPARATION

##### A. Scheduling:

- 1. General: Coordinate and schedule demolition work as required by the Owner and as necessary to facilitate construction progress.

##### B. Hazardous Materials:

- 1. General: Identify chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations, and notify such jurisdictional agencies as may be required. Collect and legally dispose of such materials at official disposal locations away from the site.
- 2. Asbestos: If asbestos or materials containing asbestos are encountered, stop work immediately and contact the Owner. Do not proceed with demolition until directed by Owner.

##### C. Utility and Service Termination

- 1. Locate and identify existing utility, service and irrigation system components affected by work of this contract. Review existing record drawings, conduct site investigations, contact Underground Service Alert and other qualified cable/pipe/line locator services, and implement all other means necessary to define the location of underground systems.
- 2. Prior to beginning any demolition, properly disconnect all water, gas and electrical power supply at appropriate disconnect locations. Obtain all necessary releases and approvals from serving utility companies.
- 3. Prior to demolition or disconnect, obtain Owner's approval that such system does not impact facilities or systems beyond the extent of this contract.
- 4. Mark location of disconnected systems. Identify and indicate stub-out locations on Project Record Documents.

##### D. Verify that existing plant life and features designated to remain are tagged or identified.

- 1. The Architect will mark the features, trees, and shrubs to remain within the construction area. Contractor shall not commence clearing and grubbing operations until authorized by the Owner and all protective measures are in place.







8. Selected equipment of such sizes and capacities that the existing environment is disturbed as little as possible, and to afford ease of mobility within limited and relatively confined work areas. Make every effort to preserve the topography in its natural state.
9. Keep drains, catch basins, surface drainage courses and related drainage system components clear of debris and construction materials.
10. Remove irrigation piping and appurtenances as necessary within area of work, unless noted otherwise to remain. Replace irrigation piping and appurtenances to irrigate new and/or existing landscaping. Contractor shall be responsible for temporary landscape irrigation until such time that irrigation system is restored and operational.

### 3.07 DISPOSAL

Demolished materials become property of the Contractor and shall be removed from premises, except those items specifically listed to be retained by Owner.

- A. Dispose of all demolished material, trash, debris, and other materials not used in the work in accordance with the regulations of jurisdictional authority.
- B. It is **recommended** that all materials that are of a recyclable nature, be transported to a suitable legal recycling facility instead of a dump or refuse facility (unless they are one-in-the same).
- C. Burning and Burying of Materials: NOT ALLOWED.
- D. Haul Routes:
  1. Obtain permits as required by jurisdictional agencies. Establish haul routes in advance, post flagmen for the safety of the public and workmen.
  2. Keep streets free of mud, rubbish, etc.; assume responsibility for damage resulting from hauling operations; hold Owner free of liability in connection therewith.
- E. Remove demolished materials and debris from site on a daily basis.

### 3.08 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris.
- B. Clean excess material from surface of all remaining paved surfaces and utility structures.
- C. Power wash all concrete surfaces to remove stains, dried mud, tire marks, and rust spots.

END OF SECTION

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C. Shop Drawings:

1. Shop drawings sheet size shall be 24" x 30" minimum and shall not be a reproduction of the construction documents.
2. Reinforcing Steel: The correctness of the

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forms to eliminate air pockets and honeycombing. Compacting shall be done with mechanical vibrators. Vibrators shall not be used to cause concrete to flow horizontally. Thoroughly compact

- A. Control joints shall be

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tailored



**SECTION 05 12 00  
STRUCTURAL STEEL**

**PART 1 – GENERAL**

**1.01 SECTION INCLUDES**

- A. Structural steel framing members and support members.
- B. Baseplates.
- C. Grouting under baseplates.

**1.02 RELATED SECTIONS**





### 1.07 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on shop drawings.
- B. Coordinate fabrication and delivery of structural steel items with concrete work and with all other trades to permit such items to be built into the structure without delay.

### 1.08 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials to be Installed Under Other Sections: Anchor bolts and other anchorage devices which are embedded in cast-in-place concrete construction shall be delivered to the project site in time to be installed before start of cast-in-place concrete operations.
- B. Storage of Materials:
  - 1. Structural steel members which are stored at the project site shall be above ground on platforms, skids or other supports.
  - 2. Steel shall be protected from corrosion.
  - 3. Other materials shall be stored in a watertight, dry place until ready for use in the work.
  - 4. Packaged materials shall be stored in their original package or container.
  - 5. Do not store materials on the structure in a manner that might cause distortion or damage to members of supporting structures. Repair or replace damaged materials or structure as directed by Architect.

## PART 2 – PRODUCTS

### 2.01 MATERIALS

- A. Structural Steel Members: ASTM A36 / A36M-08 or ASTM A572 / A572M-07 Grade 50 where noted on plans.
- B. HSS Structural Tubing: ASTM A500 / A500M-09, grade C.
- C. Bolts and Nuts: ASTM A307-07b, grade A, with ASTM A563 07a, Grade A, hex nuts.
- D. Welding Materials: AWS D1.1 E70 or equivalent, except no E70T-4 allowed.
- E. Circular washers for common bolts: ASTM F844-07a, Type A. and ANSI B18.22.1.
- F. Beveled washers for common bolts: ANSI B18.23.1.
- G. Shop and Touch-Up Primer: TNE MEC 10-99, red metal primer or Devco DEVGUARD 4141.
- H. Expansion Anchors: Refer to Section 03 30 00.



**05 12 00**  
**STRUCTURAL STEEL**

threaded nuts welded to framing, and other specialty items as shown to receive other work. Cut, drill or punch holes perpendicular to metal surfaces. Do not flame



torch. The radius of re-entrant flame cut fillets shall be as large as possible, but never less than 1 inch. To determine the net area of members so cut, 1/8" shall be deducted from the flame cut edges not made by a mechanically guided torch. Gas cuts shall be smooth and regular. Holes for bolts shall not be cut with a torch.

5. All contact surfaces shall be cleaned before assembly.
  6. Provide setting diagrams and templates as required.
- G. Connections shall be as specified hereinbefore under "Fabrication". In addition, bolted connections shall conform to the following requirements:
1. Beveled washers shall be used under all bolt heads and nuts where they rest on beveled surfaces.
  2. Connectors shall have hexagon heads and nuts.
  3. Nuts shall be drawn up tight. Check threads of unfinished bolts with chisel or approved self-locking nuts.
  4. Bolts that have been completely tightened shall be marked with identifying symbol.
- H. Framing shall be carried up true and plumb, and temporary bracing shall be introduced wherever necessary to take care of all loads to which structure may be subjected, including erection equipment and its operation. Such bracing shall be left in place as long as may be required for safety. It shall finally be removed by the contractor as part of his equipment. As erection progresses, the work shall be securely connected to take care of all dead load, lateral loads and erection stresses. No final bolting or welding shall be done until the structure has been properly aligned.

### **3.03 ERECTION TOLERANCES**

- A. Level and plumb steel within the tolerances defined in the AISC Code of Standard Practice, latest edition.
1. Maximum Variation from Plumb: 1/4 inch per story, non-cumulative,
  2. Maximum Offset from True Alignment: 1/4 inch.
- B. Acceptance of Position and Alignment: Prior to placing or applying any other materials, the Contractor is responsible for determining that the location of the structural steel is acceptable for plumbness, level and alignment within tolerances. The erector is given timely notice of acceptance by the Contractor or a listing of specific items to be corrected in order to obtain acceptance. Such notice is rendered immediately upon completion of work and prior to start of work by other trades that may be supported, attached to the structural steelwork.

### **3.04 CLEAN-UP:**

- A. Upon completion of the work of this section, remove all surplus materials, rubbish and debris from premises.

END OF SECTION 05 12 00

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes: The following light-gauge steel framing supplementing the

**COLD-FORMED METAL FRAMING**  
**SECTION 05 40 00**



**COLD-FORMED METAL FRAMING  
SECTION 05 40 00**

- B. Certification for each welder.
- C. Sustainable Design:
  - 1. General:
    - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
    - b. Sustainable design submittals are in addition to other submittals.
  - 2. The following information shall be provided:

**COLD-FORMED METAL FRAMING**  
**SECTION 05 40 00**

- B. Store materials in protected, clean, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with manufacturer's written recommendations.

**1.9 DESIGN AND PERFORMANCE CRITERIA**

- A. Sustainable Design:

**1.12 FASTENERS**

- A. Sheet Metal Screws: Steel self-drilling tapping, corrosion resistant, complying with ASTM C1513; "TEKS" screws" by ITW Buildex; screws in accordance with ICC ESR 1976, or equal.
  - 1. Screws shall be of sufficient size to insure strength of the connection.
    - a. For Attachment of Two Members with Maximum Material Less than 0.200 Inches: #10- 18x1/2" Teks/2 panhead screws.
    - b. For Two Members with Maximum Material Less than 0.300 Inches: #10-16x3/4" Teks/3 HWH.
  - 2. Corrosion-resistant coating shall comply with ASTM F1941.
  - 3. Head Style and Drive:
    - a. Typical: Pan-head Phillips.
    - b. Provide low-profile head type beneath sheathing and where required to accommodate level application of finish materials.
  
- B. Expansion Anchors:
  - 1. General:
    - a. Fabricate from corrosion-resistant materials with capability e req2Rtyusisin,00



**2.5 ADJUSTING**

- A. Touch up field abrasions and welds and repair other damaged galvanized coating of structural framing with specified repair paint in accordance with ASTM A780/A780M, AGA publication, "Recommended Practice for Touch-up of Damaged Galvanized Coatings," and manufacturer's recommendations for application of repair paint.
- B. Work not in conformance with these Specifications and/or generally accepted standards of the trade, will be deemed defective by the Architect and will be rejected.
  - 1. Work that is defective shall be corrected.
  - 2. Corrections, redesign, and replacement of defective work shall be approved by the Architect and performed at Contractor's expense.
  - 3. Straightening of materials, if necessary, shall be done by a process and in a manner that will not injure the materials, and which is approved by the Architect. Sharp kinks or bends shall be cause for rejection. Heating will not be allowed.
- C. If defects or damaged work cannot be corrected in the field, the material shall be returned to the shop or new parts furnished, as the Architect directs; the Contractor shall replace all such work at his own expense.

**2.6 FASTENING SCHEDULE**



1.06 FIELD MEASUREMENTS

- A. Field verify all dimensions prior to fabrication.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. General: All material that will be exposed must be smooth and free of surface blemishes including pitting, seam marks, roller marks, trade names and irregularities.
- B. Steel Sections: ASTM A36 / A36M-08.
- C. Steel Tubing: ASTM A500, Grade B.
- D. Stainless Steel Pipe: ASTM A312 heavy-wall .
- E. Pipe and Downspouts: ASTM A53 / A53M-07, Type E, Grade B.
- F. Plates: ASTM A36 / A36M-08.
- G. Bolts, Nuts, and Washers: ASTM A307-07b.
- H. Drilled-in Concrete Anchors: Hilti "Kwik Bolt TZ" (ICC Report No. ESR-1917), Ramset T3 (ICC Report No. ESR-1955), or accepted equal; stainless steel for all exterior work; testing required.
- I. Drilled-in Masonry Anchors: Hilti "Kwik Bolt 3" (ICC Report No. ESR-1385), Ramset T3 (ICC Report No. ESR-1955), or accepted equal; stainless steel for all exterior work; testing required.
- J. Welding Materials: AWS D1.1; type required for materials being welded.
- K. Shop and Touch-Up Primer: TNEMEC 10-99 - Red primer or Devco DEVGUARD 4141.
- L. Touch-Up Primer for Galvanized Surfaces: Zinc rich type.
- M. Metal Framing Channels: Channel members shall be fabricated from structural grade steel conforming to ASTM A924-09a; P1000 as manufactured by Unistrut or approved equal. Finish shall be hot-dip galvanized coating.
- N. Pipe/Conduit Clamps: Punch-press made from hot-rolled, pickled and oiled steel plates, strip or coil and conform to ASTM A36 / A36M-08; P2600 as manufactured by Unistrut or approved substitute. Finish shall be hot-dip galvanized coating.
- O. Non-Shrink Grout: Euco-Dry Pack Grout, natural aggregate, high strength non-shrink. "Pac-It" - W.R. Meadows, or approved equal.
- P. Removable Post Insert Sleeves: For mounting new posts/rails in new concrete, Wagner Companies EZ SLEEVE or equal. (888)243-6914.

2.02 FABRICATION

A. Workmanship

1. Form exposed work true to line and level with accurate angles and surfaces and straight, sharp edges.
2. Ease exposed edges to a radius of approximately 1/32 inch, unless indicated otherwise.
3. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.
4. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with



- F. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- H. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

### 2.03 FINISHES

- A. Prepare surfaces to be primed in accordance with SSPC SP 2.
- B. Prime all surfaces that are not scheduled to receive galvanization, except, do not prime surfaces embedded in concrete nor in areas of field welds until welds are completed and inspected.
- C. Prime paint items with one coat.
- D. Galvanize in accordance with ASTM A123 / A123M-09, designated steel items. Provide minimum 1.25 oz/sq ft galvanized coating.
- E. Stainless steel pipe shall have a light brushed satin 626 or similar finish.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Beginning of installation means erector accepts existing conditions.

### 3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.

### 3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated on shop drawings.
- D. Perform field welding in accordance with AWS D1.1.

- E. Obtain Architect approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- G. At all welded and fabricated stainless steel pipe fabrications, miter weld and grind smooth all joints and finish to pipes standard 626 similar satin brushed finish.

#### 3.04 SCHEDULE

- A. The Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.
  - 1. Steel pipe railing, (galvanized at exterior, primed at interior).
  - 2. Stainless steel pipe handrails, heavy-wall, 626 satin finish, diameter as indicated on the drawings.
  - 3. Pipe rail wall support brackets, (galvanized at exterior, primed at interior).
  - 4. Steel pipe downspouts and downspout support brackets, galvanized.
  - 5. Unistrut P-1000 Support System.

END OF SECTION



- E. Shop Drawings: Include plans, elevations, sections, panel dimensions, details, and attachments to other work.
- F. Samples for Initial Selection:
  - 1. Submit minimum 2-inch by 2-inch samples. Indicate full color, texture and pattern variation.
- G. Samples for Verification:
  - 1. Submit minimum 4-inch by 4-inch sample for each type, texture, pattern and color of solid plastic fabrication.
- H. Mockups:
  - 1. Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects.
  - 2. Build mockup of each type of Plastic Fabrication.
  - 3. Approved mockups may become part of the completed Work if undisturbed at time of

- E. Before installing Plastic Fabrications, permit them to reach room temperature.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install Solid Polymer Fabrications until spaces are enclosed and weatherproof, and ambient temperatures and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

## 1.7 WARRANTY

- A. Manufacturer's Special Warranty on Plastic Fabrications: Manufacturer's standard form agreeing to repair or replace units that fail in material or workmanship within the specified warranty period.
- B. Warranty Period: 1 year after the date of substantial completion.
- C. The warranty shall not deprive the owner of other rights or remedies the Owner may have under other provisions of the Contract Documents, and is in addition to and runs concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturer: 3form, LLC., Salt Lake City, Utah, USA / telephone 801-649-2500.
- B. Or approved equal.

### 2.2 MATERIALS

- A. Varia Sheet
  1. Engineered co-polyester resin produced in the USA.
  2. Sheet Size: Maximum 4 foot x 10 foot.
  3. Thickness: Minimum 1/2 inch.
  4. UV Protection: Required.
  5. Surface Finish: TBD from standard finishes selections.
  6. Basis of Design Product: Varia Stand-Off Wall Feature.
- B. Interlayer Materials: Compatible with polyesters and bonding process to create a monolithic sheet of material when complete. Interlayer material shall be chosen from manufacturer's full line of interlayers OR District provided artwork will be used.
- C. Sheet minimum performance attributes:
  1. Rate of Burning (ASTM D 635). Material must attain CC1 Rating for a nominal thickness of 1.5 mm (0.060 in.) and greater.
  2. Self-Ignition Temperature (ASTM D 1929). Material must have a Self-ignition temperature greater than 650°F.
  3. Density of Smoke (ASTM D 2843). Material must have a smoke density less than 75%.
  4. Flame spread and Smoke developed testing (ASTM E 84). Material must be able to meet a level of Class A (Flame spread less than 25 and smoke less than 450) at thickness of 1/8", 3/16" and 1".
  5. Room Corner Burn Test (NFPA 286). Material must meet Class A criteria at 1/4" (walls only) and 3/8" (walls only/standoffs only) thickness as described by the 2012 *Intas* manufacturer ~~(at the discretion~~



5. Matched Mold Forming
  6. Mechanical Forming
- E. Laminating: Laminate to substrates indicated using adhesives and techniques recommended by manufacturer.

#### 2.4 MISCELLANEOUS MATERIALS

- A. General: Provide products of material, size, and shape required for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaner: Type recommended by manufacturer.
- C. Fasteners: Use screws designed specifically for plastics. Self-threading screws are acceptable for permanent installations. Provide threaded metal inserts for applications requiring frequent disassembly such as light fixtures.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where installation of Plastic Fabrications will occur, with Installer present, for compliance with manufacturer's requirements. Verify that substrates and conditions are satisfactory for installation and comply with requirements specified.

#### 3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions for the installation of Plastic Fabrications.
- B. Manufacturer's shop to fabricate items to the greatest degree possible.
- C. Utilize fasteners, adhesives and bonding agents recommended by manufacturer for type of installation indicated. Material that is chipped, warped, hazed or discolored as a result of installation or fabrication methods will be rejected.
- D. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
- E. Form field joints using manufacturer's recommended procedures. Locate seams in panels so that they are not directly in line with seams in substrates.

#### 3.3 CLEANING AND PROTECTION

- A. Protect surfaces from damage until date of substantial completion. Repair work or replace damaged work, which cannot be repaired to Architect's satisfaction.

END OF SECTION





- a. No. 23-2 - "Construction and Industrial Plywood".
- 2. California Building Code, CBC 2022..
- F. References and Standards: Provide materials graded under latest Edition of the pertinent following Agencies:
  - 1. American Society for Testing and Materials (ASTM).
  - 2. Lumber: West Coast Lumber Inspection Bureau (WCLIB), Rule 17, Standard Grading Rules for West Coast Lumber.
  - 3. Lumber: Western Wood Products Association (WWPA); Western Lumber Grading Rules.
  - 4. Plywood: American Plywood Association (APA) Plywood Specifications and Grades and Voluntary Product Standard DOC PS 1 "Construction and Industrial Plywood".
  - 5. Wood Preservative: American Wood Protection Association (AWPA), Standard U1.
  - 6. California Building Code, latest edition.
- G. Design Criteria: Pressure treatment shall not adversely affect application, permanence, or appearance of finish paint system.
- A. Submit under provisions of Division 0, General Conditions.
- B. Certification:
  - 1. Pressure Treated Wood: Certification for water-borne preservative that moisture content was reduced to 19% maximum, after treatment.
  - 2. Pressure Treated Wood: Submit certification by treating plant stating the chemicals and process used, net amount of salts retained, and conformance with applicable standards.
- A. Protection, General: Protect wood from moisture while being stored and while work is in progress.
- B. Protection:
  - 1. After delivery, store all materials in such a manner as to ensure proper ventilation and drainage and to protect against damage and the weather.
  - 2. Keep all material clearly identified with all grade marks legible; keep all damaged material clearly identified as damaged, and separately store to prevent its inadvertent use. Do not allow installation of damaged or otherwise non-complying

material.

3. Use all means necessary to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.
- A. Environmental Requirements: Maintain uniform moisture content of lumber at 19 percent or less prior to close-in.
- B. Sequencing: Coordinate details with other work supporting, adjoining, or fastening to rough carpentry work.

A. Wood:

1. Lumber (Blocking, Backing, Stripping, Furring, and Nailers): WCLIB Construction.
2. Lumber (Wood Framing): Meet requirements of following minimum grades, and as noted on Structural Drawings.

<u>Item</u>	<u>Species</u>	<u>Grade</u>	<u>Reference</u>
Studs	D.F.	No. 2 (2 x 4 Light Framing)	WCLIB 124
Studs	D.F.	No. 2 (2x6 & 2x8)	WCLIB 121
Plates	D.F.	No. 2 (2x, 3x, 4x)	WCLIB 123
Joists	D.F.	No. 1 (2x, 3x)	WCLIB 123
Beams	D.F.	No. 1 (4x)	WCLIB 123
Posts	D.F.	No. 1 (4x)	WCLIB 123
Beams	D.F.	No. 1 (6x)	WCLIB 130
Posts	D.F.	No. 1 (6x)	WCLIB 131

3. 3x and larger lumber shall be free of heart center.
4. 2x6 T & G Douglas Fir No. 1.

B. Plywood:

1. Roof and Wall Structural Sheathing: PS-1 Structural 1, CDX APA with exterior glue.
2. Thickness and type shall be as indicated on Drawings.

C. Pressure-Treated Lumber:

1. Douglas Fir pressure-treated.

- concrete, masonry or grout.
- b. Required for all rooftop blocking.

D. Preservative Treatment

1. Furnish pressure treated Douglas Fir in accordance with AWPA, Standard U1. Each piece is required to bear AWPA stamp.
2. Field treat cut edges and holes drilled in factory treated lumber with an approved AWPA Standard U1 preservative product.
3. For fastener requirements, see Paragraph 2.01-F-8.

E. Rough Hardware Fastenings and Connections: All types including bolts, lag screws, nails, spikes, screws, washers, framing devices and other rough hardware, or kinds that may be purchased and that require no further fabrication, shall be furnished and installed for all finish and rough carpentry. All exterior hardware shall be hot-dipped galvanized per ASTM A123 / A123M-09 Standards.

1. Nails: ASTM F1667 Common wire nails or spikes; box nails not permitted.
2. Wood Screws: Wood Screws: ANSI Standard B18.6.1; use galvanized type for exterior work.
3. Lag Screws: Conform to ASTM A307-07b and ANSI Standard B18.2.1. Dimensions and installation shall conform to requirements described in the National Design Specification (NDS), current edition.
4. Bolts: ASTM A307-07b, Grade A, hexagonal heads, unless noted otherwise.
5. Washers: Washers for bearing against wood shall be provided under all bolt

1. Air- or kiln-dry to maximum 19 percent moisture content, prior to and at time of installation. Lumber must be 19 percent moisture content prior to close-in and finish.
2. Furnish S4S unless otherwise noted.
3. Size to conform with rules of governing standard. Sizes shown are nominal unless otherwise noted.

serve its intended function.

- C. Lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting. No load carrying member shall be exposed to earthen materials.
- D. Shimming: Do not shim any framing component.
- A. Nailing: Except as otherwise indicated on Drawings or specified, all nailing shall be as scheduled on Drawings:
  - 1. Nails or Spikes shall be common wire unless noted otherwise. Penetration of nails or spikes shall be one-half the length of the nail or spike into the piece receiving the point. However, to connect pieces 2 inches in thickness, 16d nails shall be used unless noted otherwise.
    - a. Bore holes for nails wherever necessary to prevent splitting.
    - b. Use finish or casing nails for finish work.
    - c. Use of nailing guns is as limited by CBC and must be approved by Architect and DSA. Submittal of guns and nails is required.
- B. Bolts: Bolts shall be of sizes indicated. Drive fit with washers under nuts. Tighten all bolts and screws before closing in.
- C. Framing Devices: As specified under Products, sizes as indicated. Use half-length nails where required.
- D. Lag Screws: Pre-Bore lead holes and install per NDS, current edition.
- A. Sills: Shall be in long lengths of sizes shown, fastened with anchor bolts at exterior walls and with powder driven fasteners at interior walls as indicated, a minimum of two (2) fasteners per piece and a bolt within 9" but not nearer than 6" from end of piece. Place malleable iron or steel plate washers (but not cut washers) under nuts bearing on wood. Set sills level and true and bed exterior wall sills and interior bearing wall sills on 1/2 inch dry-pack or non-shrink grout.
- B. Studs, Posts and Columns: Shall be full length. Corners shall be as detailed. Partitions or walls containing plumbing, heating or other piping shall be so formed as to give proper clearance for materials. Cut members as required to provide full bearing at ends. Connect to structure as indicated.
- C. Plates: Shall be in long lengths and spliced as shown.
- D. Blocking: Shall be same thickness and width of studs or joists unless shown otherwise. Blocking shall not be spaced over 8'-0" o.c. Install fire blocking in accordance with CBC, Section 717. Install blocking at all plywood joints unless otherwise noted on the drawings. Install blocking for fastening all surface applied items.

- E. Joists and Beams: Shall be in long lengths and spliced over bearings unless shown otherwise. Install with crown side up. Beams or headers indicated to be built up of two or more joists shall be fabricated on the job using full length members. For two piece members, stitch nail pieces together with 16d common nails spaced not over 12" o.c. and staggered. Clinch nails protruding through members.



SECTION 06 20 00  
FINISH CARPENTRY







- A. Provide and install all miscellaneous finish carpentry items to conform to the workmanship quality specified above and shown on the Drawings. Millwork shall be installed in a neat, workmanlike manner, free of hammer marks and surface defects. Pieces shall fit together neatly with all corners mitered. Do not install finish carpentry until it has been backprimed as specified in Painting Section 09 90 00.

3.04 CLEAN-UP

- A. General: Keep the premises in a neat, safe and orderly condition at all times during execution of this portion of the work, free of accumulations of sawdust, cut-ends and debris.
- B. Clean-up: Upon completion of the work of this Section, remove all surplus materials, rubbish and debris from the premises and leave "broom clean".

END OF SECTION

SECTION 06 41 00  
ARCHITECTURAL CASEWORK

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Special fabricated cabinet units.
2. Countertops.
3. Preparation for utilities.
4. Cabinet hardware.

B. Related Sections:

1. A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. 06 10 00 - Rough Carpentry.
3. 09 29 00 – Gypsum Board.

1.02 REFERENCES

- A. North American Architectural Woodwork Standards (NAAWS).
- B. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- C. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- D. ASTM C615 - Standard Specification for Granite Dimension Stone.
- E. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.

1.03 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Include materials, component profiles, fastening methods, assembly methods, joint details, accessory listings, and schedule of finishes. Provide WI Certified Compliance label on first page of each set. Shop drawings will be rejected until reviewed by the assigned Woodwork Institute inspector and label has been issued.
- C. Product Data: Manufacture literature for all hardware to be provided.

D. Samples:

1. Finishes for color selection.
2. Hardware: drawer pulls, hinges, locks and other hardware accessories.
3. Identification tag and fasteners.
4. Submit two physical samples and product data sheets of drawer pulls, hinges, locks, ID tags, and other specified hardware accessories, illustrating hardware type and finish.

1.04 QUALITY ASSURANCE

- A. Manufacture casework items in accordance with quality standards of the NAAWS.
- B. All millwork and the installation of millwork shall be monitored for compliance under the scope of the WI Certified Compliance Program (CCP).
- C. Provide WI Inspection Service at the millwork fabricator. Provide to Architect a written report showing the results of the inspection.
- D. Issue WI Certified Compliance Certificate to Architect prior to delivery of millwork and provide WI Certified Compliance Labels on all items of casework and countertops.
- E. Provide WI Reinspection Service at the job site prior to installation. Provide to Architect a written report showing the results of the reinspection.
- F. Self-Certification by the millwork fabricator or inspection by other than an authorized representative of The Woodwork Institute is not acceptable.
- G. Upon completion of the installation, provide a WI Certified Compliance Certificate.
- H. Regulatory Requirements
  1. Conform to CBC requirements for flame spread classification.
  2. Conform to Flame Spread Classifications of Interior Millwork contained within the Appendix of the NAAWS for flame spread ratings as tested according to ASTM E84.



- c. Construction: Style A-Frameless
- d. Joinery: Frameless
- e. Cabinet Backs: Dadoed (Detail 2C and 78 of Millwork Man.) Type A. Type B for glass
- f. Cabinet Door Type: Type A. Type B for glass
- g. Shelves:
  - All shelving less than 25" to be 3/4-inch-thick melamine covered Industrial Board.
  - All shelves between 25" to 34" to be 1" inch thick melamine covered Industrial Board.
  - All shelves between 34" to 46" to be 3/4" inch thick HPL covered Veneer Core DF Plywood.
  - All shelves over 46" to be 1" inch thick HPL covered Veneer Core DF Plywood.
- h. Shelf Edge Bands:
  - 1mm PVC in color to match shelf at three concealed sides. 3mm PVC at exposed leading edge.
- i. Door and Drawer Edge Bands:
  - 3 mm PVC radiused 1/8 inch at edge. Solid color as selected by Architect.
- j. Exposed Surfaces (including shelves and interior of open front cabinets):
  - .045-inch thick high pressure plastic laminate.
- k. Semi-Exposed Surfaces (behind doors and inside drawers):
  - Low pressure decorative polyester or melamine laminate ALA-85.
- l. Security and Dust Panels: Particle board, 3/4 inch thick at all lockable drawers.

E. Countertops - Laminated Plastic

- 1. Fabricate in accordance with Section 11 of the NAAWS:
  - a. NAAWS Grade: Premium
  - b. Core Thickness: .075 inch minimum
  - c. Laminate Thickness: 1.50 inch or .042 inch for postformed use
  - d. Edge Covering: --
  - e. Backsplash: Square butt
  - f. Top of Back Splash: Square self-edge
  - g. Colors and Pattern: To be selected by Designer

G. Hardware

- ~~1. Finish: Satin Aluminum.~~
- ~~2. Shelf Standards: Knape and Vogt 255ZC (bright zinc plated).~~
- ~~3. Shelf Supports: Knape and Vogt 256ZC (bright zinc plated).~~
- ~~4. Shelf Fastener Supports: Knape and Vogt 243ZC (bright zinc plated) 2 each shelf.~~
- ~~5. Shelf Supports: Hettich "Sekura" or approved equal all metal construction with 80 lb load rating. Retention pins only required at front shelf support clips. Rear clips may be non-retention pin type. Clips set in drilled holes spaced 32 mm on center.~~
- ~~6. Drawer and Door Pulls: 5 inch Epco 'U-shaped' wire pulls, Hafele, or approved equal. Pulls shall comply with CCR Section 11178.6(4) and 11258.4.~~

10. Drawer slides for File Drawers: Grant No. 329 heavy duty ball bearing full extension slides with 100 lbs. capacity at large flat file drawers use Accuride No. 3640, 200 lbs., full extension, ball bearing, rail mount slides.
11. Hinges: Rockford Process Control, No. 851, heavy duty wrap-around, tight pin butts of steel, 2-3/4 inch minimum width with companion magnetic door catch capable of a minimum 10 pound pull capacity. Hinges per leaf: 3 feet 0 inch high doors — two (2) hinges, 3 feet 0 inch to 5 feet 0 inch high doors — three (3) hinges, 5 feet 0 inch to 7 feet 4 inch high doors — four (4) hinges, 7 feet 0 inch to 8 feet 0 inch — five (5) hinges.
12. Magnetce0 -3u oors – 228-1(c)1(a: l1(5)1s294 ,af:)1( 31( Hain)-1)-1(draw)1(ers2aw)6 6006heav



- A. Set and secure casework in place rigid, plumb, and level.
- B. Install casework in accordance with Section 10 and the Appendix of the NAAWS.

3.03 ADJUSTING AND CLEANING

- A. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.
- B. Clean casework, counters, shelves, hardware, fittings and fixtures.

END OF SECTION

SECTION 07 21 00  
THERMAL INSULATION

PART 1 – GENERAL

1.02 SUMMARY

A. SECTION INCLUDES

1. Sound Insulation.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Johns-Manville.
- B. Owens–Corning Fiberglass Corporation
- C. Celotex Corporation
- D. CertainTeed Corporation.
- E. USG Thermafiber (at fire rated construction assemblies where required by listed Design Number).
- F. Approved equal.

2.02 MATERIALS:

- A. Type A, Sound Insulation: A batt-like non-combustible, formaldehyde free product manufactured from inorganic fibers for installation in framed wall cavities. The nominal 16 inch, or as required x 96 inch batts shall be un-faced.
  - 1. Un-faced insulation shall comply with ASTM C-665, Type I. Provide fire rated type insulation at all rated walls to receive insulation.
  - 2. Product Fire Hazard Classification Rating as required by the specified codes and standards for use at locations and conditions indicated.
  - 3. Thickness: As required to fill full depth of wall cavity.
  - 4. Flame Spread = 25, Smoke Developed = 50.
  - 5. Use at ALL interior partial height framed walls.

2.03 MISCELLANEOUS MATERIALS:

- A. All other materials, such as additional insulation materials, fasteners, line wire, tape and retainers, not specifically described but required for a complete and proper installation of building insulation, shall be subject to submittal approvals.

- A. Prior to all work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this installation may begin.
- B. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in discrepant areas until all such discrepancies have been fully resolved.

3.02 INSTALLATION:

- A. Batt, Blanket Insulation: Provide insulation barrier system with no voids in system. Keep end joints to a minimum. Install with vapor barrier to warm (interior) side. Fit ends and edges tight to framing members. Keep all piping and other work on warm side of insulation. Provide tape vapor barrier joints. Tape as required.

3.03 PROTECTION:

- A. Protect installed insulation from damage until covered.

END OF SECTION

SECTION 07 90 00  
JOINT SEALERS

PART 1 – GENERAL

1.01 SUMMARY

A. SECTION INCLUDE

1. Preparing sealant substrate surfaces.
2. Sealant and sealant backing for materials.

B. RELATED SECTIONS

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
6. Section 08 11 16: Aluminum Entrance Doors.
7. Section 09 29 00: Gypsum Board Systems.
8. Division 22: Mechanical.
9. Division 26: Electrical.

C. REFEREcm Aa1(S)JTJ ET Q q 1 0 0 1 3295.4001





- E. Solvents: cleaning agents or other accessory materials shall be as recommended by the sealant manufacturer.

### PART 3 – EXECUTION

#### 3.01 EXAMINATION

- A. Verify that surfaces and joint openings are ready to receive work and field measurements are as shown on Drawings and recommended by the manufacturer.
- B. Beginning of installation means installer accepts existing surfaces.

#### 3.02 PREPARATION

- A. Clean and prime joints in accordance with manufacturer's instructions.
- B. Remove loose materials and foreign matter which might impair adhesion of sealant.









- C. Indicate door elevations, internal reinforcement, closure method, and cut outs for glazing and louvers.
- D. Submit two (2) samples of exterior frame profile at mullion intersection.
- E. Submit Label Certificate FC-1, Figure 3-3, from the Nonresidential Compliance Manual documenting compliance with the CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 6, Section 116, Table 116-A and 116-8.

2.02 MATERIALS

A. Doors, Panels and Frames

9. Surface Bolt	0.093 inch
10. Surface Applied Closer	0.093 inch
11. Hold Open Arm	0.093 inch
12. Pull Plates and Bars	0.067 inch
13. Surface Exit Device	0.093 inch
14. Floor Checking Hinge	0.167 inch
15. Pivot Hinge	0.167 inch

G. Sound Transmission Coefficient (STC): 43 or better.

### 2.03 ACCESSORIES

A. Door Vision Lites: 20-gauge galvanized frame, grey primer, field painted. Size as shown on Drawings.

1. Anemostat security door louvers, model #LoPro.
2. Or approved equal.

B. Rubber Silencers: Provided by Section 08 71 00. Coordinate installation.

C. Glazing Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamperproof screws at door installations, square butt at light frames.

- J. Reinforce frames wider than 48 inches with roll formed, 0.093-inch-thick steel channels fitted tightly

- B. Install doors in accordance with DHI.
- C. Install fire doors and frames in accordance with NFPA 80.
- D. Installation of exterior doors and frames to be weathertight and waterproof.
- E. Seal penetration of all surface applied screws on exterior face of frames at glass stops and hardware attachments.
- F. Coordinate with wall construction and details for anchor placement. Provide anchors as follows:
- G. Frames up to 7 feet 6 inches height - 4 anchors each jamb.
- H. Frames 7 feet 6 inches to 8 feet 0-inch height - 5 anchors each jamb, plus an additional anchor for each 2 feet or fraction thereof over 8 feet 0 inch.
- I. Frames for double doors; minimum of two (2) anchors in head approximately 12 inches from each jamb.
- J. Borrowed lite frames; two (2) anchors each jamb plus 1 for each 18 inches or fraction thereof over 3 feet 0 inch. Minimum two (2) anchors in head and sill approximately 12 inches from each jamb plus 1 for each 30 inches of length or fraction thereof.
- K. Floor anchors - one (1) anchor each jamb for interior doors. Where wall construction will not allow placement of floor anchor, provide one (1) additional jamb anchor as close to floor as possible.
- L. Existing wall anchors shall be welded to provide non-removable condition. Welded bolt head to be ground, dressed and finished smooth.
- M. Frames installed in masonry walls to be fully grouted with masonry grout.
- N. Exposed field welds to be finished smooth and touched up.
- O. Primed or painted surfaces which are scratched or marred shall be touched up.
- P. Hardware to be applied in accordance with hardware manufacturer's templates and instructions.
- Q. Coordinate installation of glass and glazing.
- R. Install door louvers.
- S. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

### 3.02 CONSTRUCTION

#### A. INSTALLATION TOLERANCES



METAL DOORS AND FRAMES

08 11 00 - 8

SECTION 08 31 00  
ACCESS DOORS AND PANELS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Steel access panels, except those specified under Divisions 22 - Plumbing, 23 - HVAC, or 26 - Electrical.

B. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 05 40 00: Cold Formed Metal Framing.
4. Section 09 29 00: Gypsum Board.
6. Section 09 91 00: Painting.
7. Division 26: Electrical.
8. Division 27: Communications.

1.02 SUBMITTALS

A. Shop Drawings:

1. Indicate sizes, materials, thickness, fabrication methods, panel door and frame reinforcement, anchorage, and installation details.
2. Provide layout drawings, indicating dimensioned locations of proposed access panels, size of each panel, and installation details. Determine and indicate required access panels in finished surfaces, whether furnished under this section or as part of Work of Divisions 22-Plumbing, 23-HVAC, and 26- Electrical.

PART 2 – PRODUCTS

3.02 INSTALLATION

- B. Install panels accurately in location, perfect alignment, plumb, straight and true. Brace to prevent displacement by adjacent Work.
- C. Examine panels after installation for proper opening, closing and clearances. Replace damaged or defective panels.

3.03 CLEANING

- A. Remove rubbish, debris and waste materials and legally dispose of off Project site.

3.04 PROTECTION

- A. Protect Work of this section until Substantial Completion.

END OF SECTION

SECTION 08 41 00  
ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

## PART 1 - GENERAL

## 1.01 SUMMARY

## A. Section Includes:

1. Aluminum doors complete with hardware.

## B. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 05 40 00 Cold Formed Metal Framing.
3. Section 07 90 00 Joint Sealants.
4. Section 08 71 00 Door Hardware.
5. Section 08 80 00 Glazing.

## 1.02 REFERENCES

## A. Aluminum Association (AA):

1. DAF-45 Designation System for Aluminum Finishes.

## B. American Architectural Manufacturers Association (AAMA):

1. 501.2 Field Check of Metal Curtain Walls for Water Leakage.
2. 2605 Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
3. 606.1 Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum.
4. 607.1 Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
5. 608.1 Specification and Inspection Methods for Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum.
6. 701.2 Specifications for Pile Weatherstripping.
7. Manual #10 Care and Handling of Architectural Aluminum From Shop to Site.
8. SFM 1 Aluminum Storefront and Entrance Manual.

## C. American National Standards Institute (ANSI):

1. A117.1 Safety Standards for the Handicapped.

## D. American Society for Testing and Materials (ASTM):

1. A36 Structural Steel.
2. A123 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. B209 Aluminum and Aluminum - Alloy Sheet and Plate.

4. B221 Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
5. B308 Aluminum-Alloy 6061-T6 Standard Structural Shapes, Rolled or Extruded.
6. E283 Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors.
7. E330 Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
8. E331 Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

E. Federal Specifications (FS):

1. TT-P-641G(1) Primer Coating, Zinc Dust-Zinc Oxide (For Galvanized Surfaces).
2. TT-P-645A Primer, Paint, Zinc Chromate, Alkyd Type.

F. Steel Structures Painting Council (SSPC):

1. Paint 12 Cold-Applied Asphalt Mastic (Extra Thick Film).

### 1.03 SYSTEM REQUIREMENTS

A. Design Requirements:

1. Drawings are diagrammatic and do not purport to identify nor solve problems of thermal or structural movement, glazing, anchorage, or moisture disposal.
2. Requirements shown by details are intended to establish basic dimension of units, sight lines and profiles of members.
3. Provide concealed fastening.
4. Provide entrance and storefront systems, including necessary modifications, to meet specified requirements and maintaining visual design concepts.
5. Attachment considerations are to take into account site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening or fracturing connection between units and building structure or between units themselves.
6. Anchors, fasteners and braces shall be structurally stressed not more than 50% of allowable stress when maximum loads are applied.
7. Provide for expansion and contraction due to structural movement without detriment to appearance or performance.

### 1.04 SUBMITTALS

A. General: Submit in accordance with Conditions of the Contract and Division 1 Specification sections.

B. Product Data:

1. Submit manufacturer's descriptive literature and product specifications.
2. Include information for factory finishes, hardware, accessories, and other required components.
3. Include color charts for finish indicating manufacturer's standard colors available for

selection.

C. Shop Drawings:

1. Submit shop drawings covering fabrication, installation and finish of specified systems.
2. Include following:
  - a. Fully dimensioned plans and elevations with detail coordination keys.
  - b. Locations of exposed fasteners and joints.
3. Provide detailed drawings of:
  - a. Composite members.
  - b. Joint connections for framing systems and for entrance doors.
  - c. Anchorage.
  - d. System reinforcements.
  - e. System expansion and contraction provisions.
  - f. Glazing methods and accessories.
  - g. Internal sealant requirements and recommended types.
4. Schedule of finishes.

D. Samples:

1. Submit manufacturers standard samples indicating quality of finish.

- D. Do not leave coating residue on any surfaces.
  - E. Replace damaged units.
- 1.07 WARRANTY
- A. Provide warranties in accordance with Division 01.
  - B. Provide written warranty in form acceptable to Owner jointly signed by manufacturer, installer and Contractor warranting work to be watertight, free from deflective materials, defective workmanship, glass breakage due to defective design, and agreeing to replace components which fail within 1 year from date of Substantial Completion.
  - C. Warranty shall cover following:
    - 1. Complete watertight and airtight system installation within specified tolerances.
    - 2. System is structurally sound and free from distortion.
  - D. Provide written warranty stating organic coating finish will be free from fading more than 10%, chalking, yellowing, peeling, cracking, pitting, corroding or non-uniformity of color, or gloss deterioration beyond manufacturer's descriptive standards for 5 years from date of Substantial Completion and agreeing to promptly correct defects.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS AND PRODUCTS

- A. Subject to compliance with requirements indicated, provide products by one of the following:
  - 1. Oldcastle BuildingEnvelope, Terrell, TX.
  - 2. Or approved equal.
- B. Substitutions: Submit under provisions of Division 01.
- C. Acceptable Door Entrance Systems:

Standard duty systems (0.125" wall thickness; 1-3/4" deep)  
Model 500 - wide stile (12" bottom rail, 4-1/2" top rail, 5-1/2" verticals)
- D. Storefront Systems:

FG-2000 1-3/4 x 4-1/2 inch framing that accepts 1/4 glass.

### 2.02 FRAMING MATERIALS AND ACCESSORIES

- A. Aluminum:
  - 1. ASTM B221, alloy 6063-T5 for extrusions; ASTM B209, alloy 5005-H16 for sheets; or other alloys and temper recommended by manufacturer appropriate for specified finish.



- B. Internal Reinforcing:
    - 1. ASTM A36 for carbon steel; or ASTM B308 for structural aluminum.
    - 2. Shapes and sizes to suit installation.
    - 3. Steel components factory coated with alkyd type zinc chromate primer complying with FS TT-P-645.
  - C. Anchorage Devices:
    - 1. Manufacturer's standard formed or fabricated steel or aluminum assemblies of shapes, plates, bars or tubes.
    - 2. Hot-dip galvanize steel assemblies after fabrication, comply with ASTM A123, 2.0 ounce minimum coating.
  - D. Fasteners:
    - 1. Aluminum, non-magnetic stainless steel or other non-corrosive materials compatible with items being fastened.
    - 2. Provide concealed fasteners wherever possible.
    - 3. For exposed locations, provide Phillips flathead screws with finish matching item fastened.
    - 4. For concealed locations, provide manufacturer's standard fasteners.
  - E. Expansion Anchor Devices: Lead-shield or toothed-steel, drilled-in, expansion bolt anchors.
  - F. Protective Coatings: Cold-applied asphalt mastic complying with SSPC-Paint 12, compounded for 30 mil thickness for each coat; or alkyd type zinc chromate primer complying with FS TT-P-645.
  - G. Touch-Up Primer for Galvanized Components: Zinc oxide conforming with FS TT-P-641.
  - H. Glazing Gaskets:
    - 1. Compression type design, replaceable, molded or extruded, of neoprene, polyvinyl chloride (PVC), or ethylene propylene diene monomer (EPDM).
    - 2. Profile and hardness as required to maintain uniform pressure for watertight seal.
  - I. Weatherstripping:
    - 1. Wool pile conforming to AAMA 701.2.
    - 2. Provide EPDM or vinyl blade gasket weatherstripping in bottom door rail, adjustable for contact with threshold.
  - J. Adjustable and Fixed Vertical Corners:
    - 1. Field adjustable corner with 168 degree to 178 degree range of movement. Equal to Old Castle Part No. V0508.
    - 2. Outside corner set at 135 degrees. Equal to Old Castle Part No. V0510.
- 2.03 GLASS AND GLAZING ACCESSORIES
- A. Refer to Section 08 80 00.

## 2.04 DOOR HARDWARE

- A. Refer to Section 08 71 00.

## 2.05 FABRICATION

- A. Coordination of Fabrication:

1. Check actual frame or door openings required in construction work by accurate field measurements before fabrication.
2. Fabricate units to withstand loads which will be applied when system is in place.

- B. General

1. Conceal fasteners wherever possible.
2. Reinforce work as necessary for performance requirements, and for support to structure.
3. Separate dissimilar metals and aluminum in contact with concrete utilizing protective coating or preformed separators which will prevent contact and corrosion.
4. Comply with Section 08 80 00 for glazing requirements.

- D. Entrance Doors:

1. Fabricate with mechanical joints using internal steel reinforcing plates and shear blocks attached with fasteners and by welding.
2. Provide extruded aluminum glazing stops of square design, permanently anchored on security side and removable on opposite side.

- E. Hardware:

1. Receive hardware supplied in accordance with Section 08 71 00 and install in accordance with requirements of this Section.
2. Cut, reinforce, drill and tap frames and doors as required to receive hardware.
3. Comply with hardware manufacturer's templates and instructions.
4. Use concealed fasteners wherever possible.

- F. Welding:

1. Comply with recommendations of the American Welding Society.
2. Use recommended electrodes and methods to avoid distortion and discoloration.
3. Grind exposed welds smooth and flush with adjacent surfaces; restore mechanical finish.

- G. Flashings: Form from sheet aluminum with same finish as extruded sections. Material thickness as required to suit condition without deflection or "oilcanning".

## 2.06 FINISHES

- A. Clear Anodized:

1. Conforming to AA-M12C22A31 and AAMA 607.1.
2. Architectural Class II, etched, medium matte, clear anodic coating, 0.4 mil minimum thickness.
3. Match existing storefront clear anodized as close as possible.

## PART 3 - EXECUTION

## 3.01 EXAMINATION

- A. Examine conditions and proceed with Work in accordance with Section 01 43 00.

## 3.02 INSTALLATION

- A. Erection Tolerances:
  - 1. Limit variations from plumb and level:
    - a. 1/8 inch in 10'-0" vertically.
    - b. 1/8 inch in 20'-0" horizontally.
  - 2. Limit variations from theoretical locations: 1/4 inch for any member at any location.
  - 3. Limit offsets in theoretical end-to-end and edge-to-edge alignment: 1/16 inch from flush surfaces not more than 2 inches apart or out-of-flush by more than 1/4 inch.

END OF SECTION



F. UL - Underwriters Laboratories.

1. UL 10C – Standard for Positive Pressure Fire Tests of Door Assemblies
2. UL 305 – Standard for Panic Hardware

G. WHI - Warnock Hersey Incorporated

H. SDI - Steel Door Institute

### 1.03 SUBMITTALS & SUBSTITUTIONS

A. General: Submit in accordance with Conditions of the Contract and Division 1 Specification sections.

- c. Hand of door(s)
  - d. Door and frame dimensions and door thickness.
  - e. Label requirements if any.
  - f. Door by frame material.
  - g. (Optional) Hardware item line #.
  - h. Keyset Symbol.
  - i. Quantity.
  - j. Product description.
  - k. Product Number.
  - l. Fastenings and other pertinent information.
  - m. Hardware finish codes per ANSI A156.18.
  - n. Manufacture abbreviation.
- D. Make substitution requests in accordance with Division 1. Substitution requests must be made prior to bid date. Include product data and indicate benefit to the project. Furnish samples of any proposed substitution.
- E. Wiring Diagrams: Provide product data and wiring and riser diagrams for all electrical products listed in the Hardware Schedule portion of this section.
- F. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.
- G. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- H. Furnish as-built/as-installed schedule with close-out documents, including keying schedule and transcript, wiring/riser diagrams, manufacturers' installation and adjustment and maintenance information.
- I. Fire Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.
- J. LEED Certification Points: Submit information and certifications necessary to achieve maximum points for LEED certification; coordinate and cooperate with Owner and Architect in providing information necessary for required LEED rating.

#### 1.04 QUALITY ASSURANCE

- A. Obtain each type of hardware (latch and lock sets, hinges, closers, exit devices, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project and that





- C. Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.
- D. Contractor to inventory door hardware jointly with representatives of hardware supplier and hardware installer until each all are satisfied that count is correct.

1.06 WARRANTY

- A. Provide warranties of respective manufacturers' regular terms of sale from day of final acceptance as follows:
  - 1. Locksets: "L" Series (3) years – "ND" Ten (10) years.
  - 2. Electronic: One (1) year.
  - 3. Closers: Thirty (30) years.
  - 4. Exit devices: Three (3) years.
  - 5. All other hardware: Two (2) years.

1.07 MAINTENANCE

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

1.08 PRE-INSTALLATION CONFERENCE

- A. Convene a pre-installation conference at least one week prior to beginning work of this section.
- B. Attendance: Architect, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, Key District Personnel, and Project Inspector.
- C. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work. Review District's keying standards.

2.01 MANUFACTURERS

<u>Item</u>	<u>Manufacturer</u>	<u>Acceptable Substitutes</u>
Hinges	Ives	Hager, Stanley, McKinney
Locks, Latches & Cylinders	Schlage	Or Approved Equal
Exit Devices	Von Duprin	Or Approved Equal
Closers	LCN	Or Approved Equal



- a. Hold open arms or cushion closers are not allowed.
  2. Door closer cylinders shall be of high strength cast iron construction with double heat-treated pinion shaft to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.
  3. All door closers shall be fully hydraulic and have full rack and pinion action with a shaft diameter of a minimum of 11/16 inch and piston diameter of 1 inch to ensure longevity and durability under all closer applications.
  4. All parallel arm closers shall incorporate one-piece solid forged steel arms with bronze bushings. 1-9/16" steel stud shoulder bolts, shall be incorporated in regular arms, hold-open arms, arms with hold open and stop built in. All other closers to have forged steel main arms for strength, durability, and aesthetics for versatility of trim accommodation, high strength and long life.
  5. All parallel arm closers so detailed shall provide advanced backcheck for doors subject to severe abuse or extreme wind conditions. This advanced backcheck shall be located to begin cushioning the opening swing of the door at approximately 45 degrees. The intensity of the backcheck shall be fully adjustable by tamper resistant non-critical screw valve.
  6. Closers shall be installed to permit doors to swing 180 degrees.
  7. All closers shall utilize a stable fluid withstanding temperature range of 120 degrees F. to -30 degrees F. without requiring seasonal adjustment of closer speed to properly close the door.
  8. Provide the manufactures drop plates, brackets and spacers as required at narrow head rails and special frame conditions. NO wood plates or spacers will be allowed. Door frames shall be reinforced at all mounting locations.
  9. Maximum effort to operate closers shall not exceed 5 lbs., such pull or push effort being applied at right angles to hinged doors. Compensating devices or automatic door operators may be utilized to meet the above standards. When fire doors are required, the maximum effort to operate the closer may be increased but shall not exceed 15 lbs. when specifically approved by fire marshal. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. 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. Per 11B- 404.2.8.1, door shall take at least 5 seconds to move from an open position of 90 degrees to a position of 12 degrees from the latch jamb.
- G. Door Stop/Hold Opens: Ives as scheduled.

5. Fabricate either kick, armor, or mop plates with four beveled edges. Provide kick plates 10" high and 2" LDW. Sizes of armor and mop plates shall be listed in the Hardware Schedule. Furnish with machine or wood screws of bronze or stainless to match other hardware.
- N. Keying: Schlage as scheduled.
1. Furnish a Proprietary Schlage master key system as directed by the owner or architect. Key system to be designated and combination-d by the Schlage Master Key Department even if pinned by the Authorized Key Center, Authorized Security Center or a local authorized commercial dealer. This is to be a Schlage Primus keying system. SCUSD to verify all keyways. Provide as follows:
    - a. 6 pin x Standard Core plug (D Series) 626 finish
    - b. 6 pin x Rim type x IC Core (Exit Device) 626 finish
    - c. 6 pin x 1-1/4" Mortise x IC Core (KR Mullions and CD) 626 finish
  2. Match existing cylinder keying with adjacent existing lobby doors.
  4. Furnish all cylinders in the Schlage conventional style except the exit device and removable mullion cylinders which will be supplied in Schlage Full Size Interchangeable Core (FSIC). Pack change keys independently (PKI).
  5. Furnish PrimusXP "Classic" keyway Patent Protected Schlage cylinders where noted. Furnish all other cylinders in matching conventional "Classic" keyway. Furnish Patent Protected Schlage keys for all cylinders. (e.g., Primus XP Classic Keyway for patent protected / Maximum control) (with mix of conventional "Classic" keyway)
  6. Furnish all keys with visual key control.
    - a. Stamp key "Do Not Duplicate".
  7. Furnish mechanical keys as follows:
    - a. Furnish 2 cut change keys for each different change key code.
    - b. Furnish 1 uncut key blank for each change key code.



- J. Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function.
- K. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturer's technical documentation.
- L. Hardware Locations



DOOR NUMBERS – D01, D02

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2 EA	CONT HINGE	224XY EPT	US28	IVE
1 EA	POWER TRANSFER	EPT10	SP28	VON
1 EA	ELEC PANIC	AX-LD-RX-LC-QEL-9847-L	626	VON
1 EA	PANIC	AX-LD-9847-L	626	VON
2 EA	TOP STRIKE	338	BRASS	VON
2 EA	BOTTOM STRIKE	385A	BRASS	VON
2 EA	PRIMUS CORE	AS REQUIRED	626	SCH
2 EA	SURFACE CLOSER	4040XP EDA	689	LCN
2 EA	FLOOR STOP	FS438	626	IVE
2 EA	KICKPLATE	4800 12" X 2" LDW	626	IVE
1 EA	POWER SUPPLY	SEE DIV 28	-	-
1 EA	CARD READER	SEE DIV 28	-	-

DOOR NUMBERS – D08

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1 EA	CONT HINGE	224XY EPT	US28	IVE
1 EA	POWER TRANSFER	EPT10	SP28	VON
1 EA	ELEC PANIC	AX-LD-RX-LC-QEL-9847-L	626	VON
1 EA	PRIMUS CORE	AS REQUIRED	626	SCH
1 EA	SURFACE CLOSER	4040XP EDA	689	LCN
1 EA	FLOOR STOP	FS438	626	IVE
1 EA	KICKPLATE	4800 12" X 2" LDW	626	IVE
1 EA	DOOR SWEEP	328AA	AA	ZER
1 EA	POWER SUPPLY	SEE DIV 28	-	-
1 EA	CARD READER	SEE DIV 28	-	-



DOOR NUMBERS – D09

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1 EA	ELEC PANIC*	AX-LD-RX-LC-QEL-9847-L	626	VON
1 EA	TOP STRIKE	338	BRASS	VON
1 EA	PRIMUS CORE	AS REQUIRED	626	SCH
1 EA	POWER SUPPLY	SEE DIV 28	-	-
1 EA	ARMORED WHIP	SEE DIV 28	-	-
1 EA	CARD READER	SEE DIV 28	-	-

\*On right hand leaf, remove existing panic bar and replace with new. Existing panic bar on left leaf to remain in place. Replace internal rods with new. Install new top strike in existing frame.\*

DOOR NUMBERS – D10

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1 EA	ELECTRIC STRIKE**	6300 SERIES	626	VON
1 EA	PRIMUS CORE	AS REQUIRED	626	SCH
1 EA	POWER SUPPLY	SEE DIV 28	-	-
1 EA	ARMORED WHIP	SEE DIV 28	-	-
1 EA	CARD READER	SEE DIV 28	-	-

\*\*Modify existing frame as required to install new electric strike.\*\*

DOOR NUMBERS – D03, D04

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3 EA	BUTT HINGE	5BB1HW	626	IVE
1 EA	POWER TRANSFER	EPT10	SP28	VON
1 EA	ELEC PANIC	AX-LD-RX-LC-QEL-98-L	626	VON
2 EA	PRIMUS CORE	AS REQUIRED	626	SCH
1 EA	SURFACE CLOSER	4040XP EDA	689	LCN

GATE NUMBERS – G01

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1	EA	HINGE/CLOSER	SEE 32 31 19	--	--
1	EA	PANIC	AX-LD-98-NL	626	VON
1	EA	ELECT SURFACE STRIKE	6300 SERIES (SEE DIV 28)	626	VON
1	EA	PRIMUS CORE	20-740-XP	626	SCH
1	EA	FLOOR STOP	FS18S	BLK	IVE
1	EA	POWER SUPPLY	SEE DIV 28	-	-
1	EA	CARD READER	SEE DIV 28	-	-

END OF SECTION

SECTION 08 80 00  
GLAZING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special handling or installation requirements. Identify available colors.
- D. Samples: Submit two samples, 12x12 inch in size, illustrating glass.
- E. Samples: Submit 3 inch long bead of glazing sealant, color as selected.

#### 1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with FGMA Glazing Manual, FGMA Sealant Manual for glazing installation methods.
- B. Installer's Qualifications: The installation shall be performed only by an installation firm normally engaged in this business. All work shall be performed by qualified mechanics who specialize in glazing and glass installation.
- C. Safety glazing shall be identified in accordance with Section 2406.2, 2016 C.B.C., Title 24, Part 2 with identification etched in glass.

#### 1.06 ENVIRONMENTAL REQUIREMENTS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 48 hours after installation of glazing compounds.

#### 1.07 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop Drawings.

#### 1.08 COORDINATION

- A. Coordinate Work with glazing frames, wall openings, and adjacent Work.

### PART 2 – PRODUCTS

#### 2.01 GENERAL

- A. All Glass shall be graded and meet requirements of ASTM C1036. Each light of glass delivered and installed shall have affixed thereto the manufacturer's grade label.

#### 2.02 GLASS TYPES

- A. Type 1/4CL: Laminated 7/32" glass with .030 inch interlayer. Clear.





- C. Remove labels after work is complete.
- D. Clean glass.

3.05 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 00 72 00.
- B. Replacement: At completion of building construction and prior to its acceptance, all broken, cracked, excessively scratched, or otherwise imperfect glazing materials included under this Section shall be replaced with new glazing materials of the type specified, as directed by the Architect, and at no additional cost to the Owner.

END OF SECTION

SECTION 09 29 00  
GYPSUM BOARD

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. Gypsum board.
- B. Taped and sanded joint treatment.
- C. Accessories.

1.02 RELATED WORK

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 05 40 00: Cold-Formed Metal Framing.
- C. Section 06 06 60: Translucent Resin Panel System.
- C. Section 07 90 00: Joint Sealants.
- F. Section 09 90 00: Painting.

1.03 REFERENCES

- A. ANSI/ASTM C1396 / C1396M-14a - Gypsum Wallboard.
- B. ANSI/ASTM C514-04(2014) - Nails for the Application of Gypsum Wallboard.
- C. ANSI/ASTM C630/C630M-03 - Water Resistant Gypsum Backing Board.
- D. Gypsum Association GA 216 - Application and Finishing of Gypsum Board Products.
- E. ASTM C645-14e1 - Non-Load Bearing (Axial) Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
- F. ASTM C840-16 - Application and Finishing of Gypsum Board.
- G. ASTM C955-15e1 - Load Bearing (Transverse and Axial) Steel Studs, Runners (Track) and Bracing or Bridging, for Screw Application of Gypsum Board.
- H. ASTM C1002-14 - Steel Drill Screws for the Application of Gypsum Wallboard.
- I. ASTM C1047-14a - Accessories for Gypsum Wallboard and Gypsum Veneer Base.

1.04 QUALITY ASSURANCE



- A. Applicator: Company specializing in gypsum board systems work with minimum five years experience.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING





- I. Contractor shall provide new mud ring extensions for all electrical switch and outlets to allow device to flush with face of new gypsum board surface.
- J. At all locations where gypsum board extends past bottom sill plate and contacts face of curb, apply Durabond product to back side of gypsum board per manufacturer's recommendations to secure to face of concrete curb. Provide moderate pressure and temporary nailing or shoring to ensure adequate bond.

### 3.04 JOINT TREATMENT AND FINISH TEXTURE

- A. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
- B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.
- C. All spaces not further identified below which are scheduled to receive finish painting shall be finished to Level 5 as described by the USG Corporation and receive a spray applied, LIGHT orange peel texture. Texture shall be light, tight and uniform.
- E. All hard lid gypsum wallboard ceilings shall be finished to Level 5.
- G. All exposed gypsum board surfaces and surfaces behind Fiber Reinforced Laminate (FRL) wall coverings shall be finished to Level 5 as described by the USG Corporation with no texture. A spray applied primer surfacer is not acceptable as an alternative to providing required levels of troweled compound and thorough sanding. Poor wall finish will telegraph through FRL.

### 3.05 TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

### 3.06 ADJUST AND CLEAN

- A. Cleaning and Repair: Clean surfaces that have been spotted or soiled during wallboard application. Contractor shall clean all light fixture lenses, fire alarm devices, electrical outlets, as performing work.
- B. Defective Work: Remove and replace defective work which cannot be satisfactorily repaired, at the direction of the Architect, with no additional cost to the Owner.
- C. Protection: Protect installed work against damage from other construction work.

### 3.07 CLEAN-UP

- A. Upon completion of the work under this Section, remove all surplus material, rubbish and debris from the premises and leave floors "broom clean".

END OF SECTION

SECTION 09 51 00  
ACOUSTICAL CEILINGS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Lay-in acoustical ceiling systems and metal suspension system.

- J. ASTM E580 – Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
- K. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.
- L. ASTM E1414 - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
- M. ASTM E1477 - Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- N. ASCE 7 - Minimum Design Loads for Buildings and Other Structures, as amended by CBC 1615A.1.16.
- O. CHPS Low-Emitting Materials Table: Materials submitted must be listed as low emitting on the CHPS website, [www.CHPS.net](http://www.CHPS.net).

#### 1.03 SUBMITTALS

##### A. Samples:

1. Lay in panels of each specified type, 6-inch by 6-inch minimum size.
2. Suspension System: 12-inch-long samples of suspension system members, connections, moldings and wall angles, for each color specified.

##### B. Shop Drawings:

1. Indicate complete plan layouts and installation details.
2. Indicate related Work of other sections which is installed in, attached to, or penetrates ceiling areas, such as air distribution and electrical devices.

##### C. Product Data:

1. Suspension System for Lay-in Ceiling: Printed data for suspension system components, including load tests, indicating conformance to specified tests and standards.
2. Acoustical units: Printed data indicating conformance to specified tests and standards.

- D. Maintenance Materials: Provide extra panels equal to 1 percent of the area of each typical module size of acoustical panel, but not less than eight (8) of each specified size, style and color.

#### 1.04 QUALITY ASSURANCE

- A. Ceiling systems shall consist of lay-in acoustical ceiling panels by a single manufacturer and suspension systems by a single manufacturer for the entire project.
- B. Qualifications of Installer: Minimum five (5) years' experience in installing acoustical ceiling systems of the types specified.

C. Design Criteria:

1. Deflection of finished surface to 1/360 of span or less.
2. 1/8-inch maximum permissible variation from true plane measured from 10-foot straightedge placed on surface of finished acoustical fiber units.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the Project site in original sealed packages.
- B. Storage: Store materials in building area where they will be installed, in original package. Keep clean and free from damage due to water or deteriorating elements.
- C. Handle in a manner to prevent damage during storage and installation.

1.06 PROJECT CONDITIONS

- A. Installation of acoustical ceiling system shall not begin until the building is enclosed, permanent heating and cooling is in operation, and residual moisture from plaster and concrete work has dissipated. Building areas to receive ceilings shall be free of construction dust and debris.
- B. Environmental Requirements: Maintain temperature in space at 55 degrees F or above.



D. Or Approved Equal.

## 2.02 SUSPENSION SYSTEM

- A. Metal suspension system for acoustical lay-in tile shall be hot-dipped galvanized steel conforming to ASTM A653. Main beams and cross tees shall be double-web steel construction with exposed flange design, with factory punched cross tee slots, hanger holes and integral couplings.
- B. Metal suspension system for acoustical lay-in tile shall conform with ASTM C635, C636 and E580 and section 13.5.6 of ASCE 7, as amended by CBC Section 1615A.1.16, for installation in high seismic areas.
- C. Structural classification of suspension systems shall be heavy-duty in conformance to ASTM C635.
- D. Vertical Strut: USG Donn Compression Post, or equal, or as indicated; types and designs complying with requirements of authorities having jurisdiction and seismic Zones D, E and F requirements. Provide base attachment clip for connection of vertical strut to main beams.
- E. Wall Molding: Fabricated from galvanized steel with 2-inch horizontal leg and hemmed edges, same finish as main and cross tees.
- F. Spacer/Stabilizer Bars: Provide for tying together the ends of main runners and cross tees that are not attached to wall molding.
- G. Hanger Wire: 0.106-inch diameter (0.144-inch diameter for pendant fixtures), galvanized soft annealed mild steel wire as defined in ASTM A641, Class 1 coating.
- H. Provide attachment devices and any other required accessories for a complete suspended ceiling system installation.

## 2.03 ACOUSTICAL CEILING PANELS

- A. Acoustical ceiling panels shall be class A in accordance to ASTM E1264.
- B. Acoustical panels shall meet the following surface-burning characteristics when tested in accordance to ASTM E84 for Class A materials:
  - 1. Maximum Flame Spread: 25.
  - 2. Maximum Smoke Developed: 50.
- C. Mold and Mildew Resistance: Panels and faces shall be treated with a biocide paint additive or an antimicrobial solution to inhibit mold and mildew.

## 2.04 CEILING TYPES

- A. Entry Lobby

1. Acoustical Ceiling Panels:

- a. Panel Name: Armstrong #1717 Fine Fissured High NRC, or equal.
- b. Panel Size: 2-foot by 2-foot.
- c. Panel Thickness: 3/4 inch.
- d. Edge Detail: Tegular.
- e. Light Reflectance: 0.82 minimum, complying with ASTM E1477.
- f. CAC: Minimum 40, UL Classified, complying with ASTM E1414.
- g. NRC: Minimum 0.70, UL Classified, complying with ASTM C423.
- h. Color: White.
- i. Recycled Content: Per Manufacturer.

2. Suspension System:

- a. Suspension System Name: Prelude XL by Armstrong, Donn DX by USG, 1200 Seismic Series by Chicago Metallic Corporation, or equal.
- b. Color: White.

2.05 CEILING ACCESS PANEL

- A. Non-rated, 24"x48", flush mounted, .063 inch thick aluminum access panel with continuous piano

2. System shall be complete; with joints neatly and tightly joined and securely fastened; suspension members shall be installed in a true, flat, level plane.
3. Hanger Wires: 0.106-inch diameter minimum; larger sizes as indicated or required.
  - a. Fasten wires to panel points and structure above per most stringent requirements of

- a. To Metal Deck or Steel Framing Members: Install as required by current code.
  - b. To Suspension Members: Insert through holes in members or supporting clips.
  - c. Wires shall be fastened with three (3) tight turns minimum for hanger wires and four (4) tight turns minimum bracing wires. Turns shall be made in a 1 ½-inch maximum distance.
- B. Suspension System for 2-foot by 2-foot Lay-in Acoustical Ceilings:
1. Main Runners: Install main runners 48 inches apart; 0.106-inch diameter hanger wires space 48 inches on center maximum along runners, and within 8 inches of ends.
  2. Install wall moldings with fasteners to studs. Install corner caps at molding intersections.
  3. Cross Tees: Install between main runners in a repetitive pattern of 2-foot spacings.
  4. Sub-Tees: Install at edges of penetrations.
- C. Acoustical Panels
1. Install panels into suspension system. Partial panels shall be neatly cut and fitted to suspension and around penetrations and/or obstructions. Duplicate tegular edges at partial panels; cuts to be straight. Repaint cut tiles to match color or as directed by manufacturer for mylar facing at visually exposed conditions or as required by the Architect.
  2. Penetrations through the ceilings for sprinkler heads and other similar devices that are not integrally tied to the ceiling system in the lateral direction shall have a 2-inch oversized ring, sleeve or adapter through the ceiling tile to allow free movement of 1 inch in horizontal directions. Alternatively, per ASTM E580, a flexible sprinkler hose fitting that can accommodate 1 inch of ceiling movement shall be permitted to be used in lieu of the oversized ring, sleeve or adapter.
- D. Air Distribution Devices
1. Refer to and coordinate with Division 23 - HVAC.
  2. Install air distribution grilles and other devices into suspension system. Install 4 taut wires, each 0.106-inch diameter minimum, to each device within 3 inches of device corners, to support their weight independent of the suspension system.
- E. Light Fixtures
1. Refer to and coordinate with Division 26 - Electrical.
  2. Fixtures weighing less than 56 pounds: Install fixtures into suspension systems and fasten earthquake clips to suspension members. Install minimum 2 slack safety wires, each 0.106 inch diameter minimum, to each fixture at diagonally opposite corners, to support their weight independent of the system.
  3. Fixtures weighing 56 pounds or more: Install fixtures into suspension system and fasten earthquake clips to suspension system members as required by the Drawings and/or code. Install not less than 4 taut 0.106-inch diameter wires capable of supporting four (4) times the fixture load.
  4. 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. Brace the pendant-mounted light fixtures by either a bracing assembly at the ceiling penetration or below the ceiling to the walls, as indicated in the drawings.

### 3.03 CLEANING

- A. General: After installation of acoustical material has been completed, clean surfaces of the material, removing any dirt or discolorations. Replace panels as required.
- B. Acoustical Panels: Minor abraded spots and cut edges shall be touched up with the same paint as was used for factory applied finish of the lay-in panels.
- C. Remove and replace work that cannot be successfully cleaned and repaired to eliminate evidence of damage.
- D. Remove rubbish, debris, and waste materials and legally dispose of off of the Project site.

### 3.04 PROTECTION

1.01 SECTION INCLUDES

- A. Factory-wrapped vinyl covered tackable wall panels.

1.02 RELATED SECTIONS

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 09 29 00: Gypsum Board Systems.

1.03 SAMPLE

- A. Submit a sample of each type and color to be installed for the architect's approval.

1.04 CERTIFICATE OF COMPLIANCE

- A. Submit manufacturer's certification that wallcovering furnished meets or exceeds the architect specification requirements.

1.05 WARRANTIES

- A. Furnish a written warranty against defective workmanship that may develop within one (1) year from date of installation and 5 years against manufacturing defects.

1.06 PRODUCT DELIVERY STORAGE AND HANDLING

- A. Deliver vinyl wallcovering and adhesive to the job site in unbroken or undamaged containers and clearly marked with the supplier's identification label. Store vinyl wall coverings in a flat position to avoid damage to roll ends. Store materials in a clean, dry storage area with temperature maintained above 55 F with normal humidity. DO NOT CROSS STACK THIS MATERIAL.

1.07 PROJECT CONDITIONS

- A. Areas where wallcovering will be installed shall have a constant minimum temperature of not less than 60 degrees F for at least seven days prior to and throughout installation period and for seven days thereafter.

VINYL WRAPPED TACK PANELS  
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installed according to manufacturer's specifications. Evidence of the Early Warning Effect shall be based on the ASTM E603-07 standards guide for room fire experiments.

2.05 PROTECTIVE COATING

- A. The vinyl wallcovering shall have a protective coating applied to its surface to minimize migration of stains into the vinyl and, therefore, offer stain protection from a variety of staining agents and provide greater ease of clean ability.

2.06 ADHESIVE

- A. The adhesive used must be manufacturer's recommended adhesive and must contain mildew inhibitors. When applied to 5/8" Type-X gypsum board, A-848-B adhesive is recommended by manufacturer.

2.07 PRIMERS

- A. The primer used must be manufacturer's recommended primer.

2.08 TACKABLE PANEL SUBSTRATE

- A. Tackable Panels: Where indicated on the Drawings, vinyl shall be installed over tackable substrate. Tackboard substrate shall be industrial insulation board 1/2", equal to Homasote, by full height of wall or as otherwise indicated on the drawings, and shall be manufactured specifically as a substrate for vinyl covered wall panels.
- B. The board shall be asphalt free, shall have an ironed-on coating, and have a density of 16 pounds per cubic foot.
- C. Edges are square without bevel.
- D. The vinyl wallcovering shall be mechanically laminated, with the long edges wrapped to the back of the tackboard. The vinyl covered tackboard shall be a Class II flame spread rating.

2.09 EDGE TRIM

- A. Provide color-matched PVC J-mold edge trim at all exposed exterior edges.

2.10 GYPSUM BOARD FINISH

- A. The recommended finish level before commercial-grade wall covering is applied for final decoration is Level 4. The prepared surface shall be coated with a drywall primer prior to the application of final finishes. See 2.07 Primers.
- B. At locations to be covered by a tackable panel substrate, the gypsum board finish shall be Level 2.



3.01 INSPECTION

- A. Installer shall inspect all areas and conditions under which vinyl wallcoverings are to be installed. Installer shall notify the contractor and architect in writing of any conditions detrimental to the proper and timely completion of the installation; work will proceed only when conditions have been corrected and accepted by the installer.
- B. Substrate shall be checked with a suitable "Moisture Meter." Moisture shall not exceed 4%.

3.02 SURFACE PREPARATION

- A. Wall surfaces shall be free from defects and imperfections that could show through the finished covered surface.
- B. For new drywall construction, manufacturer recommended primer should be used before application of wallcovering for ease of future removal when redecorating.
- C. All painted surfaces should be evaluated for the possibility of pigment bleed-through. If there is any possibility, a coat of sealer, recommended by the manufacturer, should be applied before application of the wallcovering.

3.03 INSTALLATION

- A. Wallcovering shall be installed by experienced workers and contractors in strict accordance with the manufacturer's oriented instructions using vinyl wallcovering adhesive recommended by the manufacturer (WHEAT PASTE SHALL NOT BE USED). It is absolutely imperative that installer read the manufacturer's instruction sheet in each roll before installing the vinyl wallcovering. Permanent building light shall be available for installation.
- B. Installer before cutting shall examine pattern and color and determine that they are the correct pattern and color as specified.
- C. Installer shall install each roll in sequence starting with largest roll number and each

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SECTION 09 91 00  
PAINTING

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Surface preparation and field painting of exposed interior items and surfaces, including mechanical and electrical equipment that do not have a factory-applied finish.

1.2 RELATED SECTIONS

- A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
- B. Section 09 29 00 - Gypsum Board Assemblies: Surface preparation of gypsum board.
- C. Division 26: Electrical.

1.3 REFERENCES

analysis and instructions for handling, storing, and applying each coating material.

- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.
- C. Paint Exposed Surfaces: If an item or a surface is not specifically mentioned, paint the item, or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
- D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
- E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label:
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.
- C. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- D. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C), unless manufacturer's instructions specifically states.
- E. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F (7 and 35 deg C).
- F. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
  - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

## 1.8 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the materials applied and, in the quantities, described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
- B. Quantity: Furnish Owner with an additional three percent, but not less than 1 gal (3.8 l) or 1 case, as appropriate, of each material and color applied.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Dunn Edwards Paints.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 25 13.

### 2.2 PAINT MATERIALS - GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. VOC Classification: Provide materials, including primers, undercoats, and finish-coat materials, which meet local air quality management district regulations.
- C. Color: Refer to Finish Schedule and Paint Legend for paint colors.
- D. Application Rate: Coating thickness for primer, intermediate, barrier and finish coats shall be measured as Dry Film Thickness (DFT) and comply with manufacturer's published recommendations.

### 2.3 Interior Paint Systems

- A. Gypsum and Plaster Walls:
  - a. Prime Coat: DE Ultra – Grip Acrylic Premium Primer
  - b. 2<sup>nd</sup> Coat: DE Spartawall Acrylic Low VOC Eggshell Enamel
  - c. 3<sup>rd</sup> Coat: DE Spartawall Acrylic Low VOC Eggshell Enamel
- ~~B. Suspended and Surface applied Ceilings:
  - a. Prime Coat: DE Ultra – Grip Acrylic Premium Primer
  - b. 2<sup>nd</sup> Coat: DE Ceiling Paint Flat Finish
  - c. 3<sup>rd</sup> Coat: DE Ceiling Paint Flat Finish~~
- ~~C. Wood Doors & Frames (Painted Finish):
  - a. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
  - b. 2<sup>nd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
  - c. 3<sup>rd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel~~
- ~~D. Previously Painted Wood:
  - a. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
  - b. 2<sup>nd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
  - c. 3<sup>rd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel~~
- ~~E. Wood Previously Stained to be Painted:
  - a. Prime Coat: DE Ultra – Grip Acrylic Premium Primer~~

- b. 2<sup>nd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
- c. 3<sup>rd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

- F. Wood to be re-finished and sealed:
  - a. 2 Coats: Old Masters Master Armor Satin Finish

- G. Metal Doors and Frames:
  - a. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
  - b. 2<sup>nd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
  - c. 3<sup>rd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

- H. Vinyl Tackable wall Panels:
  - a. Prime Coat: Zinsser B-I-N Shellac Base Primer
  - b. 2<sup>nd</sup> Coat: DE Spartawall Acrylic Low VOC Eggshell Enamel
  - c. 3<sup>rd</sup> Coat: DE Spartawall Acrylic Low VOC Eggshell Enamel

## 2.4 Exterior Paint Systems

- A. Concrete Substrates, Masonry, Stucco, Non-Traffic Surfaces:
  - a. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
  - b. 2<sup>nd</sup> Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish
  - c. 3<sup>rd</sup> Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish

### Wood Siding:

- a. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
- b. 2<sup>nd</sup> Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish
- c. 3<sup>rd</sup> Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish

### Wood Fascia:

- a. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
- b. 2<sup>nd</sup> Coat: DE Spartashield 100% Acrylic Exterior Semi-Gloss Finish
- c. 3<sup>rd</sup> Coat: DE Spartashield 100% Acrylic Exterior Semi-Gloss Finish

### Wood Benches:

- a. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
- b. 2<sup>nd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
- c. 3<sup>rd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

- E. Interior & Exterior Surfaces of Exterior Doors:
  - a. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
  - b. 2<sup>nd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
  - c. 3<sup>rd</sup> Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel



- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
  - 1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.
  - 2. If a potential incompatibility of primers applied by others exists, obtain the following from the primer Applicator before proceeding:
    - a. Confirmation of primer's suitability for expected service conditions.
    - b. Confirmation of primer's ability to be top coated with materials specified.

### 3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
  - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
  - 1. Provide barrier coats over incompatible primers or remove and reprime.
  - 2. Provide barrier coats over incompatible primers or remove primers and reprime substrate.
  - 3. Cementitious Substrates: Prepare concrete, brick, concrete masonry block, and cement plaster surfaces to be coated. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to dull surfaces. If hardeners or sealers have been used to improve curing, use mechanical methods to prepare surfaces.
    - a. Use abrasive blast-cleaning methods if recommended by coating manufacturer.
    - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not coat surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
  - 4. Wood Substrates: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Smoothly sand surfaces exposed to view and dust off.
    - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer, before applying primer.
    - b. Immediately on delivery, prime edges, ends, faces, undersides, and backsides of wood to be coated.
    - c. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    - d. Determine moisture content of surfaces by performing a moisture test. Do not coat if moisture content exceeds 15 percent.
  - 5. Ferrous-Metal Substrates: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC



recommendations.

- a. Blast-clean steel surfaces as recommended by coating manufacturer and according to SSPC-SP 10.
  - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
  - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire brush, solvent clean, and touch up with same primer as the shop coat.
6. Nonferrous-Metal Substrates: Clean nonferrous and galvanized surfaces according to manufacturer's written instructions for the type of service, metal substrate, and application required.
- a. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Material Preparation: Carefully mix and prepare coating materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying coatings in a clean condition, free of foreign materials and residue.
  2. Stir materials before applying to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into the material. Remove film and, if necessary, strain coating material before using.
  3. Use only the type of thinners approved by manufacturer and only within recommended limits.
  4. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.

### 3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. General: Apply high-performance coatings according to manufacturer's written instructions.
1. Use applicators and techniques best suited for the material being applied.
  2. Do not apply high-performance coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
  3. Coating surface treatments, and finishes are indicated in the coating system descriptions.
  4. Provide finish coats compatible with primers used.
  5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convactor covers, grilles, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
- C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. The number of coats and film thickness required is the same regardless of application method.
  2. Completed Work: Match approved Samples for color, texture, and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.

### 3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:
1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed,

- and certified in the presence of Contractor.
2. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove non-complying

## 1.01 SECTION INCLUDES:

- A. Provide and install specialty and built-in items as indicated on the Drawings and specified here.
  - 1. Resilient Base.
- B. Provide miscellaneous, and incidental items under the work of this section for all items indicated on the Drawings but not specifically addressed in other sections or not necessarily scheduled herein.

## 1.02 RELATED SECTIONS:

- A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

## 1.03 STANDARDS:

- A. Individual items or assemblies scheduled or as indicated on the Drawings, shall conform to respective industry and governmental standards.

## 1.04 QUALITY ASSURANCE:

- A. Installation of items or assemblies shall be 1(l b2B fAl)-1(7 Q q 152 Unelo )-1(torodu)-1g Q hlytrainted an

## 1.53 UBMITTALSE:



- A. Keep building and premises free from accumulated waste materials, rubbish and debris resulting from Work herein. Upon completion of work, remove tools, appliances, surplus materials, waste materials, rubbish, debris, and accessory items used in or resulting from installation, and legally dispose of off-site.

3.05 SCHEDULE OF MISCELLANEOUS SPECIALTIES:

- A. \_\_\_\_\_ Cove style, conforming to ASTM F 1861 or FS-SS-W-40, Type 1. 6 inch high and 1/8-inch (3.2mm) gauge. No manufactured corners.

END OF SECTION 10 00 00

SECTION 10 14 00  
SIGNAGE

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Provision and installation of interior and exterior room and building identification signs,

- C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless-Steel Sheet, Strip, Plate, and Flat Bar.

### 1.03 SUBMITTALS

- A. General: Submit in accordance with Conditions of the Contract and Division 1 Specification sections.
- B. Shop drawings listing sign types using the same sign type designations identified in the SIGNAGE SCHEDULES in this Section, lettering and locations and overall dimensions of each sign.
- C. Two (2) samples of typical room identification sign illustrating full size sample sign with tactile characters, Braille and subsurface text or pictogram to demonstrate fabrication technique and Braille measurements which shall be used on proposed project.
- D. Submit manufacturer's technical data and installation for each type of sign required.
- E. Submit samples of background colors, character colors, and one-inch high print outs of "I," "O" and "X" from proposed type styles. Indicate which type styles shall be used for required tactile characters and for required visual characters.
- F. Submit proposed sign schedule to comply with scoping requirements above and clearly identifying all sign types, locations and text. Architect will assist in clarifying room names at time of submittal.
  - 1. Sign type designations in submittal must match those in the SIGNAGE SCHEDULE in this Section.
- G. All signage shall be designed and constructed to comply with signage specifications and drawings.

### 1.04 QUALITY ASSURANCE

- A. Manufacturers shall have a minimum of five (5) years of documented experience in fabricating and installing both tactile and non-tactile signs and lettering required by this section.
  - 1. Manufacturer's Two-Year Warranties.
- B. Contractor shall provide labor and materials to repair or replace defective signs as directed by Owner during warranty period. Defects shall include:
  - 1. Tactile characters and/or Braille dots which come off or are easily removed.
  - 2. Discoloration, wear and scratching off of the surface color.
  - 3. All signs and sign components, except for damage by mishandling by Owner, including installation by Owner, or vandalism.

C. Pre-installation Meeting

1. Notify Architect when signs are ready for installation. Arrange for conference at job 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.
- B. Manufacturers shall submit 3 references showing products for projects completed within the last 6 years. Both tactile and non-tactile signage shall be included in the work.
- C. Manufacture's Two-Year Warranties.
- D. Contractor shall provide labor and materials to repair or replace defective signs as directed by Owner. Defects shall include:
  1. Tactile characters and/or Braille dots which come off or are removed.
  2. Discoloration, wear and scratching off of the surface color.
  3. All signs and sign components, except for damage by mishandling by Owner, including installation by Owner, or vandalism.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Products of following manufacturers form basis for design and quality intended.
  1. Gravotech. [www.gravotech.com](http://www.gravotech.com)
  2. Or approved equal with direct compatibility with District-owned Gravotech engraving equipment and surplus engraving materials for sign types specified as "Modular".

2.02 MATERIALS

- A. Modular Acrylic Framed Signs (Sign Types S-1 & S-3 per Signage Schedule below):
  1. Modular sign panels mounted in permanently fixed frames with sign panels capable of being removed and replaced.
  2. ADA Tactile and Braille Signs: Sand-Carved signs; thermosetting high-pressure laminate using Graphic Process Sand-Carved signs, exterior-grade, graphics, Braille and tactile copy required. Square corners, square cut edges, matt finish using Gravotac sheet engraving materials as manufactured by Gravotech.



- a. Frame: Single-piece, square-edge modular plastic frames with concealed screw mounting by Gravotech. Color as selected by Architect at time of submittal.
- b. ADA TactManufacturer's standard process for producing copy complying with CBC and ADA Accessibility Guidelines. Text shall be accompanied by California Grade 2 Braille. Produce precisely formed characters with square cut edges free from burrs and cut marks, permanently fused to substrate.
- c. Raised-Copy Thickness: Not less than 1/32 inch.

~~B. Non-Tactile, Non-Modular Signs (Sign Types S-4 & S-5 per Signage Schedule below):~~

- ~~1. Cast Acrylic Plastic Sheet; ASTM D4802 Category A-1, 1/4 inch overall thickness, laminated acrylic plastic sheets, sub-surface screened process graphics and symbols, exterior-grade at exterior locations, square 3/8-inch radius corners, square cut edge, drilled holes for countersunk screws, polished edges.~~

- a. ~~Exception: Parking, traffic signs, and exterior safety signs may use reflective materials. Identification signs for accessible parking spaces shall use reflective materials for graphics.~~

3. ~~Accessible Parking Stall Sign (See Drawings for locations):~~

- a. ~~Fabricate with metal panel for each accessible parking stall as indicated on the Drawings. The sign shall display the International Symbol of Accessibility (reflectorized); text shall occur below the symbol and read "MINIMUM FINE \$250". The bottom of the regular accessible stall sign shall be mounted 80" above the finish grade. Color shall be white text on blue field. See Drawings for additional information.~~

4. ~~Van Accessible Parking Stall Sign (See Drawings for locations):~~

- a. ~~Same as "Accessible Parking Stall Sign" described above. Install above new "Van Accessible"~~

2. Raised tactile characters shall be raised 1/32 inch minimum and shall be San Serif uppercase and lowercase characters and numerals accompanied by corresponding California Grade 2 Contract



to read. "EXIT ROUTE".

~~F. Type S-4, ASSISTIVE LISTENING DEVICE:~~

- ~~1. Acrylic polymer sign panel fabricated per regulatory requirements identified in this section.~~

~~G. Type S-5, OCCUPANT LOAD:~~

- ~~1. Acrylic polymer sign panel fabricated per regulatory requirements identified in this section. See Drawings for individual occupant load information at each sign location.~~

~~H. Type S-6, DOOR AND GLASS APPLIED DECAL LETTERS:~~

- ~~1. Vinyl transfer letters equal to those as custom fabricated by:~~

~~—— Signature Graphics  
—— 620 Sunbeam Ave.  
—— Sacramento, CA 95811  
—— Contact: Shane Duncan (916) 454-0800~~

- ~~2. Provide single color heavy duty, self-adhesive, UV resistant, cut vinyl letters where indicated on the drawings.~~
- ~~3. Text to be 3 inches tall and shall read as follows:~~
  - ~~a. FIRE RISER—Door mounted at all fire riser rooms and mounted on exterior of door.~~
  - ~~b. OFFICE—Transom glass mounted. Mount on inside face of glass to be read from outside.~~

~~Font to be Calibri and color to be selected by Architect at time of submittal from manufacturer's~~



F. Clean and polish.

3.02 ADJUST AND CLEAN

- A. Clean and Touch-up: Remove all packing and protection blemishes and thoroughly clean and polish all finish surfaces. Restore any marred or abraded surfaces to their original condition by touching up in accordance with the manufacturer's recommendations. Touch-up shall not be obvious.
- B. Defective Work: Remove and replace all defective work which cannot be properly repaired, cleaned or touched-up with no additional cost to the owner.
- C. Protect installed work during the construction period to prevent abuse and damage.

3.03 CLEAN-UP

- A. Upon completion of the work of this section, remove all surplus materials, rubbish and debris from the premises.



SECTION 10 26 00  
WALL PROTECTION - CORNER GUARDS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Provide all vertical corner guards complete and in places as shown on the Drawings, specified here, and needed for a complete and proper installation.

1.02 RELATED SECTIONS

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 09 29 00: Gypsum Board.

1.03 QUALITY ASSURANCE

- A. For installation of corner guards, use only personnel skilled in the work required, completely familiar with the manufacturer's recommended methods of installation, and thoroughly familiar with the requirements of this work.
- B. Catalog Standards:
  - 1. Manufacturer's catalog numbers may be shown on Drawings for convenience in identifying specified items. Unless modified by notation on Drawings or specified, catalog description for indicated number constitutes requirements for the item specified.
  - 2. The use of catalog numbers and specific requirements set forth in Drawings and Specifications does not preclude use of any other manufacturer's products or procedures which may be equivalent. Such numbers and requirements establish standards of design and quality for materials, construction, and workmanship.

1.04 SUBMITTALS

- A. Submit per the requirements of Division 0, General Conditions:



3. Use liberal amount of construction adhesive per manufacturer's written instructions. Mask adjacent surfaces to avoid squeeze-out damage from excess adhesive.
4. Press corner guard into sealant to fully seat.
5. Remove any squeeze-out immediately for a clean installation.
6. Temporarily secure in place until adhesive is full cured.

3.04 CLEANING

- A. Upon completion, remove manufacturer's temporary labels, marks of identification. Thoroughly wash surfaces and remove foreign material. Leave entire work in neat, orderly, clean and acceptable condition as approved. Replace damaged parts and imperfect surfaces.

3.05 PROTECTION

- A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades.
- B. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.
- C. In the event of damage, immediately make all repairs and replacements necessary to the satisfaction of the Architect and at no additional cost to the Owner.

END OF SECTION 10 26 00





1. Electric motors.
2. Package mechanical equipment: fans, fan coil units, pumps, boilers, compressors, etc.
3. Pre-wired electrified partition furniture.
4. Electric signage.
5. Projection screens.

## 1.02 QUALITY ASSURANCE

- A. Reference to Codes, Standards, Specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to submittal of the bid. Such codes or standards shall be considered a part of this Specification as though fully repeated herein.
- B. When codes, standards, regulations, etc. allow Work of lesser quality or extent than is specified under this Division, nothing in said codes shall be construed or inferred authority for reducing the quality, requirements, or extent of the Contract Documents. The Contract Documents address the minimum requirements for construction.
- C. Work shall be performed in accordance with all applicable requirements of the latest edition of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:

1. California Electric Code (CEC).
2. California Building Code (CBC).
3. California Fire Code (CFC).
4. California Mechanical Code (CMC).

- D. Standards: Equipment and materials specified under this Division shall conform to the following standards where applicable:

ACI	American Concrete Institute
ANSI	American National Standards Institute
ASTM	American Society for Testing Materials
CBM	Certified Ballast Manufacturers
ETL	Electrical Testing Laboratories
FS	Federal Specification
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IPCEA	Insulated Power Cable Engineer Association
NEMA	National Electrical Manufacturer's Association
UL	Underwriters' Laboratories

- E. Independent Testing Agency qualifications:

1. Testing Agency shall be an independent testing organization that will function as an unbiased authority, professionally independent of Manufacturer, Supplier and Contractor, furnishing and installing equipment or system evaluated by Testing Agency.

- B. Submittals shall consist of detailed Shop Drawings, Specifications, block wiring diagrams, "catalog cuts" and data sheets containing physical and dimensional information, performance data, electrical characteristics, materials used in fabrication and material finish. Clearly indicate by arrows or brackets precisely what is being submitted on and those optional accessories which are included and those which are excluded. Furnish quantities of each submittal as noted in Division 01.
- C. Each submittal shall be labeled with the Specification Section Number and shall be accompanied by a cover letter or shall bear a stamp stating that the submittal has been thoroughly reviewed by the Contractor and is in full compliance with the requirements of the Contract Documents or provide a Specification Section line-by-line compliance response statement with detailed exception/ deviation response statements for all applicable provisions for the applicable Specification Section. Any Specification Section lines without a detailed exception/ deviation response statement shall be treated as the Contractor or Vendor is submitting in full compliance with the applicable Specification Section requirements. Cover letters shall list in full the items and data submitted. Failure to comply with this requirement shall constitute grounds for rejection of data.
- D. The Contractor shall submit detailed Drawings of all electrical equipment rooms and closets if the proposed installation layout differs from the construction documents. Physical size of electrical equipment indicated on the Drawings shall match those of the electrical equipment that is being submitted for review, i.e.: switchboards, panelboards, transformers, control panels, etc. Minimum scale: 1/4" = 1'- 0". Revised electrical equipment layouts must be approved prior to release of order for equipment and prior to installation.
- E. As part of the equipment and fixture submittals, the Contractor shall provide anchorage calculations for floor and wall mounted electrical equipment and fixtures, distribution conduits and raceways, in conformance with the 2019 California Building Code (CBC) and ASCE 7-16. Use the Occupancy Category, Ground Accelerations, Site Class, Seismic Design Category, and Seismic Importance Factor as noted in the structural drawings. For components required for Life Safety or containing hazardous materials use  $I_p=1.5$ . Structural Calculations shall be prepared, stamped, and signed by a California Registered Structural Engineer. Specify proof loads for drilled-in anchors, if used.
- F. The Manufacturer shall recommend the method of anchoring the equipment to the mounting surface and shall provide the Contractor with the assembly dimensions, weights, and approximate centers of gravity.
- G. Review of submittals is for general conformance to design concept and general compliance with the Specification Sections. Submittal Review Comments do not imply waiver of Specifications Section requirements unless specifically noted.



- I. Shop Drawings for the following systems must be prepared via a computer aided drafting (CAD) building information modeling (Revit) system for submission by the Contractor. The Engineer can provide CADRevit files of the electrical Contract Documents to the Contractor.
  - 1. Manufactured wiring system, Section 260519.
  - 2. Fire alarm system, Section 266113.
  - 3. Security system, Section 266513.
  - 4. Telecommunication cabling system, Section 267113.
  
- J. Independent Testing Agency report:
  - 1. Testing Agency shall provide 3 copies of the complete testing report.
  - 2. Test report shall include the following:
    - a. Summary of Project.
    - b. Description of equipment.
    - c. Equipment used to conduct the test.
      - 1) Type.
      - 2) Manufacturer.
      - 3) Model number.
      - 4) Serial number.
      - 5) Date of last calibration.
      - 6) Documentation of calibration leading to NIST standards.
    - d. Description of test.
    - e. Test results, as compared to Manufacturers or industry accepted standards and tolerances.
    - f. Conclusion and recommendation.
    - g. Signature of responsible test organization authority.
  - 3. Furnish completed test report to Engineer no later than 30-days after completion of testing, unless otherwise directed.
  
- K. Substitutions:
  - 1. All requests for substitutions shall conform to the general requirements and procedure outlined in Division 01.

2. Where items are noted as "or equal," a product of equal design, construction and performance will be considered. Contractor must submit to the Engineer all pertinent test data, catalog cuts and product information required substantiating that the product is in fact equal to that specified. Only one substitution will be considered for each product specified.
3. Manufacturers' names and model numbers used in conjunction with materials, processes or equipment included in the Contract Documents are used to establish standards of quality, utility, and appearance. Materials, processes, or equipment, which in the opinion of the Engineer is equal in quality, utility, and appearance, will be approved as substitutions to that specified.
4. Whenever any material, process or equipment is specified in accordance with a Federal specification, an ASTM standard, an ANSI specification, UL rating or other association standard, the Contractor shall present an affidavit from the Manufacturer certifying that the product complies with the particular standard specification. When requested by the Engineer, support test data to substantiate compliance shall be submitted by the Contractor at no additional cost.
5. Substitutions shall be equal, in the opinion of the Architect/Engineer, to the specified product. The burden of proof of such shall rest with the Contractor. When the Architect/Engineer in writing accepts a substitution, it is with the understanding that the Contractor guaranteed the substituted article or material to be equal to the one specified and dimensioned to fit within the construction. Approved substitutions shall not relieve the Contractor of responsibilities for the proper execution of the Work or from any provisions of the Specifications.
6. The Contractor shall be responsible for all expenses in connection with the substitution materials, processes, and equipment, including the effect of the substitution on the Contractor, Subcontractor's, or other Contractor's Work. No substitution of material, processes or equipment shall be permitted without written authorization of the Architect/Engineer. Any assumptions on the acceptability of a proposed substitution prior to acceptance by the Engineer are at the sole risk of the Contractor.

#### 1.05 COORDINATION

##### A. Discrepancies:

1. In the event of discrepancies within the Contract Documents, the Engineer shall be so notified, within sufficient time, as delineated in Division 01, prior to the Bid Opening to allow the issuance of an Addendum.
2. If, in the event that time does not permit notification or clarification of discrepancies prior to the Bid Opening, the following shall apply: The Drawings govern in matters of quantity and the Specifications govern in matters of quality. In the event of conflict within the Drawings involving quantities or within the Specifications involving quantities or within the Specifications involving quality, the greater quantity and higher quality



2. Record Drawings shall be the transfer of information on these prints to the construction documents via computer aided drafting (CAD) building information modeling (Revit) process. A set of Revit files of the electrical construction documents will be provided to the Contractor by the Engineer. For the BIM/clash detection process, a Revit file of the electrical construction documents will be provided to the Contractor by the Engineer, which will represent a LOD of 300 design level. The Contractor is responsible for updating the model with changes as well as taking the model to a LOD of 500 design level.
  3. Record drawing submissions shall be provided to the Engineer to review upon the completion of the following phases of Work:
    - a. All underground installation.
    - b. Building electrical rough-in.
    - c. Final electrical installation.
  4. Include in the record drawing submission the following shop drawing submission with all updated installation information:
    - a. Manufactured wiring system.
  5. A single set of half size prints of the Record Drawings shall be submitted for review. Upon receipt of the Engineer's review comments, corrections shall be made, and the Contractor shall provide the following:
    - a. Two sets of full-size prints.
    - b. Four sets of half-size prints.
    - c. One set of full size reproducibles.
    - d. Electronic files of Drawings in PDF and CADRevit.
- B. Panel schedules:
1. Typewritten panel schedules shall be provided for panelboards indicating the loads served and the correct branch circuit number. Schedules shall be prepared on forms provided by the Manufacturer and inserted in the pocket of the inner door of each panelboard. See Section 262416: Panelboards for requirements.
  2. A single set of the record panel schedules shall be submitted for review. Upon receipt of the Engineer's review comments, corrections shall be made, and the Contractor shall provide the following:
    - a. Fold and insert one copy of the appropriate schedule in the pocket of the inner door of each panelboard.
    - b. Three binders, each containing a full set of the panel schedules. Provide index listing all schedules and dividers for separation of schedules as follows:

1) 277/480V normal.

C. Field labels, markings, and warning signs: Provide in accordance and as required by:

1. General: CEC Article 110.21.
2. Arc-Flash Warning: CEC Article 110.16.
3. Identification of Disconnecting Means: CEC Article 110.22 (A).
4. Available Fault Current: CEC Article 110.24.
5. Depth of Working Space in Existing Buildings: CEC Article 110.26 (A)(1)(c).
6. Guarding of Live Parts: CEC Article 110.27 (C).
7. Locked Rooms or Enclosures: CEC Article 110.34 (C).

#### 1.07 OPERATION AND MAINTENANCE MANUALS

A. Prior to Project closeout furnish to the Owner, six (6) hard back 3-ring binders containing all bulletins, operation and maintenance instructions, part lists, service telephone numbers and other pertinent information as noted in each Section all equipment furnished under Division 26. Binders shall be indexed into Division Sections and labeled for easy reference. Bulletins containing more information than the equipment concerned shall be properly stripped and assembled.

#### 1.08 PROJECT MANAGEMENT AND COORDINATION SERVICES

- A. Overview: Contractor shall provide a Project Manager/Engineer for the duration of the Project to coordinate the Division 26 Work with all other trades. Coordination services, procedures and documentation responsibility shall include, but shall not be limited to the items listed in this Section.
- B. Review of Shop Drawings prepared by other Subcontractors:
1. Obtain copies of all Shop Drawings for equipment provided by others that require electrical service connections or interface with Division 26 Work.
  2. Perform a thorough review of the Shop Drawings to confirm compliance with the service requirements contained in the Division 26 Contract Documents. Document any discrepancy or deviation as follows:
    - a. Prepare memo summarizing the discrepancy.
    - b. Provide a copy of the specific shop drawing, indicating via cloud, the discrepancy.
  3. Prepare and maintain a shop drawing review log indicating the following information:
    - a. Shop drawing number and brief description of the system/material.
    - b. Date of your review.



- b. Labor burden shall be based on rates currently in effect at the time the Work under the change order is being performed and shall include only fringe benefits by governing trade organizations, Federal Insurance Contribution Act, Federal and State Unemployment taxes, payroll taxes and net actual premium paid for public liability, workers' compensation, property damage and other forms of insurance required by the Owner. No other cost will be included as labor burden.
- c. NECA Manual of Labor Units will be utilized as the basis for determining labor productivity rates for Electrical Work as follows:
  - 1) 85% of NECA column 1 (normal) for change in scope issued well in advance of Work needing to be performed, so as not to cause slow-down or Work stoppage.
  - 2) 100% of NECA column 1 (normal) for Work being performed with other Base Contract Work, not out of sequence and with minimal slow-down or Work stoppage.
  - 3) 100% of NECA column 2 (difficult) for Work performed out of sequence,





- c. For Work performed by a Subcontractor shall equal a maximum of 5 percent mark-up for profit. Subcontractor shall follow the same guidelines above for their mark-up allowance. No consideration shall be given for more mark-ups than this two-tier arrangement whereas the mark-up could exceed 20%.
- d. For Work scope changes that result in a net decrease in cost to the Contractor or a Subcontractor, the Owner shall receive a credit based on the actual net decrease in direct cost figured in the same manner as an add cost. It is understood that the mark-up value applied at bid time will not be credited back. Although, if this is a change to a previous change order, then mark-up values shall be included in credit back to Owner.
- e. There will be no mark-ups on the cost of performance bond.

D. Documentation:

1. Project change order request submission:

- a. Provide copies of all take-off sheets showing material and labor charges in line item format.
- b. Provide recap sheet showing all direct costs and mark-ups.
- c. Provide copies of invoices for Subcontracted Work.

2. Allowance account tracking:

- a. Contractor shall prepare and maintain a spreadsheet for each allowance account to track and monitor the requested and approved charges.
- b. Copies of these spreadsheets, along with the summary spreadsheets, shall be submitted to the Owner's Representative twice a month.

3.01 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. All work shall be installed in a neat, workmanlike manner in accordance with ANSI/NECA 1-2015.
- B. Comply with the requirements of all listed codes and standards.
- C. All materials and equipment provided under this contract shall be new (except where otherwise noted) and shall be listed, labeled or certified by a Nationally Recognized Testing Laboratory (NRTL) to meet Underwriters Laboratories, Inc. (UL), standards where test standards have been established. Materials and equipment which are not covered by UL standards will be accepted, providing that materials and equipment are listed, labeled, certified or otherwise determined to meet the safety requirements of a NRTL.

- D. All equipment of the same type and capacity shall be by the same manufacturer.
- E. Where any device or part of equipment is referred to in these specifications in the singular number (e.g., "the switch"), this reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.
- F. During construction the contractor shall at all times maintain electrical utilities of the building without interruption. Should it be necessary to interrupt any electrical service or utility, the contractor shall secure permission in writing from the owner's representative for such Interruption at least ten (10) business days in advance. Any interruption shall be made with minimum amount of inconvenience and any shut-down time shall have to be on a premium time basis and such time to be included in the contractor's bid. Arrange to provide and pay for temporary power source as required by project conditions.
- G. Working clearance around equipment shall not be less than that specified in the CEC for all voltages specified.
- H. The locations of switches, receptacles, lights, motors, etc. outlets shown are approximate. The contractor shall use good judgment in placing the preceding items to eliminate all interference with ducts, piping, etc. The contractor shall check all door swings so that light switches are not located behind doors. Relocate switches as required, with approval from the Design Professional. The owner's representative may direct relocation of outlets before installation, up to five (5) feet from the position indicated on the Drawings, without additional cost.
- I. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity. Normal maintenance shall not require the removal of protective guards from adjacent equipment. Install equipment as close as practical to the locations shown on the Drawings.
  - 1. Where the owner's representative determines that the Contractor has installed equipment not conveniently accessible for operations and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the owner.
  - 2. "Conveniently Accessible" is defined as being capable of being reached without climbing or crawling over or under obstacles such as motors, pumps, belt guards, transformers, racks, piping, ductwork, raceways or similar.
- J. Owner furnished equipment: Equipment furnished by the District shall be received, stored, uncrated, protected, and installed by the Contractor with all appurtenances required to place the equipment in operation, ready for use. The Contractor shall be responsible for the equipment as if he had purchased the equipment himself and shall hold the warranty

### 3.02 ROUGH-IN



11. Provide access panel or doors where devices or equipment are concealed behind

## BASIC ELECTRICAL REQUIREMENTS

- E. Calibration of test equipment:
  - 1. Testing Agency shall have calibration program that assures test instruments are maintained within rated accuracy.
  - 2. Instruments shall be calibrated in accordance with the following frequency schedule:
    - a. Field instruments: Analog, 6-months maximum; Digital, 12-months maximum.
    - b. Laboratory instruments: 12-months.
    - c. Leased specialty equipment: 12-months where accuracy is guaranteed by lessor.
  - 3. Dated calibration labels shall be visible on test equipment.
  - 4. Records, which show date and results of instruments calibrated or tested, must be kept up to date.
  - 5. Up-to-date instrument calibration instructions and procedures shall be maintained for test instrument.
  - 6. Calibration standards shall be of higher accuracy than instrument tested.
  - 7. Equipment used for field testing shall be more accurate than instrument being tested.
- F. Coordinate with General Contractor regarding testing schedule and availability of equipment ready for testing.
- G. Notify Owner and Engineer one week in advance of any testing.
- H. Any products which fail during the tests or are ruled unsatisfactory by the Owner's Representative shall be replaced, repaired, or corrected as prescribed by the Owner's Representative at the expense of the Contractor. Tests shall be performed after repairs, replacements or corrections until satisfactory performance is demonstrated.
- I. Testing Agency shall maintain written record of tests and shall assemble and certify final test report.
- J. Include all test results in the maintenance manuals.

### 3.06 CLEANING

- A. Prior to energizing of electrical equipment, the Contractor shall thoroughly clean the interior of enclosures from construction debris, scrap wire, etc. using Manufacturer's approved methods and materials.
- B. Upon completion of Project, prior to final acceptance, the Contractor shall thoroughly clean both the interior and exterior of all electrical equipment per Manufacturers approved methods and materials. Remove paint splatters and other spots, dirt, and debris.
- C. Touch-up paint any marks, blemishes or other finish damage suffered during installation.

### 3.07 PROJECT CLOSEOUT



SECTION 26 00 90  
ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Work included: Labor and equipment necessary to complete the demolition required for the item specified under this Division, including but not limited to:

1. Electrical demolition

1.02 SYSTEM DESCRIPTION

- A. Disconnection, removal and relocation of all wiring, luminaires, outlets, conduit, and all other types of electrical equipment as described on Drawings.
- B. Purpose is to remove, relocate and extend existing installations to accommodate new construction.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment necessary for patching and extending Work, as specified in other Sections.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Contractor shall thoroughly review conditions in the area of demolition prior to commencing Work to ensure complete understanding of existing installation in relationship to demolition Work.

3.02 GENERAL REQUIREMENTS

- A. Remove all wiring, luminaires, outlets, conduit, and all other types of electrical equipment indicated to be removed. Devices that are to be removed may require reworking conduit and wiring in order to maintain service to other devices. If removed devices are on walls or ceilings that are to remain, blank coverplates are to be installed on outlet boxes.
- B. Where remodeling interferes with circuits in areas that are otherwise undisturbed, circuits shall be reworked as required.
- C. Existing devices and circuiting that are indicated are indicated only for informational purposes. Contractor shall visit the Project site and shall verify conditions as they exist and



- D. All equipment, luminaires, devices, etc., which are removed shall be delivered to the Owner for disposition. All items which are removed and not wanted by the Owner and which are not reused shall become the property of the Contractor and shall be legally removed from the Project site.
- E. Cutting and patching necessary for the removal of Electrical Work shall be included.

SECTION 26 05 19  
BUILDING WIRE AND CABLE

PART 1 - GENERAL

1.01 SUMMARY

- UL 1581; Reference Standard for Electrical Wires, Cables and Flexible Cords.
- UL 2196; Standard for Tests of Fire Resistive Cables.
- 2. National Electrical Manufacturer Association (NEMA):
  - NEMA WC-70; Power Cables Rated 2,000 V or Less for the Distribution of Electrical Energy.
- 3. Institute of Electrical and Electronic Engineers (IEEE):
  - IEEE 82; Test Procedure for Impulse Voltage Tests on Insulated Conductors.
  - IEEE 576; Recommended Practice for Installation, Termination, and Testing of Insulated Power Cable as Used in Industrial and Commercial Applications.

### 1.03 SUBMITTALS

- A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements, the following items:
  - 1. Data/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
  - 2. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
  - 3. Submit Manufacturer's installation instructions.
  - 4. Final test results.

### 1.04 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.
- C. Independent Testing Agency qualifications: Refer to Section 260010: Basic Electrical Requirements.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.
  - 1. Building wire:

- a. Cerrowire
- b. General Cable
- c. Southwire Company
- d. Stabiloy (aluminum only)
- e. United Wire and Cable

2. Flexible cords and cables:

- a. Carol Cable Company
- b. Cerrowire
- c. PWC Corp

3. Wiring connectors and terminations:

- a. 3M Company.
- b. Ideal.
- c. Blackburn-Holub.
- d. Burndy.
- e. Thomas & Betts Corp.
- f. Beau Barrier.

B. Substitutions: Under provisions of Section 260010: Basic Electrical Requirements.

2.02 BUILDING WIRE

A. Conductor material:

5. Copper feeders and branch circuits #6 AWG and smaller: Type TW, THW, XHHW or dual rated THHN/THWN.
6. Feeders and branch circuits for direct-current (DC) in wet locations: Type XHHW-2.
7. Conductors for variable frequency drives (VFD): Type XHHW-2.
8. Service Entrance: Type RHW or THWN.
9. Control Circuits: Type THW or dual rated THHN/THWN.
10. Identify system conductors as to voltage and phase connections by means of color-impregnated insulation.

#### 2.03 FLEXIBLE CORDS AND CABLES (TYPE'S')

- A. Provide flexible cords and cables of size, type and arrangement as indicated on the Drawings.
- B. Type 'S' flexible cords and cables shall be manufactured in accordance with CEC Article 400 and composed of two or more conductors and a full size green insulated ground wire with an outer jacket of rubber or neoprene as noted.
- C. Flexible cords and cables shall be fitted with wire mesh strain relief grips either as an integral component of the connector or as an independently supported unit.
- D. Suspended flexible cords and cables shall incorporate safety spring(s) unless otherwise noted.

#### 2.04 WIRING CONNECTIONS AND TERMINATIONS

- A. Bolted pressure connectors: Provide wide range-taking connectors with cast bronze compression bolts, designed for parallel taps, tees, crosses or end-to-end connections.
- B. Electrical spring wire connectors:
  1. Provide multi-part construction incorporating a non-restricted, zinc coated square cross-section steel spring enclosed in a steel sheet with an outer jacket of plastic and insulating skirt.
  2. Self-striping pigtail and tap U-contact connectors shall not be used.
- C. Compression type terminating lugs:
  1. Provide tin-plated copper high-compression type lugs for installation with hand or hydraulically operated circumference-crimping tools and dies as stipulated by the lug Manufacturer or as indicated on Drawings. Notch or single point type crimping is NOT acceptable.
  2. Two-hole, long barrel lugs shall be provided for size #4/0 and larger wire where terminated to bus bars. Use minimum of three crimps per lug, on sizes where possible.

- D. Splicing and insulating tape: Provide black, ultraviolet proof, self-extinguishing, 7-mil thick vinyl general purpose electrical tape with a dielectric strength of 10,000volts suitable for temperatures from minus 18-degrees C to 105-degrees C.
- E. Insulating putty:
  - 1. Provide pads or rolls of non-corrosive, self-fusing, one-eighth inch thick rubber putty with PVC backing sheet. Scotch vinyl mastic pads and roll or equal.
  - 2. Use putty suitable for temperatures from minus 17.8-degrees C to 37.8-degrees C with a dielectric strength of 570volts/mil minimum.
- F. Insulating resin:
  - 1. Provide two-part liquid epoxy resin with resin and catalyst in pre-measured, sealed mixing pouch. Scotchcast 4 or equal for wet or underground vaults, boxes, etc. splices or terminations.
  - 2. Use resin with a set up time of approximately 30-minutes at 21.1-degrees C and with thermal and dielectric properties equal to the insulating properties of the cables immersed in the resin.
- G. Terminal strips:
  - 1. Provide box type terminal strips in the required quantity plus 25% spare. Install in continuous rows in terminal cabinets.
  - 2. Use the box type terminal strips with barrier open backs and with ampere ratings as required.
  - 3. Identify all terminals with numbering sequence being used for a system.
- H. Cable ties: Provide harnessing and point-to-point wire bundling with nylon cable ties. All cable ties shall be installed using tool supplied by Manufacturer of ties.
- I. Wire lubricating compound:
  - 1. UL listed for the wire insulation and conduit type and shall not harden or become adhesive.
  - 2. Shall not be used on wire for isolated type electrical power systems.
- J. Bolt termination hardware:
  - 1. Bolts shall be plated, medium carbon steel heat-treated, quenched and tempered equal to ASTM A-325 or SAE grade 5; or si 1 0 0 TJ ET 3

4. Belleville conical spring washers shall be hardened steel, cadmium plated or silicon bronze.
5. Each bolt connecting lug(s) to a terminal or bus shall not carry current exceeding the following values:
  - a. 1/4" bolt: 125amps
  - b. 5/16" bolt: 175amps
  - c. 3/8" bolt: 225amps
  - d. 1/2" bolt: 300amps
  - e. 5/8" bolt: 375amps
  - f. 3/4" bolt: 450amps

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of wire and cable installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

#### 3.02 APPLICATION

- A. All wire, conductor and cable with their respective connectors, fittings and supports shall be UL listed for the installed application and ambient condition.
- B. Feeders and branch circuits in wet locations shall be rated 75-degree C.
- C. Feeders and branch circuits in dry locations shall be rated 90-degree C.
- D. Feeders and branch circuits for direct-current (DC) systems, such as PV installations, in wet locations shall be type XHHW-2 copper conductors.
- E. For wiring of the following, refer to the indicated Code Articles:
  1. Fire pump systems shall comply with CEC Article 695.
  2. Emergency systems shall comply with CEC Article 700.
  3. Fire alarm systems shall comply with CEC Article 760.
  4. Where the any above are required to be fire-resistive, refer to CEC Article 728.
- F. Minimum conductor size:
  1. Provide minimum AWG #12 for all power and lighting branch circuits.
  2. Provide minimum AWG #14 for all line voltage signal and control wiring unless otherwise indicated.







1. Provide installation equipment that will prevent the cutting or abrasion of insulation during pulling of cables.
  2. Use rope made of nonmetallic material for pulling feeders.
  3. Attach pulling lines for feeders by means of either woven basket grips or pulling eyes attached directly to the conductors.
  4. Pull in together multiple conductors or cables in a single conduit.
  5. Pulling tensions and sidewall pressures shall not exceed 60% of the manufacturer's recommended maximum values. Pulling tension shall be continuously monitored during the pull by a calibrated dynamometer. If pulling tension is exceeded during the pull, immediately notify the engineer to determine if the cables will be considered damaged and require contractor replacement.
- F. Install and test all cables in accordance with Manufacturer's instructions and warranty.

### 3.05 WIRE SPLICES, JOINTS AND TERMINATION

- A. Join and terminate wire, conductors, and cables in accordance with UL 486A, C, CEC and Manufacturer's instructions.
- B. Thoroughly clean wires before installing lugs and connectors.
- C. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
- D. Splices and terminations shall be made mechanically and electrically secure.
- E. Where it's determined that unsatisfactory splice or terminations have been installed, remove the devices and install approved devices at no addition cost.
- F. Terminate wires in Terminal Cabinets, relay, and contactor panels, etc. using terminal strip connectors.
- G. Insulate spare conductors with electrical tape and leave sufficient length to terminate anywhere in the panel or cabinet.
- H. Install cable ties and maintain harnessing.
- I. Encapsulate splices in exterior outlets, pull boxes and junction boxes using specified insulating resin kits. Make all splices watertight for exterior equipment and equipment in pump rooms.
- J. Make up all splices and taps in accessible junction or outlet boxes with connectors as specified herein. Pigtails and taps shall be the same color as the feed conductor. Form conductor prior to cutting and provide at least 6-inches of tail and neatly packed in box after splice is made up.
- K. Branch circuits (#10 AWG and smaller):





- a. Contractor shall perform feeder and branch circuit insulation test after installation and prior to connection to utilization devices such as fixtures, motors, or appliances. Testing shall be as follows:

- 1) 100% of all feeders 100amp rated and above /FAAAAI ztc 1E.n shall be as follows:



1. Data/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
2. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
3. Submit Manufacturer's installation instructions.

#### 1.05 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

### PART 2 - PRODUCTS

#### 2.01 GROUND CONDUCTORS

- A. Refer to Specification Section 260519: Building Wire and Cable for conductor specifications.
- B. General purpose insulated:
  1. UL approved and code sized copper conductor, with dual rated THHN/THWN insulation, color identified green.
  2. Where continuous color-coded conductors are not commercially available, provide a minimum 4" long color band with green, non-aging, plastic tape in accordance with CEC.
- C. Bare conductors in direct contact with earth or encased in concrete: #4/0 AWG copper minimum, U.O.N.
- D. Bonding pigtails: Insulated copper conductor, identified green, sized per code, and provide with termination screw or lug. Provide solid conductors for #10 AWG or smaller and stranded conductors for #8 AWG or larger.

#### 2.02 INSULATED GROUNDING BUSHINGS

- A. Plated malleable iron or steel body with 150-degree Centigrade molded plastic insulating throat and lay-in grounding lug.

#### 2.03 CONNECTIONS TO PIPE

- A. For cable to pipe: UL and CEC approved bolted connection.

#### 2.04 CONNECTIONS TO STRUCTURAL STEEL, GROUND RODS OR SPLICEion.

1. Exothermic welds shall be used for cable-to-cable and cable-to-ground rod and for cable to structural steel surfaces. Exothermic weld kits shall be as manufactured by Cadweld or equal. Each particular type of weld shall use a kit unique to that type of weld.
2. High-pressure compression type connectors shall be used for cable-to-cable and cable-to-ground rod connections.



2. Visual and mechanical inspection:
  - a. Check tightness and welds of all ground conductor terminations.
  - b. Verify installation complies with the intent of the Contract Documents
3. A typewritten record of measured resistance values shall be submitted for review and included with the operation and maintenance manual furnished to the Owner at the time of Project closeout and before certificate of final payment is issued.

END OF SECTION 26 05 26

SECTION 26 05 29  
ELECTRICAL HANGERS AND SUPPORTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included: Labor, materials, and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:

3. Submit Manufacturer's installation instructions.

#### 1.05 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.

1. Concrete fasteners:

- a. Phillips "Red-Head".
- b. Remington.
- c. Ramset.

2. Concrete inserts and construction channel:

- a. Unistrut Corp.
- b. GS Metals "Globe Strut."
- c. Thomas & Betts "Kindorf" Corp.

3. Conduit straps:

- a. O-Z/Gedney.
- b. Erico "Caddy" Fastening Products.
- c. Thomas & Betts "Kindorf" Corp.

- B. Substitutions: Under provisions of Section 260010: Basic Electrical Requirements.

#### 2.02 CONCRETE FASTENERS

- A. Provide expansion-shield type concrete anchors.
- B. Provide powder driven concrete fasteners with washers. Obtain approval by Architect and Structural Engineer prior to use.

#### 2.03 CONCRETE INSERTS

- A. Provide pressed galvanized steel, concrete spot insert, with oval slot capable of accepting square or rectangular support nuts of ¼ inch to ½ inch diameter thread for rod support.

#### 2.04 THREADED ROD

- A. Provide steel threaded rod, sized for the load unless otherwise noted on the Drawings or in the Specifications.

#### 2.05 CONSTRUCTION CHANNEL

- A. Provide 1.5-inch by 1.5-inch, 12-gauge galvanized steel channel with 17/32-inch diameter bolt holes and 1-1/2 inch on center in the base of the channel.

#### 2.06 CONDUIT STRAPS

- A. One-hole strap, steel, or malleable iron, with malleable iron clamp-back spacer for surface mounted wall and ceiling applications.
  - 1. Use malleable strap with spacers for exterior and wet locations.
  - 2. Use steel strap without spacers for interior locations.
- B. Steel channel conduit strap for support from construction channel.
- C. Steel conduit hanger for pendant support with threaded rod
- D. Steel wire conduit support strap for support from independent #12-gauge hanger wires.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of supporting device installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

#### 3.02 PREPARATION

- A. Coordinate size, shape, and location of concrete pads with Division 03, Cast-in-place concrete.
- B. Layout support devices to maintain headroom, neat mechanical appearance and to support the equipment loads.
- C. Where indicated on the Contract Documents, install freestanding electrical equipment on concrete pads.

#### 3.03 INSTALLATION

- A. Furnish and install supporting devices as noted throughout Division 26.
- B. Electrical device and conduit supports shall be independent of all other system supports that are not structural elements of the building, unless otherwise noted.
- C. Fasten hanger rods, conduit clamps, outlet, and junction boxes to building structure using precast inserts, expansion anchors, preset inserts, or beam clamps.

- D. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster or gypsum board partitions and walls.
- E. Use expansion anchors or preset inserts in solid masonry walls.
- F. Use self-drilling anchors, expansion anchor or preset inserts on concrete surfaces.
- G. Use sheet metal screws in sheet metal studs and wood screws in wood construction.
- H. Do not fasten supports to piping, ductwork, mechanical equipment, conduit, or acoustical ceiling suspension wires.
- I. Do not drill structural steel members unless first approved in writing by the Architect or Structural Engineer.
- J. Fabricate supports from structural steel or steel channel, rigidly welded, or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.
- K. Install surface-mounted cabinets and panelboards with minimum of four anchors. Provide additional support backing in stud walls prior to sheet rocking as required to adequately support cabinets and panels.
- L. Bridge studs top and bottom with channels to support flush mounted cabinets and panelboards in stud walls.

#### 3.04 ERECTION OF METAL SUPPORTS

- A. Cut, fit and place miscellaneous metal fabrications accurately in location, alignment and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS "Structural Welding Code."

#### 3.05 WOOD SUPPORTS

- A. Cut, fit, and place wood grounds, nailers, blocking and anchorage accurately in location, alignment and elevation to support and anchor electrical materials and equipment.

#### 3.06 ANCHORAGE

- A. All floor mounted, free standing electrical equipment such as transformers, switchboards, distribution boards, etc. shall be securely fastened to the floor structure.
- B. Anchorage of electrical equipment shall comply with the seismic requirements as outlined in Section 260010: Basic Electrical Requirements.

END OF SECTION 26 05 29

CONDUIT  
26 05 31 - 2

UL 1;	Flexible Metal Conduit.
UL 6;	Rigid Metal Conduit.
UL 360;	Liquid-Tight Flexible Steel Conduit.
UL 514B;	Conduit, Tubing and Cable Fittings.
UL 635;	Insulating Bushings.
UL 797;	Electrical Metallic Tubing - Steel.
UL 1242;	Intermediate Metal Conduit - Steel.

3. National Electrical Manufacturer Association (NEMA):

NEMA RN1;	PVC Externally coated Galvanized Rigid Steel Conduit.
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1.03 SUBMITTALS

A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements the following items:

1. Data/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
2. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
3. Submit Manufacturer's installation instruction. Provide written instructions for raceway products requiring glues, special tools, or specific installation techniques.

1.04 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted and approved.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.

1. Metal conduit:
  - a. Allied Tube and Conduit Co.
  - b. Triangle PWC, Inc.
  - c. Western Tube and Conduit Corp.

- d. Spring City Electrical Manufacturing Co.
- e. Alflec Corp.
- f. American Flexible Metal Conduit Co.
- g. Anaconda.

2. Fittings:

- a. Appleton Electric Co.
- b. OZ/Gedney.
- c. Thomas & Betts Corp.
- d. Spring City Electrical Manufacturing Co.

B. Substitutions: Under provisions of Section 260010: Basic Electrical Requirements.

2.02 GALVANIZED RIGID STEEL CONDUIT (GRS)

- A. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and UL 6.
- B. Standard threaded couplings, locknuts, bushings, and elbows: Only materials of steel or malleable iron are acceptable. Locknuts shall be bonding type with sharp edges for digging into the metal wall of an enclosure; provide two locknuts at each box or can, inside and outside.
- C. Three-piece couplings: Hot dip galvanized, cast malleable iron.
- D. Insulating bushings: Threaded polypropylene or thermosetting phenolic rated 150-degree C minimum.
- E. Insulated grounding bushings: Threaded cast malleable iron body with insulated throat and steel "lay-in" ground lug with compression screw.



2.04 INTERMEDIATE METAL CONDUIT (IMC)

- A. Conduit: Hot dip galvanized steel meeting the requirements of CEC Article 345 and conforming to ANSI C80.6 and UL 1242.
- B. Fittings: Conduit couplings, connector and bushing shall be as specified for galvanized rigid

2.08 MISCELLANEOUS CONDUIT FITTINGS AND PRODUCTS

- A. Watertight conduit entrance seals: Steel or cast malleable iron bodies and pressure clamps with PVC sleeve, neoprene sealing grommets and PVC coated steel pressure rings. Fittings shall be supplied with neoprene sealing rings between the body and PVC sleeve.
- B. Watertight cable sealing bushings: One piece, compression molded sealing ring with PVC coated steel pressure disks, stainless steel sealing screws and zinc plated cast malleable iron locking collar.
- C. Expansion fittings: Multi-piece unit comprised of a hot dip galvanized malleable iron or steel body and outside pressure bussing designed to allow a maximum of 4" conduit movement (2" in either direction). Furnish with external braid tinned copper bonding jumper. Unit shall be UL listed for wet or dry locations.
- D. Expansion/deflection couplings: Multi-piece unit comprised of a neoprene sleeve with internal flexible tinned copper braid attached to bronze end couplings with stainless steel

- A. Contractor shall thoroughly examine Project site conditions for acceptance of conduit system installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.02 APPLICATION

- A. Galvanized rigid steel conduit (GRS) can be used in the following applications:
  - 1. For feeders and branch circuits located indoors, concealed or exposed above suspended ceilings, in manufacturing.

- equipment or machinery, controllers, solenoid valves, float and flow switches or similar devices. These areas are typically food preparation and dishwashing areas, sump wells, loading docks, pump rooms, exterior areas, etc.
- G. Fire-Resistive Systems: Refer to CEC Article 728. All devices utilized, mountings, and supports shall be listed as part of the fire-resistive system.

### 3.03 PREPARATION

- A. Locations of conduit runs shall be planned in advance of the installation and coordinated with ductwork, plumbing, ceiling and wall construction in the same areas and shall not unnecessarily cross other conduits or pipe, nor prevent removal of ceiling tiles or panels, nor block access to mechanical or electrical equipment.
- B. Where practical, install conduits in groups in parallel vertical or horizontal runs and at elevations that avoid unnecessary offsets.
- C. All conduits shall be run parallel or at right angles to the centerlines of columns and beams, whether routed exposed, concealed above suspended ceiling or in concrete slabs.
- D. Conduits shall not be placed closer than 12-inches to a flue, parallel hot water, steam line or other heat producing source or three inches from such lines when crossing perpendicular to the runs.
- E. Communications conduits shall not be placed closer than 12 inches to power, a flue, parallel hot water, steam line or other heat producing source or three inches from such lines when crossing perpendicular to the runs.
- F. Exposed conduit installation shall not encroach into the ceiling height headroom of walkways or doorways. Where possible, install horizontal raceway runs above water and below steam piping.
- G. The largest trade size conduits in concrete floor and wall slabs shall not exceed 1/3 the floor or wall thickness and conduits shall be spaced a minimum of three conduit diameters apart unless otherwise noted on the Drawings. All conduits shall be installed in the center of concrete slabs or wall and shall not be placed between reinforcing steel and the bottom of floor slabs.
- H. In long runs of conduit, provide sufficient pull boxes inside buildings to facilitate pulling wires and cables, with spacing not to exceed 150-feet. Support pull boxes from structure independent of conduit supports. These pull boxes are not indicated on the Drawings.
- I. Provide all reasonably inferred standard conduits fitting and products required to complete conduit installation to meet the intended application whether noted, indicated, or specified in the Contract Documents or not.



- P. Make bends with standard conduit bending hand tool or machines. The use of any item not specifically designed for the bending of electrical conduit is strictly prohibited.
- Q. A run of conduit between terminations at wire pulling points shall not contain more than the equivalent of four quarter bends (360-degrees, total).
- R. A run of communications and signal conduit between terminations at wire pulling points shall not contain more than the equivalent of two quarter bends (180-degrees, total).

3.05 PENETRATIONS

D. Waterproofing: At floor, exterior wall, and roof conduit penetrations, completely seal





- I. Use short length (maximum of 6ft) of the appropriate FMC or LFMC conduit for connections to motors and other electrical equipment subject to movement, vibration, misalignment, cramped quarters, or noise transmission. Provide liquidtight flexible metal conduit for installation in exterior locations, moisture or humidity-laden atmosphere, corrosive atmosphere, water hose or spray wash-down operations and locations subject to seepage or dripping of oil, grease, or water. Provide a green ground wire with FMC or LFMC conduit.

### 3.08 SUPPORTS

- A. Provide supports for raceways as specified in Section 260529: Electrical Hangers and Supports.
- B. All raceways systems shall be secured to building structures using specified fasteners, clamps and hangers spaced according to the CEC.
- C. Support single runs of conduit using one-hole pipe straps. Where run horizontally on walls in damp or wet locations, install "clamp backs" to space conduit off the surface.
- D. Multiple conduit runs shall be supported using "trapeze" hangers fabricated from specified construction channel, mounted to 3/8-inch diameter, threaded steel rods secured to building structures. Fasten conduit to construction channel with standard one-hole pipe clamps or the equivalent. Provide lateral seismic bracing for hangers.
- E. Individual 3/4" conduits installed above suspended ceilings may be attached to the ceiling's hanger wire using spring steel support clips provided that not more than two conduits are attached to any single support wire.
- F. Support exposed vertical conduit runs at each floor level, independent of cabinets or switches to which they run, by means of acceptable supports.
- G. Fasteners and supports in solid masonry and concrete:
  1. Use steel or malleable iron concrete inserts set in place prior to placing the concrete.



SECTION 26 05 33  
BOXES

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included: Labor, materials, and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:
1. Wall and ceiling outlet boxes.
  2. Pull and junction boxes.



- C. Conduit outlet body: Provide malleable iron, oblong conduit outlet bodies with threaded conduit hubs and neoprene gasket, cast iron covers.

## 2.03 PULL AND JUNCTION BOXES

### A. Sheet metal pull and junction box:

1. Provide standard outlet or concrete ring boxes wherever possible; otherwise use minimum 16-gauge galvanized sheet metal, NEMA 1 boxes, sized to Code requirements with covers secured by cadmium plated machine screws located 6 inches on centers.
2. ANSI/NEMA OS 1.

- B. Flush mounted pullboxes and junction boxes: Provide overlapping covers with flush head cover retaining screws, prime coated.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of box installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

### 3.02 PREPARATION

- A. Install all outlet boxes flush with building walls, ceilings, and floors except where boxes are installed in mechanical and electrical rooms, in cabinetry, above accessible ceilings or where exposed Work is called for on the Drawings.
- B. Locate pullboxes and junction boxes in concealed locations above removable ceilings or exposed in electrical rooms, utility rooms or storage areas.
- C. Install outlet boxes at the locations and elevations indicated on the Drawings or specified herein. Make adjustments to locations as required by structural conditions and to suit coordination requirements of other trades.
- D. Locate switch outlet boxes on the latch side of doorways unless otherwise indicated.
- E. Locate outlet boxes above hung ceilings having concealed suspension systems, adjacent to openings for removable recessed luminaires.
- F. Do not install outlet boxes back-to-back, separate boxes by at least 6". In fire-rated walls separate boxes by at least 24" and wall stud.
- G. Adjust position of outlet boxes in finished masonry walls to suit masonry course lines. Coordinate cutting of masonry walls to achieve neat openings for boxes.

### 3.03 INSTALLATION

- A. Install boxes in accordance with Manufacturer's written instructions, as indicated on Drawings and as specified herein.

- B. Locate electrical boxes as indicated on Drawings and as required for splices, taps, wire pulling, equipment connections and Code compliance.
- C. Install junction or pullboxes where required to limit bends in conduit runs to not more than 360 degrees or where pulling tension achieved would exceed the maximum allowable for the cable to be installed. Note that these boxes are not indicated on the Drawings.
- D. Install raised covers (plaster rings) on all outlet boxes in stud walls or in furred, suspended, or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.
- E. Leave no unused openings in any box. Install close-up plugs as required to seal openings.
- F. Provide cast metal boxes with gasketed cast metal cover plates where boxes are exposed in damp or wet locations.
- G. Welded outlet boxes shall only be used in concealed interior installations.
- H. Provide an access panel in permanent ceiling or wall where boxes are installed and will be inaccessible.
- I. For boxes mounted in exterior walls, make sure that there is insulation behind outlet boxes to prevent condensation in boxes.
- J. For outlets mounted above counters, benches or backsplashes, coordinate location and mounting heights with built-in units. Adjust mounting height to agree with required location for equipment served.
- K. Use conduit outlet bodies to facilitate pulling of conductors or to make changes in conduit direction only. Do not make splices in conduit outlet bodies.
- L. Add additional sheet rock as necessary to maintain original fire rating of walls where boxes are installed.
- M. Install galvanized steel coverplates on boxes in unfinished areas, above accessible ceilings and on surface mounted outlets.

#### 3.04 SUPPORTS

- A. Provide boxes installed in metal stud walls with brackets designed for attaching directly to the studs or mount boxes on specified box supports.
- B. Mount boxes, installed in suspended ceilings of gypsum board or lath and plaster construction, to 16-gauge metal channel bars attached to main ceiling runners.
- C. Support boxes independently of conduit system.
- D. Support boxes, installed in suspended ceilings supporting acoustical tiles or panels, directly from the structure above wherever pendant mounted luminaires are to be installed from the box.
- E. Support boxes mounted above suspended acoustical tile ceilings, directly from the structure above.

END OF SECTION 26 05 33

SECTION 26 05 53  
ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included: Labor, materials, and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:
  - 1. Electrical equipment nameplates.
  - 2. Panelboard directories.
  - 3. Wire and cable identification.
  - 4. Junction box identification.
  - 5. Inscribed device coverplates.
- B. Related Work: Consult all other Sections, determine the extent and character of related Work, and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.
  - 1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
  - 2. Division 09: Painting.

1.02 SUBMITTALS

- A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements, the following items:
  - 1. Data/catalog cuts for each product and component specified herein.
  - 2. Schedules for nameplates to be furnished.



- a. Kroy.
- b. Merlin.

B. Substitutions: Under provisions of Section 260010: Basic Electrical Requirements.

## 2.02 NAMEPLATES

- A. Type NP: Engraved, plastic laminated labels, signs, and instruction plates. Engrave stock melamine plastic laminate 1/16-inch minimum thickness for signs up to 20-square inches or 8-inches in length; 1/8-inch thick for larger sizes. Engraved nameplates shall have white letters and be punched for mechanical fasteners.
- B. Color and letter height as specified in Part 3: Execution.

## 2.03 PANELBOARD DIRECTORIES (400 AMP OR LESS)

- A. Directories: A 6" x 8" minimum size circuit directory frame and card with clear plastic covering shall be provided inside the inner panel door.
- B. Circuit numbering: Starting at the top, odd numbered circuits in sequence down the left-hand side and even numbered circuits down the right-hand side.

## 2.04 WIRE AND TERMINAL MARKERS

- A. Provide self-adhering, pre-printed, machine printable or write-on, self-laminating vinyl wrap around strips.
- B. Blank markers shall be inscribed using the printer or pen recommended by Manufacturer for this purpose.

## 2.05 CONDUCTOR PHASE MARKERS

- A. Colored vinyl plastic electrical tape, 3/4" wide, for identification of phase conductors. Scotch 35 Brand Tape or equal.

## 2.06 INSCRIBED DEVICE COVERPLATES

- A. Coverplate material shall be as specified in Section 262726: Wiring Devices.
- B. Methods of inscription: (Unless otherwise noted)
  1. Type-on-tape:
    - a. Imprinted or thermal transfer characters onto tape lettering system.
    - b. Tape trimmer.
    - c. Matte finish spray-on clear coating.
  2. Engraving:
    - a. 1/8" high letters.

- b. Paint filled letters finished in black.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of identification device installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

#### 3.02 NAMEPLATES

- A. Installation:
  1. Degrease and clean surfaces to receive nameplates.
  2. Install nameplates parallel to equipment lines.
  3. Secure nameplates to equipment fronts using machine screws.
- B. Provide type 'NP' color coded nameplates that present, as applicable, the following information:
  1. Equipment or device designation:
    - a. Equipment designations shall conform to the equipment names shown on drawings.
  2. Amperage, KVA or horsepower rating, where applicable.
  3. Voltage or signal system name.
  4. Source of power or control.
- C. Nameplates for power system distribution equipment and devices are to be black.
- D. Minimum letter height shall be as follows:
  1. For **panelboards, switchboards, battery panels**, etc.: ½ inch letters to identify equipment designation. Use ¼ inch letters to identify voltage, phase, wires, etc.
  2. For individual circuit breakers, switches and motor starters in **panelboards** use 3/8-inch letters to identify equipment designation. Use 1/8-inch letters to identify all other.
  3. For individual mounted circuit breakers, disconnect switches, enclosed switches and motor starters use 3/8-inch letters to identify equipment designation. Use 1/8" letters to identify all other.

#### 3.03 PANELBOARD DIRECTORIES (400AMP OR LESS)

- A. Provide typewritten directories arranged in numerical order denoting loads served by room number or area for each circuit.
- B. Verify room numbers or area designation with Project Manager.

- C. Mount panelboard directories in a minimum 6" x 8" metal frame under clear plastic cover inside every panelboard.

### 3.04 WIRE AND CABLE IDENTIFICATION

- A. Provide wire markers on each conductor in panelboards, pull boxes, outlet, and junction boxes and at load connection. Identify with branch circuit or feeder number for power and lighting circuits and with control wire number as indicated on equipment Manufacturer's Shop Drawings for control wiring.
- B. Provide colored phase markers for conductors as noted in Section 260519: Building Wire and Cable. Apply colored, pressure sensitive plastic tape in half-lapped turns for a distance of 3-inches from terminal points and in boxes where splices or taps are made. Apply the last two laps of tape with no tension to prevent possible unwinding. Do not cover cable identification markings by taping.

### 3.05 JUNCTION BOX IDENTIFICATION

- A. The cover of junction, pull and connection boxes for both power and signal systems, located above suspended ceilings and below ceilings in non-public areas, shall be clearly marked with a permanent ink felt pen. Identify the circuit(s) (panel designation and circuit numbers) contained in each box, unless otherwise noted or specified.

### 3.06 INSCRIBED DEVICE COVERPLATE

#### A. General:

1. Lettering type: Helvetica, 12 point or 1/8" high.
2. Color of characters shall be black.
3. Locate the top of the inscription 1/2" below the top edge of the coverplate.
4. Inscription shall be centered and square with coverplate.

#### B. Application:

1. Type-on-tape inscriptions shall be provided for the following devices:
  - a. Receptacles.
  - b. Outlets in surface raceways.
  - c. Telecommunication outlets.
2. Engraved inscriptions shall be provided for the following devices:
  - a. Multi-ganged switches.
  - b. Special purpose switches.
3. Type-on-tape installation:

- a. Tape shall be trimmed to the height of the letters.
- b. Trim tape length to ¼-inch back from each edge of coverplate.
- c. Contractor hands shall be clean or covered with surgical type glove prior to application of tape. Tape installations with visible fingerprints or smudges will not be acceptable.

END OF SECTION 26 05 53

SECTION 26 27 26  
WIRING DEVICES

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included: Labor, materials, and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:
  - 1. Wall switches.
  - 2. Occupancy/vacancy sensors, including wallbox and ceiling mounted.
  - 3. Coverplates.
- B. Related Work: Consult all other Sections, determine the extent and character of related Work, and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.
  - 1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
  - 2. Division 03: Cast-in-place concrete.

1.02 REFERENCES

- A. Comply with the latest edition of the following applicable Specifications and standards except as otherwise indicated or specified.
  - 1. National Electrical Manufacturer's Association (NEMA):
    - NEMA WD-1;                    General-Purpose Wiring Devices.
    - NEMA WD-2;                    Semiconductor Dimmers for Incandescent Lamps.
    - NEMA WD-5;                    Specific-Purpose Wiring Devices.
    - NEMA SSL 7A;                    Phase-Cut Dimming for Solid State Lighting
  - 2. Underwriter's Laboratories (UL):
    - UL 20                            General-Use Snap Switches.
    - UL 231;                            Power Outlets.
    - UL 310;                            Electrical Quick-Connect Terminals.
    - UL 498;                            Attachment Plugs and Receptacles.
    - UL 514A;                            Metallic Outlet Boxes.
    - UL 514D;                            Cover Plates for Flush-Mounted Wiring Devices.

UL 943; Ground-Fault Circuit-Interrupters.  
UL 1681; Wiring Device Configurations.

### 1.03 SUBMITTALS

- A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements, the following items:
  - 1. Data/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
  - 2. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
  - 3. Provide color finishes for Architect to select from.
  - 4. Submit Manufacturer's installation instructions.
- B. Where inscribed device coverplates are noted on the Drawings or in the Specifications, conform to the requirements of Section 260553: Electrical Identification.

### 1.04 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

### 1.05 WARRANTY

- A. Occupancy sensors offered under this Section shall be covered by a 1-year parts and labor warranty for malfunctions resulting from defects in materials and workmanship. Warranty shall begin upon acceptance by the Owner.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.
  - 1. Switches, receptacles and coverplates:
    - a. Pass & Seymour.
    - b. Hubbell.
    - c. Leviton.
  - 2. Occupancy/vacancy sensors switches, time switches:







H. Ceiling or wall mounted single-directional sensors:

1. Sensor shall provide minimum coverage of 900-square feet.
2. Operation shall be automatic "ON" and automatic "OFF". Provide with a manual override switch.
3. Time delay adjustment from 30-seconds to 20-minutes. Set initial time-out setting at 10-minutes. Set sensitivity adjustment at maximum.
4. Load capacity of 20amps per power or slave pack at connected voltage.
5. Power pack, if required, consisting of Class 2, 24volt output transformer and relay in single housing, capable of powering up 2 sensors and mounted inside standard 4-inch square box.
6. For use in small office, classroom, and similar areas.

I. Ceiling mounted omnidirectional sensors:

1. Sensor shall provide minimum omnidirectional coverage of 1000-square feet.
2. Operation shall be automatic "ON" and automatic "OFF". Provide with a manual override switch.
3. Time delay adjustment from 30-seconds to 20-minutes. Set initial time-out setting at 10-minutes. Set sensitivity adjustment at maximum.
4. Load capacity of 20amps per power or slave pack at connected voltage.
5. Power pack, if required, consisting of Class 2, 24volt output transformer and relay in single housing, capable of powering up to 2 sensors and mounted inside standard 4-inch square box.
6. For use in large storage rooms and similar areas.

2.04 COVERPLATES

A. General:

1. Provide all coverplates with rounded edges and corners, smooth and free of grooves, embossing or other embellishment.
2. Provide mounting screws to match the plate finish.
3. Provide gang type coverplates where two or more devices are installed at one location. Individual gangable coverplates are not acceptable.
4. Provide plates of one design, standard conventional designer decora style, throughout the Project unless otherwise specified.

B. Color: Coverplate color shall be ivorywhiteblackgrayas specified by the Architect, unless otherwise noted.

C. Plastic coverplates:

1. Provide smooth, high impact, self-extinguishing thermoplastic coverplates and 0.100 inches thick with rounded edges and corners.
2. Provide openings to accommodate the devices indicated on the Drawings and in the Specifications.

D. Metal coverplates:

1. Provide smooth, type 430 stainless steel coverplates, 0.035" thick with rounded edges and corners.
2. Provide openings to accommodate the devices indicated on the Drawings and in the Specifications.
3. Provide removable plastic film to protect coverplates during installation. Remove film at time of final acceptance.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of wiring device installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.02 PREPARATION

- A. Coordinate switch mounting location with Architectural details. Unless otherwise noted, locate switches on latch side of door.

3.03 INSTALLATION

- A. Install wiring devices in accordance with Manufacturer's written instructions, as indicated on the Drawings and as specified herein.
- B. Install devices with the vertical centerline plumb and with all edges of the device flush against the adjacent wall surfaces.
- C. Mount switches at 42 inches to center above finished floor unless otherwise noted.
- D. Derate ganged dimmer switches as instructed by Manufacturer. Do not use common neutrals in dimmer circuits.
- E. Provide coverplates for all outlet boxes, switches, etc.
- F. Install blank coverplates on all outlet boxes in which no device is required or installed.
- G. Provide coverplates that completely cover wall opening and seat against wall.

3.04 OCCUPANCY/VACANCY WALLBOX SENSORS



1.01 SUMMARY

- A. Work included: Labor, materials, and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:
  - 1. Fuses.
  - 2. Molded case circuit breakers.
- B. Related Work: Consult all other Sections, determine the extent and character of related Work, and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

- A. Comply with the latest edition of the following applicable Specifications and standards except as otherwise indicated or specified:
  - 1. Underwriters Laboratories, Inc. (UL):
    - UL 248(1-16);            Low-Voltage Fuses.
    - UL 489;                 Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
    - UL 512;                 Fuseholders.
  - 2. National Electrical Manufacturer Association (NEMA):
    - NEMA AB 1;             Molded Case Circuit Breakers.

1.03 SUBMITTALS

6. Confirmation in writing of compliance with Arc Energy Reduction per CEC Articles 240.67 and 240.87.
7. Submit Manufacturer's installation instructions.
8. Complete bill of material listing all components.
9. Warranty.

#### 1.04 OPERATION AND MAINTENANCE MANUAL

- A. Supply operation and maintenance manuals in accordance with the requirements of Section 260010: Basic Electrical Requirements, to include the following:
  1. A detailed explanation of the operation of the system.
  2. Instructions for routine maintenance.
  3. Parts list and part numbers.
  4. Telephone numbers for authorized parts and service distributors.
  5. Final testing reports.

#### 1.05 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

#### 1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery: Overcurrent Protective Device components shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.
- B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.
- C. Handling: Handle in a9072 cm6399536 cm BT /Fp1(roj)-1(e)1to5Nsi5.( replaced6n f7LpCo)-1( 1 -36 0 cm )-1(k













SECTION 26 28 19  
DISCONNECT SWITCHES

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included: Labor, materials, and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:
  - 1. Disconnect Switches.
- B. Related Work: Consult all other Sections, determine the extent and character of related Work, and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

- A. Comply with the latest edition of the following applicable Specifications and standards except as otherwise indicated on specified:
  - 1. National Electrical Manufacturer Association (NEMA):
    - NEMA KS 1;                      Enclosed Switches.
  - 2. Underwriters Laboratories, Inc. (UL):
    - UL 512;                              Fuseholders.

1.03 SUBMITTALS

- A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements, the following items:
  - 1. Data/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
  - 2. As a minimum the following characteristics shall be indicated:
    - a. NEMA types.
    - b. Current rating.
    - c. Number of poles.
    - d. Fuse provisions.
    - e. Enclosure dimensions.
    - f. Voltage.
    - g. Horsepower rating (if applicable).
    - h. Short circuit rating.

3. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
4. Submit Manufacturer's installation instructions.

#### 1.04 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.
  1. Square D.
  2. ABB/ General Electric.
  3. Eaton.
  4. Siemens.
- B. Substitutions: Under provisions of Section 260010: Basic Electrical Requirements.

#### 2.02 DISCONNECT SWITCHES

- A. Description: Provide NEMA heavy-duty type switches with dead front construction and padlock provisions for up to three locks in the "OFF" position.
- B. Switch interior: Provide switch with switchblades that are fully visible in the "OFF" position when the door is open. Provide UL listed lugs for copper conductors, lugs to be front removable. Provide plated current carrying part.
- C. Switch mechanism: Provide switches with a quick-make, quick-break, position indicating, operating handle and mechanism and a dual cover interlock to prevent unauthorized opening of the switch door in the "ON" position or closing of the switch mechanism with the door open. Furnish an electrical interlock to de-energize control wiring when the disconnect switch is opened.
- D. Enclosures: Provide switches with hinged cover in NEMA 1 general purpose, sheet steel enclosure for dry locations and NEMA 3R weatherproof galvanized enclosures for exterior, damp, or wet locations, unless otherwise noted on the Drawings. Provide an enclosure treated with a rust-inhibiting phosphate primer and finished in gray baked enamel.
- E. Ratings: Provide switches that are horsepower rated for 240 VAC or 600volt AC as required for the circuit involved and that meet "I-SQUARED-T" requirements. Fusible switches to have provisions for the types of fuses specified in Section 262816: Overcurrent Protective Devices. UL listed short

circuit rating, when equipped with fuses to be 200,000amps RMS symmetrical. Furnish with provisions for RK-1 fuses for switches up to 600amps. 800amp switches and larger to have provisions for Class L fuses.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of disconnects switch installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

#### 3.02 PREPARATION

- A. Coordinate locations of switches and equipment in the field to provide code required clearances in front of switches and to ensure that switches are insight of the controller as described in CEC Article 430.

#### 3.03 INSTALLATION

- A. Install disconnect switches where indicated on the Drawings.
- B. Install fuses in fusible disconnect switches.
- C. Include construction channel and mounting hardware as required to support disconnect switch.

#### 3.04 IDENTIFICATION

- A. Provide engraved, machine screw retained type 'NP' nameplate on each disconnect switch. See Section 260553: Electrical Identification.

#### 3.05 CLEANING

1.01 SUMMARY

UL 1598; Luminares.  
UL 1598C; Light-Emitting Diode Retrofit Luminaire Conversion Kits.  
UL 8750; Light Emitting Diode (LED) Equipment for Use in Lighting Products.  
UL 8754; Holders, Bases, and Connectors for Solid-State (LED) Light Engines and Arrays.

3. National Electrical Manufacturers Associations (NEMA):

SSL-1; Electronic Drivers for LED Devices, Arrays or Systems.  
77; Temporal Light Artifacts: Test Methods and Guidance for Acceptance Criteria.  
LE-4; Recessed Luminaires, Ceiling Compatibility  
100; Wire Insulation Colors for Lighting Systems

4. Illuminating Engineering Society of North America (IESNA):

TM-21; Projecting Long Term Lumen Maintenance of LED Light Sources.  
TM-30; Method for Evaluating Light Source Color Rendition.  
TM-30-Annex E Recommendations for Specifying Light Source Color Rendition  
LM-79; Electrical and Photometric Measurements of Solid-State Lighting Products.  
LM-80; Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules.  
LM-84; Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires.  
LM-86; Measuring Luminous Flux and Color Maintenance of Remote Phosphor Components

5. Restriction of Hazardous Substances (RoHS):

RoHS 3; Directive 2015/863 - Cat 5. Lighting: lamps, luminaires, light bulbs.

1.03 SYSTEM DESCRIPTION

- A. Provide and install a fully functional and operating lighting system as indicated, complete with light engines, lamps, wiring, and securely attached to support system to meet all seismic code requirements.
- B. Where catalog number and narrative or pictorial descriptions are provided, the written description shall take precedence and prevail.

1.04 SUBSTITUTIONS

- A. Refer to Section 260010: Basic Electrical Requirements for specific Equipment requirements.
- B. Items specified under this Section and Luminaire Schedule are subject to the requirements, with the following qualifications:
  - 1. Items solely specified by Manufacturer name and catalog number, without qualifiers: Provide as specified – No Substitutions.
  - 2. Items specified by multiple Manufacturers, without qualifiers: Provide any listed manufacturer – No Substitutions.
  - 3. Items specified by sole or multiple Manufacturers, followed by “Or Approved Equal” or “Or Approved Equivalent”: Conform to substitution requirements outlined for Equipment.
  - 4. Items specified by sole or multiple Manufacturers, followed by “Or Equal” or “Or Equivalent”:  
Products that meet the salient requirements are acceptable to provide.
    - a. Equivalency is at the sole judgement of the Architect and Engineer.
    - b. Should a submitted, unspecified product fail to meet the requirements of Equivalency, provide specified products at no additional cost to the Owner.
- C. Equivalency shall be determined by review of the following luminaire characteristics where applicable. Lack of pertinent data on any characteristic shall constitute justification for rejection of the submittal or substitution.
  - 1. Performance:
    - a. Distribution.
    - b. Utilization.
    - c. Luminance distribution (Average brightness / maximum brig



4. Maintenance:
  - a. Ease of relamping / replacement of LED array.
  - b. Ease of replacement of driver/ballast and lamp sockets.
5. Appearance:
  - a. Architectural integration.
  - b. Light tightness.
  - c. Styling.
  - d. Conformance with design intent.
  - e. When requested, furnish a working sample complete with housing, trim, 8' cord and plug, and specified lamp.

#### 1.05 SUBMITTALS

- A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements, the following items:
  1. Complete bill of material listing (index) of all luminaires. Index shall be organized in the same sequence as the Luminaire Schedule (alphabetical.) Include in the index:
    - a. Type per the Luminaire Schedule.
    - b. Manufacturer.
    - c. Complete catalog number, including all accessories and appurtenances required for the installation.
    - d. Voltage.
    - e. Poles, arms, and brackets, if applicable.
    - f. Lamping, if applicable.
  2. Manufacturer's data sheets/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
    - a. Identify luminaire type on each sheet.
    - b. Clearly mark on each data sheet the specific item(s) being submitted. Obfuscate or otherwise delete options on data sheets that are not provided.
  3. Driver or transformer and/or lamp data sheets as applicable to submitted item.
  4. Manufacturer's installation instructions.
  5. Warranty.

6. U.L. labeling information.
7. Photometric Reports consisting of:
  - a. Independent Testing Laboratories, Inc. or equal, photometric test report for each luminaire listed on the Luminaire Schedule. Test reports shall be based on Illuminating Engineering Society published test procedures and shall contain candlepower distribution curves in five lateral planes for luminaires with asymmetric distributions and luminance data for vertical angles above 45 degrees from nadir.
  - b. Coefficient of utilization table.
  - c. Zonal lumen summary including overall luminaire efficiency.
8. Shop Drawings:
  - a. Where noted in the Luminaire Schedule, submit Shop Drawings from Manufacturer detailing modified or custom luminaires indicating dimensions, weights, methods of field assembly, components, features, accessories, methods of support, etc.

#### 1.06 OPERATION AND MAINTENANCE MANUAL

- A. Supply operation and maintenance manuals in accordance with the requirements of Section 260010: Basic Electrical Requirements, to include the following:
  1. An updated index per 1.05-A.
  2. One complete set of final submittals of actual product installed, including product data and shop drawings.
  3. Instructions for routine maintenance.
  4. Pictorial parts list and parts number.
  5. Telephone numbers for authorized parts and service distributors.

#### 1.07 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

#### 1.08 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery: Luminaires shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.
- B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.

- C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

1.09 WARRANTY

- A. Units and components offered under this Section shall be covered by a 1-year parts and labor warranty for malfunctions resulting from defects in materials and workmanship. Warranty shall begin upon acceptance by the Owner.

2.01 MANUFACTURERS

- A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.
  - 1. Luminaires, Poles, and Exit Signs: as listed in the Luminaire Schedule.
  - 2. Light-Emitting Diode (LED) Arrays:
    - a. Cree.
    - b. Nichia.
    - c. Citizen.
    - d. Lumileds.
    - e. Samsung.
    - f. Lumenetix Araya.
    - g. Xicato.
    - h. Bridgelux.
    - i. LEDs provided by Luminaire Manufacturer listed in the Luminaire Schedule: meeting the technical and warranty requirements of this Section.
  - 3. LED replacement and integral-driver lamps:
    - a. General Electric.
    - b. Osram.
    - c. Cree.
    - d. Maxlite.
    - e. Green Creative.
    - f. Soraa.
  - 4. LED drivers (DC output):

- a. eldoLED.
- b. Lutron.
- c. Signify Advance.
- d. Osram.
- e. Q-Tran.
- f. Universal Lighting Technologies.
- g. Drivers provided by Luminaire Manufacturer listed in the Luminaire Schedule: meeting the technical and warranty requirements of this Section.

5. Unit battery equipment:

- a. Philips Bodine.
- b. Myers/Iota.
- c. Unit battery equipment provided by Luminaire Manufacturers listed in the Luminaire Schedule: meeting the technical and warranty requirements of this Section.

B. Substitutions: Under provisions of Section 260010: Basic Electrical Requirements.

2.02 GENERAL

- A. Luminaires new and complete with mounting accessories, junction boxes, trims, and lamps.
- B. Luminaire assemblies U.L. listed approps, anprops, anprops,ire asse7OB71b0 10.473e1e(. l)-172 76da

- B. Extruded Aluminum Housings: One-piece housing of AA 6063 T5 extruded aluminum with 0.14 minimum thickness smooth and free of tooling lines in one uninterrupted section of 1-foot to 24-foot with the cross sectional dimensions as indicated in the Luminaire Schedule.
- C. Die-Cast Aluminum Housings:
  - 1. Single-piece casting to ensure water tightness.
  - 2. Low copper (<0.7% Cu) aluminum alloy.
  - 3. Minimum Class 4 Consumer Grade per NADCA Standards.
- D. All surfaces shall be cleaned and dressed to eliminate all exposed sharp edges or burrs.
- E. All intersections and joints shall be formed true and of adequate strength and structural rigidity to prevent any distortion after assembly.
- F. End Plates: Die cast end plates shall be mechanically attached without exposed fasteners. End caps shall be minimum 0.125" thick.
- G. All mitered corners or joints shall be accurately aligned with abutting intersecting members. Sheet metal Work shall be properly fabricated so that planes will not deform (i.e. become concave or convex) due to normal expected ambient and operating conditions.
- H. Ferrous mounting hardware and accessories shall be finished using either a galvanic or phosphate primer/baked enamel process to prevent corrosion and discoloration of adjacent materials.
- I. Fasteners shall be manufactured of galvanized steel.
- J. Adjustable Lamp Mechanisms: To have aiming stops which can be permanently set to position lamp vertically and rotationally.
- K. Recessed luminaires: Equip with through-wire junction box. Box, driver, and replaceable components shall be accessible from the ceiling opening of the luminaire.
- L. Finish:
  - 1. All exposed aluminum surfaces shall be treated with an acid wash and clear water rinse prior to painting. The luminaire shall then be electrostatically painted, or powder coated, and oven baked in the color indicated in the Luminaire Schedule.
  - 2. All exposed steel surfaces shall be treated with an acid wash and clear water rinse, then prime coated. The luminaire shall then be electrostatically painted, or powder coated, and oven baked in the color indicated in the Luminaire Schedule.
- M. Door Frames for lensed luminaires: White painted, flat aluminum with mitered corners.

## 2.04 SUSPENSION

- A. Suspension Devices, type as specified in the Luminaire Schedule:
  - 1. Aircraft Cable: Stainless steel type - 3/32" nominal diameter, stranded, with positive pressure, field adjustable clamp at luminaire connection.

2. Rigid Pendant: ½" nominal diameter or as specifically shown on drawings. Supplied by luminaire manufacturer when available as standard product. At luminaire end of stems, provide

2. Bi-Pin base: Ceramic casing with mica cover plate, copper allow contact surfaces. Pin distance designed for lamp provided.

#### 2.06 LED ARRAYS

- A. Minimum lumen maintenance per LM-80 measurements and TM-21 calculations: L90 at 60,000 hours.
- B. Maximum burnout: B90 at 200,000-hours.
- C. Free of mercury and toxic materials; RoHS compliant.
- D. Linear LED boards: LED pitch shall be consistent throughout the luminaire and shall remain consistent from the end of one board to the start of the next. LED pitch shall be the same from the endcap of the luminaire to the last LED on the board as the LED pitch throughout the luminaire. Luminaire shall have a continuous luminous appearance – bright or dark spots are not acceptable.
- E. White LEDs:
  1. Interior
    - a. Correlated Color Temperature (CCT): 4000K
    - b. Minimum efficacy: 75 lumens per watt.
    - c. L70 lifetime: minimum 80,000-hours (extrapolated.)
    - d. Correlated Color Temperature (CCT); as specified in Luminaire Schedule. Maximum 3-step MacAdam ellipse variation throughout listed life (L70).
    - e. Color Rendering Index (CRI); minimum 80 Ra.
    - f. R9 value; minimum 30.
    - g. TM30 values; Rf >75, 92>Rg>110.

#### 2.07 LED DRIVERS:

- A. LED drivers shall be integral to luminaire housing or remotely located, when specified, within 15 feet of diode assembly.
  1. Luminaires shall be provided with the UL listed or equivalent driver and low voltage power supply as recommended by Manufacturer to insure proper and consistent lamp and luminaire performance. The number of LEDs per luminaire per power supply shall not be exceeded, and LEDs shall not be wired to a high capacity driver unless recommended by Manufacturer.

5. All control gear shall facilitate smooth, flicker-free dimming from 100% to 10%, 1% or 0.1% as noted on the Luminaire Schedule.

## 2.08 LENSES

### A. Acrylic:

1. Lenses shall be extruded or injection molded crystal clear 100% virgin acrylic (except as indicated otherwise). For lenses with male pattern of pyramids or cones, specified minimum thickness refers to distance from flat surface to base of pyramids (cones) or thickness of undisturbed material. For lenses with female pattern, specified minimum thickness refers to overall thickness of material.
2. Lenses shall fully eliminate lamp images when viewed from all directions within 45 to 90-degree angles from vertical, where the ratio of lamp spacing to the distance from lamp underside to top of lens does not exceed 1.50. Within the viewing angle from 0 to 45-degrees the ratio of maximum brightness (under a lamp) to minimum brightness (between lamps) shall not exceed 3 to 1.
3. Finishes (i.e. sandblasting, etching, polishing) shall be performed as described in the Luminaire Schedule.
4. Plastic electrical light diffusers must meet the requirements of Section 2-5209, CAC, Flame Spread Rating.
5. Prismatic Acrylic:
  - a. Extruded of clear virgin acrylic plastic, 0.125" minimum overall thickness, 0.100" nominal unpenetrated thickness, Pattern 12 with flat sided female prisms running at 45 degrees off panel axis unless otherwise specified in the luminaire schedule. Concave prisms are not acceptable.
6. Opal acrylic:
  - a. Extruded or injection molded of virgin acrylic plastic, 0.080" minimum overall thickness.

## 2.09 REFLECTOR CONES

- A. Reflector cones shall be manufactured of uniform gauge, not less than 0.032" thick, high purity aluminum, Alcoa 3002 alloy, free of spin marks or other defects or blemishes caused during manufacturing.
- B. The finish on the inner surface of the reflector shall be as described in the Luminaire Schedule and as produced by the Alzak process. The reflector shall have an anodic coating of not less than four mils thick. The reflector inner surface shall be free of water spotting and shall maintain a reflectivity ratio of not less than 83% on clear specular finishes. The reflectors shall have a low iridescence finish.
- C. All luminaires using Alzak reflector cones shall be supplied by the same manufacturer unless directed otherwise in Luminaire Schedule.



- D. Provide 45-degree lamp and lamp imaging cut-off unless otherwise specified in the Luminaire Schedule. Where upper reflector is separated from cone, cut-off shall be 45-degrees unless otherwise noted.
- E. Plastic materials shall not be used for reflector cones or aperture plate materials.
- F. Luminaires in which reflector cones are riveted or welded to the housing or where removal of the cone requires pressure to be applied to the finished surface of the reflector shall not be acceptable.
- G. Cone flange shall be formed as an integral part of the cone and shall have identical color and finish as the cone, except when specified otherwise in the Luminaire Schedule. The flange major surface shall be perpendicular to the cone axis. The width of the flange shall adequately cover the ceiling opening without light leaks. No luminaire parts (housing, mounting frame, etc.) shall be visible between the ceiling surface and the edge of the cone flange.
- H. Reflector cone retention devices shall not deform the cone in any manner.

## 2.10 UNIT BATTERY EQUIPMENT

### A. LED Emergency Power Supplies

- 1. Standard Features:
  - a. Safety compliance to UL 924; CAN/CSAC22.2 No.141-10 and NFPA requirements for 90-minute egress
  - b. Open circuit / short circuit protection
  - c. Operating temperature: 32-degree F/0-degree C to 122-degree F/50-degree C
- 2. Test switch / charging indicator light
- 3. Emergency reaction time < 1-sec
- 4. Powder coat steel, stainless or galvan-nealed case
- 5. Field-replaceable NiCd battery pack (x2) with quick connect
- 6. Min. lead wire length: 6in UL 1452 solid / #18 AWG 1000volt / 90-degree C

## 3.01 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of luminaire installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

## 3.02 PREPARATION

- A. Architectural Plans shall govern exact ceiling construction and mounting conditions for all luminaires. Locate as shown on the architectural elevations and reflected ceiling plan.
- B. Consult Architectural Drawings for details of ceiling construction, finish, and other applicable details.





4. LED Modules:

3.07 IDENTIFICATION SYSTEM

- A. All concealed junction box cover plates for the lighting branch circuit system shall be clearly marked with a permanent black ink felt pen identifying the branch circuit (both panel designation and circuit number) contained in the box.

3.08 FIELD QUALITY CONTROL

- A. Visual and mechanical inspection:

SECTION 27 00 00  
COMMUNICATIONS BASIC REQUIREMENTS

## PART 1 - GENERAL

## 1.01 SUMMARY

- A. This Section specifies the common administration basic requirements and common methods for all low voltage systems installation work included under Division 27 and 28 and where those requirements differ from the requirements of this section, the more stringent shall govern.

## 1.02 STANDARDS, REGULATIONS, AND CODES REFERENCES

- A. The following Standards, Regulations and Codes apply to work specified in the Contract Documents.
1. Applicable State and Local Codes.
  2. California Building Code and California Electrical Code, Current Editions.
  3. BICSI TDMM (Telecommunications Distribution Methods Manual), 11th Edition 2006.
  4. ANSI/TIA/EIA-568-B.1. Commercial Building Telecommunications Cabling Standard,
  5. ANSI/TIA/EIA-568-B.1-2. Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements, Addendum 2, Grounding and Bonding Specifications for Screened Balanced Twisted-Pair Horizontal Cabling.
  6. ANSI/TIA/EIA-568-B.1-3. Commercial Building Telecommunications Cabling Standard.
  7. ANSI/TIA/EIA-568-B.1-4. Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements, Addendum 4, Recognition of Category 6 and Category Cat 6A and 50 nm Laser-Optimized 50/125 um Multimode Optical Fiber Cabling.
  8. ANSI/TIA/EIA-568-B.1-2. Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components.
  9. ANSI/TIA/EIA-568-B.2-1. Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components, Addendum 1, Transmission Performance Specifications for 4-Pair 100 Ohm Category 6 Cabling.
  10. ANSI/TIA/EIA-568-B.2-10 (draft 2.0). Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components, Addendum 10, Transmission Performance Specifications for 4-Pair 100 Ohm Augmented Category 6 Cabling.
  11. ANSI/TIA/EIA-568-B3.3 Optical Fiber Cabling Components Standard.
  12. TIA-569-B. Commercial Building Standard for Telecommunications Pathways and Spaces.
  13. ANSI/TIA/EIA-606-A. Administration Standard for Commercial Telecommunications Infrastructure.
  14. ANSI/TIA/EIA-607-A. Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.

15. TIA/EIA TSB-67 Transmission Performance Specifications for Field Testing of Unshielded Twisted-Pair Cabling Systems.

16. TIA/EIA TSB-72 Centralized Optical Fiber Cabling Guidelines.

1.03 DEFINITIONS

- A. The following is a list of abbreviations generally used in Divisions 27 & 28:
1. ADA - Americans with Disabilities Act
  2. AHJ - Authority Having Jurisdiction
  3. ANSI - American National Standards Institute
  4. APWA - American Public Works Association



25. Pathway: Facility for the placement of communications cable. A pathway facility can be composed of several components including conduit, wireway, cable tray, surface raceway, underfloor systems, raised floor, ceiling support wires, etc.
26. Protectors: Electrical protection devices used to limit foreign voltages on metallic communications circuits.
27. Raceway: An enclosed channel designed expressly for holding wires or cables; may either be conductive metal or insulating plastic. The term includes conduit, tubing, wireway, underfloor raceway, and surface raceway; does not include cable tray.
28. Rack: An open or enclosed structure, typically made of aluminum or steel, used to mount equipment; usually referred to as an equipment rack. May be freestanding and floor mounted or a wall mounted cabinet. Industry standard 19" width spacing.
29. Wiring Block: Punch down terminating equipment used to develop twisted pair cross-connect facilities.

#### 1.04 PRODUCT AVAILABILITY

- A. Products with long lead times are to be brought to the attention of the project manager.

#### 1.05 PRODUCT SUBMITTALS

- A. See Division 01 Submittals for more requirements

#### 1.06 SUBSTITUTION LIMITATIONS

- A. Equivalent product(s) may be considered for substitution for those products specified, however, the equivalent product(s) must be approved, and show demonstrated and documented equivalence to the product(s) specified. Documentation includes but is not limited to product samples, data sheets, and actual test data. The request for product substitution, and supporting documentation, must be submitted, in writing to the Project Manager/Designer.
- B. See Division 01 Substitutions for more requirements

#### 1.07 QUALITY ASSURANCE

- A. Conform to requirements of the CEC, latest adopted version with amendments by local AHJs.
- B. Conform to the latest adopted version of the CBC with amendments by local AHJs.
- C. Obtain and pay for electrical permits, plan review, and inspections from local AHJs.
- D. Furnish products listed by UL or other testing firm acceptable to AHJ.



- E. Conform to requirements of the serving electric, telephone, broadband and cable television utilities.
- F. Contractor Qualifications:
  - 1. Minimum of five years' experience in the design, installation, testing, and maintenance of low-voltage systems.
  - 2. Maintain a local service facility which stocks spare devices and/or components for servicing systems.
  - 3. Have performed successful installation and maintenance of at least three projects similar in scope and size. Be able to provide project references for these three projects, including scope of Work, project type, owner/user contact name and telephone number.
  - 4. The contractor selected for this project must be certified by the manufacturer of the products and utilize these components for completion of work.
  - 5. Holds and maintains a valid California C-7 or C-10 State Contractors License and can exhibit validity upon request.
  - 6. A list of test equipment proposed for use in verifying the installed integrity of copper and fiber optic cable systems used.
  - 7. A technical resume of experience for the contractor's Project Manager and on-site installation supervisor who will be assigned to this project.
  - 8. A list of technical product training attended by the contractor's personnel that will install the specified manufacturer system.
  - 9. List of Sub-Contractor(s) who will assist the contractor in the performance of this work.

#### 1.08 SEQUENCING AND SCHEDULING

- A. For the proper execution of the work, cooperate with other tradecrafts and contracts as needed.
- B. To avoid installation conflicts, thoroughly examine the complete set of Contract Documents. Resolve conflicts with Project Manager/Designer prior to installation.
- C. Prior to installation of communications cable to equipment requiring connections, examine the manufacturer's shop drawings, wiring diagrams, product data, and installation instructions. Verify that the electrical characteristics detailed in the Contract Documents are consistent with the electrical characteristics of the actual equipment being installed. When inconsistencies occur request clarification from Project Manager/Designer.

#### 1.09 SHOP DRAWINGS

- A. Shop Drawings: When required by individual Specification Sections, provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, point-

to-point wiring diagrams for all connections, and the like. Refer to individual Specification Sections for additional requirements for the shop drawings.

#### 1.10 WARRANTY

- A. Provide an extended manufacturer's warranty on the Backbone and Horizontal Communications systems as specified in other sections of Division 27.

#### 1.11 CLOSE OUT DOCUMENTS

- A. Final coordination drawings, with as-built information added, are to be submitted as record drawings at completion of project.
- B. Record Drawings:
  - 1. Show changes and deviations from the Construction Drawings. Include written Addendum and change order items.
  - 2. Show exact routes of pathway facilities and service entrance conduits.
  - 3. Show the exact location of racks, cabinets, mounting frames and the like.
- C. Operation and Maintenance Documentation: Provide copies of certificates of code authority acceptance, product data, guarantees, warranties, installation guides, maintenance guides and the like.
- D. Inspection and/or testing: Submit testing reports for testing that was performed.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Provide like items from one manufacturer, such as wire/cable, jacks, modular plugs, patch panels, equipment connection cords, wall plates, and the like. See individual sections for detailed information.

### 2.02 MATERIALS

- A. Provide new electrical materials of the type and quality detailed, listed by UL, bearing their label wherever standards have been established. Indicated brand names and catalog numbers are used to establish standards of performance and quality.
- B. Provide material and equipment that is acceptable to AHJ as suitable for the use indicated. For example, provide plenum rated cable in ceilings that are utilized as air return plenums.
- C. Include special features, finishes, accessories, and other requirements as described in the Contract Documents regardless of the item's listed catalog number.
- D. Provide incidentals not specifically mentioned herein or noted on Drawings, but needed to complete the system, in a safe and satisfactory working condition.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

#### A. Construction Documents:

1. Drawings are diagrammatic with symbols representing communications equipment, outlets, and wiring.
2. Electrical symbols indicating wiring and equipment shown in the Contract Documents are included in the Contract unless specifically noted otherwise.
3. Examine the entire set of Drawings to avoid conflicts with other systems. Determine exact route and installation of communications wiring and equipment with conditions of construction.

### 3.02 INSTALLATION

- #### A. Install communications equipment completely as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of the communications equipment, examine the instructions thoroughly. When requirements of the installation instructions conflict with the Contract Documents, request clarification from

- C. Vacuum clean interiors of new and modified electrical signal and communication equipment enclosures.

END OF SECTION

SECTION 27 05 00  
COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. This section specifies the basic materials and methods for all low voltage pathways installation work included under Division 27 and 28 and where those requirements differ from the requirements of this section, the more stringent shall govern.
- B. This section adds refinements to Division 26 that apply to Communications and extra-low-voltage systems.

1.02 SCOPE

- A. Materials and/or methods for the following.
  - 1. Communication services
  - 2. Grounding
  - 3. Fasteners
  - 4. Hangers and supports
  - 5. Conduits/Backboxes/Raceways
  - 6. Underground
  - 7. Sleeves and penetrations

1.03 SUBMITTALS

- A. Submittals shall be done in accordance with District submittal procedures, see Division 01 Submittals for requirements.

1.04 RELATED REQUIREMENTS

- A. Division 07 – Thermal and Moisture Protection
- B. Division 26 – Electrical
- C. 27 00 00 – Communications Basic Requirements

1.05 REFERENCES

- A. ANSI American Nation Standards Institute



## PART 2 – PRODUCTS

2.01 All products used on this project shall bear the label and be approved by Underwriters Laboratories unless otherwise approved in writing by District.

## 2.02 FASTENERS

A. Mounting hardware and anchors recommended by the manufacturer of any material that shall be mounted to the building or structure.

1. Sheet rock / drywall / wall board: Easy Anchor, toggle bolt, other spread type anchor with load distribution, or approved equal.
2. Concrete / cinder block / solid masonry: Expanding compression type lag, expanding compression type bolt, expanding compression type, all-thread with nuts, or approved equal.
3. Tile / Stucco / hollow masonry: Toggle bolts or approved equal.
4. Wood: Lag screws, wood screws, or approved equal.
5. Metal: Beam clamps, sheet metal screws, self-drilling screws or approved equal.

## 2.03 HANGERS AND SUPPORT

## A. D-RINGS

1. Commercial grade



3. All new conduits shall be sized accordingly to achieve a 40% maximum fill ratio with initial cables installed.
4. Underground conduits shall be Schedule 40 PVC.

B. INNERDUCT

1. Orange corrugated HDPE (High Density Polyethylene) Innerduct shall be used for fiber optic cable protection in interior locations.
2. Fabric multi-cell innerduct is approved for underground conduits 2" and larger.

C. FITTINGS:

1. See Division 26 for requirements.
2. Conduit bodies and any sharp bend fittings are strictly prohibited for communication Cat6A and fiber optic cables. Appropriate conduit sweeps are required.

D. PULL LINE

1. Minimum 1/8" diameter, or larger braided line of polypropylene or continuous fiber polyolefin. The minimum breaking strength of 1/8 in. line is 200 lbs.

2.06 BACKBOXES, JUNCTION BOXES AND FLOOR BOXES

- A. Galvanized one-piece or welded pressed steel type. Boxes for fixtures shall not be less than 4" square and shall be equipped with fixture stud. Boxes shall be at least 2-1/8" deep, 4" square for 1 or 2 gang devices, with device rings. Boxes mounted in wall or ceiling finished with 5/8" gypsum board shall be furnished with 5/8" deep device rings. Provide blank cover for all boxes without fixture or device.
- B. Junction boxes, larger than 8", located indoors shall be hinged, NEMA-1 rated.
- C. Junction boxes, larger than 8", located outdoors, or in wet or damp locations shall be hinged, NEMA-3R.

2.07 GROUND0EJN8GRADEER LOBBY SECURITY UPGRADE

## PART 3 - EXECUTION

## 3.01 COMMUNICATION SERVICES

- A. Install inground boxes, conduits, and terminal cabinets per service provider requirements.

## 3.02 GROUNDING

- A. Ground fittings shall be UL approved for each application and installed and/or connected to system in accordance with current CEC Code requirements.
- B. See Division 26 for additional requirements.
- C. Install grounding bus bar per manufacturer's instructions and to be in each MDF and IDF.

## 3.03 HANGERS AND SUPPORTS

- A. Install hangers and supports per manufacturer's written instructions.
- B. Hanger spacing shall be 48" or less and within 12" of sleeves and/or junction/back boxes.

## 3.04 LOW VOLTAGE PATHWAY/RACEWAYS

- A. EMT conduit may be used at following locations (see Division 26 for exact requirements):
  - 1. In dry locations in furred spaces.
  - 2. In partitions other than concrete or solid masonry.
  - 3. In protected exterior locations not exposed to direct weather.
- B. Rigid steel conduit and fittings shall be used for vertical risers and on top of all roofs, overhangs, walkways, canopies, or any other location exposed to direct weather. See Division 26 for exact requirements.
- C. Furnish and install pull lines in all unused (empty) conduits or raceways. All pull lines shall be permanently tagged with identification at both ends.
- D. Install exposed conduit neatly, parallel to or at right angles to structural members. Maintain a minimum of 12 inches of clearance from steam or hot water pipes. All installed strut channel supports should allow for future conduit attachments. The width of strut channel to match the width of the closest attached junction box. See design document details for attachment requirements.
- E. Supports: Support conduit with two-hole straps or strut channel where shown in design documents and/or specified. Coordinate supports with architectural details. Secure to wood

structure by means of bolts or lag screws, to metal by means of shallow self-tapping screws, to concrete by means of insert or expansion bolts, to brickwork by means of expansion bolts, and to hollow masonry or stucco by means of toggle bolts.

- F. Spacing for all EMT and rigid steel conduit supports shall be as follows unless otherwise specified in design documents details:
  - 1. Surface conduit spacing and supports and unless otherwise specified or shown on drawing details:
    - a. EMT – Size 3/4" to 2" – 4' maximum spacing (3 each supports per 10' conduit length) and 12" from each end of conduit at coupling, connector or 90-degree bend.
    - b. Rigid steel – Size 3/4" to 2" – 4' maximum spacing (3 each supports per 10' conduit length) and 12" from each end of conduit at coupling, connector or 90-degree bend.
- G. If conduit is designated for low voltage use, no more than a total of 360 degrees of conduit bend radius will be allowed between pull boxes.
- H. All junction boxes shall be connected to conduits using appropriate connecting hardware (i.e. box connectors).
- I. Clean, prep and paint with white primer all exposed conduit, junction boxes, channel strut, fittings, and accessories.
- J. Before pulling any conductors into an underground PVC conduit (new or existing), the conduit shall be first be proofed by pulling through a mandrel of a diameter ¼ in. smaller than the conduit inside dia., followed by a swab of the same diameter as the conduit inside diameter.
- K. Non-metallic raceway to be installed with mechanical fasteners only, do not remove adhesive tape backing.
- L. Capping
  - 1. Cap conduits during construction with manufactured seals. Swab out conduits before installing wires.
  - 2. Cap all empty conduits below grade and in pull boxes with manufacturer's caps to prevent entrance of debris, attach pull string to cap.

## M. Underground Conduit

1. Service provider conduits shall be:
  - a. AT&T - 1-4" (fiber only) or 2-4" (fiber and copper)
  - b. Comcast - 1-2"
2. #10 tracer wire or tracer tape is required for all underground Division 27 PVC conduits.

## 3.05 J-BOXES

- A. Screws shall be used to attach boxes, and must be accurately placed for finish, independently and securely supported by adequate wood backing or by manufactured adjustable channel type heavy-duty box hangers.
  1. Boxes shall be attached to metal studs with metal box hangers.
  2. Boxes installed in masonry tile or concrete block construction shall be secured with auxiliary plates, bars or clips and be grouted in place.
- B. Locate outlets at the following heights unless otherwise noted on Drawings, Specifications, current CBC or as required to meet ADA handicap requirements.
  1. Data Outlets: Same height as electrical outlets
  2. Telephone Wall Outlets: Above counter/backsplash height or at electrical switch height.
- C. Boxes shall be placed within 18" of electrical outlets.
- D. For sound control, separate outlets on opposite sides of walls 16" minimum. Where outlets

- C. Install a 30" x 48" for service provider AT&T at service tie-in location and/or a 24" x 36" for service provider Comcast at service tie-in location. If less than 360-degrees of bends and less than 200 feet it is acceptable to stub in to the MPOE directly. If greater for 360-degree for bends or 200 feet for length then additional in-line ground boxes are required (30" x 48" for AT&T, 17" x 30" for Comcast). See section Part 2 – Products for more information.

### 3.07 SLEEVES AND CONDUIT PENETRATIONS

- A. Where conduit passes through walls, ceilings, or floors with connection points to junction boxes or raceways mounted to the same wall as the penetration provide a threaded conduit and secured in place with locking rings on both sides. Bend radius requirements shall be maintained where penetrations are made through the back of raceways; junction boxes with adequate depth shall be installed to comply with this requirement.
- B. Where conduit passes through walls, ceilings, or floors with connection points to junction boxes or raceways not mounted to the same wall as the penetration, provide EMT conduit and secured in place with strut channel. Box connects

- B. Clean and repair soiled or damaged painted exposed work and match adjoining work before final acceptance.
- C. Remove debris from inside and outside of equipment and enclosures.

3.09 FINAL DOCUMENT SUBMITTALS

- A. See 27 00 00 for more information.

END OF SECTION

SECTION 27 10 00

Structured Cabling

PART 1 – GENERAL

1.01 SUMMARY

- A. This section specifies equipment, accessories, materials, installation, configuration, and testing requirements for a complete and operable Structured Cabling communications system. The system shall provide highly reliable and high-performance data communication from main distribution frame (MDF) through each intermediate distribution frame (IDF) to end points requiring fiber optics and/or copper cabling and associated equipment.
- B. This section condenses sections 27 11 00 – Communications Equipment Room Fittings, 27 13 00 – Communications Backbone Cabling, 27 15 00 – Communications Horizontal Cabling and 27 16 00 – Communications Connecting Cords into one comprehensive section.

1.02 SCOPE

- A. The work will include but not be limited to the following objectives:



1.03 RELATED REQUIREMENTS

- A. Section 01 – General Requirements
- B. Section 27 00 00 – Communications
- C. Section 27 05 00 – Common Work Results for Communication Systems.

1.04 INDUSTRY GUIDELINES AND STANDARDS

- A. California Electrical Code (CEC) – Current adopted version
- B. California Building Code (CBC) – Current adopted version.
- C. ANSI/TIA-568.0-D – Generic Communications Cabling for Customer Premises.
- D. ANSI/TIA-568.1-D – Commercial Building Communications Cabling Standard Part 1: General Requirements.
- E. ANSI/TIA 568-C.2 – Balanced Twisted-Pair Telecommunications Cabling and Components Standards
- F. ANSI/TIA 568.3-D – Optical Fiber Cabling Components Standard
- G. ANSI/TIA-569-D – Commercial Building Standard for Telecommunications Pathways and Spaces.
- J. ANSI/TIA-606-B – Administration Standard for the Commercial Telecommunications Infrastructure.
- K. ANSI/JSTD-607-C – Commercial Building Bonding and Grounding (Earthing) Requirements for Telecommunications.

1.05 QUALIFICATIONS

- A. The contractor shall possess a California C7 or C10 license.
- B. The Contractor or Subcontractor shall have 5 years' documented experience.
- C. The Contractor and installers shall be certified by the product manufacturer.

1.06 SYSTEM REQUIREMENTS

- A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing data cable plan system.

1.07 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

- A. See section 27 00 00 for requirements.

1.08 SUBMITTALS

- A. See section 27 00 00 for requirements.

1.09 WARRANTY

- A. Refer to Division 01 Warranty section.
- B. See section 27 00 00 for additional requirements.
- C. 25-year manufacturer's warranty/certification required for all copper and fiber cable plant installations.

1.10 CLOSEOUT DOCUMENTS

- A. See section 27 00 00 for requirements.



1. Data = Blue color
  2. AP = Green color
  3. CCTV = Blue color
  4. Clock/Intercom = Yellow color
  5. Access Control = Black color
  6. Fire Alarm/Intrusion Alarm = Red color
- C. Data jacks system/color:
1. Data/default = White color
  2. AP = Green color
  3. CCTV = Blue color
  4. Clock/Intercom = Yellow color
  5. Access Control = Black color
  6. Fire Alarm/Intrusion Alarm = Red color
- D. All fiber optic cables and components shall be single single-mode OS2 rated.
- E. Fiber optic cable terminations shall be LC-Duplex style.

PART 3 – EXECUTION

3.01 ACCEPTABLE INSTALLERS

- A. The components making up the structure cabling system shall only be installed by Contractors who are qualified to install, service and maintain the system.
- B. Cable terminations (copper or fiber) shall be installed by manufacturer certified technicians.
- C. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience before the Bid Opening Date.

3.02 EXAMINATION

- A. The Contractor shall be required to visit the installation site(s) prior to job bidding. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for accurate bidding and performance of the Work.

B. UNDERGROUND ENTRANCE PATHWAY

8. Surge Protected Outlet Strips: Required in MDF rack. Mount surge protected outlet strips per Manufacturer's directions. Refer to details on the Drawings for mounting location.
9. Furnish and install UPS in bottom of MDF/IDF rack.

#### D. MDF/IDF GROUNDING

1. Refer to Section 27 05 00 Grounding for more requirements.
2. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 6 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.
3. Bond metallic equipment (including ladder rack) to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

#### 3.06 WORKMANSHIP

- A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.
- B. The District' Project or Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.
- C. Comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.
- D. Perform Work with persons experienced and qualified to produce workmanship specified.
- E. Maintain quality control over suppliers and Subcontractors.

#### 3.07 WIRE/CABLE (COPPER/FIBER OPTIC)

- A. Design, layout, size, and plan new cable runs as required.
- B. All wire and cable passing through metalwork shall be sleeved by an approved grommet or bushing.
- C. Conduit/raceway fill shall not exceed 40 percent of interior cross-sectional area( )JTJ ET Q q 1 0 0 1 0 241.703







DESCRIPTION	APPENDIX A – Pre-Approved Materials MFG	PART NUMBER
Rack Cabinet 7' (43U), 41" Deep	Chatsworth Products	Z4-21N-113C-C12
Wall Mount Cabinet 24" (12 RU) 30" Deep	Chatsworth Products	12419-724
Wall Swing Rack 40RU, 32" Deep	Middle Atlantic	SR-40-32
Zero Clearance Latch Kit	Middle Atlantic	DWRSR-ZL
CUBE-iT Fan Kit	Chatsworth Products	40972-001
20 AMP Power Strip	Chatsworth Products	12848-701
Standard Busbar	Chatsworth Products	10622-010
12" Ladder Rack 10'	Chatsworth Products	11275-712
Ladder Rack Triangular Support Bracket	Chatsworth Products	11746-712
Ladder Rack Wall Angle Support 12"	Chatsworth Products	11421-712
Ladder Rack Butt-Splice Kit	Chatsworth Products	11301-712
Ladder Rack Foot Kit	Chatsworth Products	11309-701
19" Horizontal Cable Manager	Ortronics	808004759
Patch Panel 24-port 1-RU (Black)	Ortronics	OR-SPKSU24
Patch Panel 48-port 2-RU (Black)	Ortronics	OR-SPKSU48
Patch Panel Cable Managem 143e		

STRUCTURED CABLING  
27 10 00 - 12

Cat6A Data Jacks (Yellow)	Ortronics	KT2J6A-44
Cat6A Data Jacks (Black)	Ortronics	KT2J6A-00
Cat6A Data Cable, Riser (White = default)	Superior Essex	6B-246-4A
Cat6A Data Cable, Plenum (White = default)	Superior Essex	6B-246-4B
Cat6A Data Cable, Riser (Blue = CCTV/Access Control)	Superior Essex	6B-246-2A
Cat6A Data Cable, Plenum (Blue = CCTV/Access Control)	Superior Essex	6B-246-2B
Cat6A Data Cable, Indoor/Outdoor (Black)	Superior Essex	6B-272-ER
Cat6A Data Cable, OSP (Black)	Superior Essex	04-001-A8
Cat6A Patch Cord (Blue)	Quiktron	576-A10-0xx (xx = length)
Cat6A Patch Cord (Green)	Quiktron	576-A20-0xx (xx = length)
Cat6A Patch Cord (Yellow)	Quiktron	576-A115-0xx (xx = length)
Cat6A Patch Cord (Black)	Quiktron	576-A135-0xx (xx = length)
Cat6A Patch Cord Slim 1' (Blue)	C2G	30125
Cat6A Patch Cord Slim 1' (Green)	C2G	30153
Cat6A Patch Cord Slim 1' (Yellow)	C2G	30167
Cat6A Patch Cord Slim 1' (Black)	C2G	30139
Cat6A Patch Cord Fiber Optic LIU 1-RU	Ortronics, Infinium	473999J2VF 1992705 cm f

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END OF SECTION

# DATA COMMUNICATIONS NETWORK EQUIPMENT

- A. Contractor shall be located within 50 miles or less from the project site to support 2-hour response time.
- B. Five years' experience installing data network equipment and systems.

1.05 SYSTEM REQUIREMENTS

- A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing data network infrastructure.

1.06 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

- A. See section 27 00 00 for requirements.

1.07 SUBMITTALS

- A. See section 27 00 00 for requirements.

1.08 WARRANTY

- A. Refer to Division 01 Warranty section.
- B. See section 27 00 00 for additional requirements.

1.09 CLOSEOUT DOCUMENTS

- A. See section 27 00 00 for requirements.

PART 2 - PRODUCTS

2.01 GENERAL

- A. See Appendix A at the end of this document for pre-approved materials.
- B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.
- C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. Contractor shall provide all components needed for complete and satisfactory installation/operation.
- D. Product Availability

1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.
2. Subject to compliance with these specifications, products and systems included in this section are to be installed as specified by the manufacturer of the system or engineer approved equal.

## 2.02 EQUIPMENT

- A. The District's preferred manufacturer for:
  1. Routers - Cisco
  2. Firewalls - Cisco
  3. Networking Switches – Cisco
  4. Wireless Access Points - Cisco
  5. VoIP Phone Equipment – Cisco
  6. UPS – N1C
- B. Substitutions require proof of equivalence and approval by District and/or its representative.





- C. Comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

3.10 AS-BUILT DRAWINGS

- A. See section 27 00 00 for requirements.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
Network Switch (Catalyst 48port PoE)	Cisco	

SECTION 28 10 00  
ACCESS CONTROL SYSTEM

PART I - GENERAL

1.01 SUMMARY

- A. This section specifies equipment, accessories, materials, installation, configuration, and testing requirements for a complete and operable electronic Access Control system. The system shall provide electronic access to secure doorways to authorized persons at authorized time of day.

1.02 SCOPE

- A. The work will include but not be limited to the following objectives:
  - 1. Labor and Materials: The Contractor shall provide and pay for all labor, supervision, materials, accessories, components, equipment, tools, transportation, and other facilities and services necessary for the proper installation of a turn-key Access Control system to the District.
  - 2. The contractor will coordinate with the District in writing for any needed information (i.e. IP addresses, etc.) at least 2 weeks prior to the date the information is needed.
  - 3. Access Control software and equipment: Includes, but is not limited to:
    - a. Software based system for user authentication and system control
    - b. RFID cards/fobsed to:

6. Access control hardware shall continue to fully function in the event of communication loss to the central server.
7. Power to control panels shall be hardwired in conduit.
8. All door controllers shall have battery backup.

#### 1.03 RELATED REQUIREMENTS

- A. Division 01 – General Requirements
- B. Section 08 71 00 – Door Hardware
- C. Section 27 00 00 - Communications
- D. Section 27 05 00 – Common Work Results for Communication Systems.
- E. Section 27 10 00 – Structured Cabling
- F. Americans with Disability Act (ADA)

#### 1.04 REFERENCES

- A. See section 27 00 00 for requirements.

#### 1.05 DEFINITIONS

- A. See section 27 00 00 for requirements.

#### 1.06 SYSTEM REQUIREMENTS

- A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing Access Control systems and integrate into the Districts Avigilon ACM Enterprise installation.

#### 1.07 SUBMITTALS

- A. See section 27 00 00 for requirements.

#### 1.08 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

- A. See section 27 00 00 for requirements.



## PART 2 - PRODUCTS

## 2.01 GENERAL

- A. Manufacturers - See Appendix A at the end of this document for pre-approved materials.
- B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.
- C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. Contractor shall provide all components needed for complete and satisfactory installation and operation.
- D. Product Availability
  - 1. Contractor, prior to submitting a proposal, shall determine product availability and

2.03 EXTRA STOCK

- A. For each increment of 100 controlled doors furnish:
1. Quantity 5 of current model door controller.
  2. Quantity 7 of current model card reader.



### PART 3 - EXECUTION

#### 3.01 ACCEPTABLE INSTALLERS

- A. The equipment shall only be installed by Contractors who are qualified to install and maintain the system.
- B. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience installing electronic access control equipment before the Bid Opening Date.

#### 3.02 EXAMINATION

- A. The Contractor shall be required to visit the installation site(s) prior to bidding the job. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for observing and considering those conditions which a Contractor would have observed and considered during a site visit, estimating properly the difficulty and cost of successfully performing the Work or proceeding to perform the Work without additional cost to District.
- B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

#### 3.03 PREPARATION

- A. The Contractor shall verify materials are readily available prior to submitting product submittals and notify the District's Project Manager of long lead time items.
- B. The Contractor shall order all required parts and equipment only after receipt of approved product submittals from the District's Project Manager.
- C. Submit and receive approval shop drawings prior to work commencement.

#### 3.04 PATHWAY INSTALLATION

- A. New Construction:
  - 1. Install 3/4" EMT in wall from hollow door frame to double-gang mud-ring and deep 4" Sq. back box on interior latch side above door frame at 96" AFF to top of box to accessible ceiling space or continuous conduit to nearest IDF.
  - 2. Install on the exterior latch side of the door a single-gang mud-ring and back box for exterior card reader at 48" AFF to top of box. Route EMT conduit to above door 4"-Sq. j-box.
- B. Existing Construction:
  - 1. Refer to design documents.





APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
Door Controller (1-door)	Avigilon	AC-MER-CONT-LP1501
Door Controller (2-door)	Avigilon	AC-MER-CONT-LP1502
Door Controller (1-door/slave PoE )	Avigilon	AC-MER-CON-MR62E
2-Reader Interface Module	Avigilon	AC-MER-CON-MR52
Card Reader	Avigilon	AC-ING-READ-APTIO-SNG-MT15
Card Reader (Mullion)	Schlage	MT11-485
Power Supply/Cabinet (2 Door)	Avigilon	AC-LSP-2DR-MER-LCK
Power Supply/Cabinet (8 Door)	Avigilon	AC-LSP-8DR-MER-LCK
Video Intercom	Avigilon	3.0C-H4VI-RO1-IR
Electronic Surface Strike (rim style)	Assa Abloy/HES	9600
Electronic Surface Strike (rim style)	Von Duprin	6300
Electronic Latch Set (mortise)	Schlage	ND96EUPD
Latch Retraction Motor (Von Duprin)	Von Duprin	QEL
Latch Retraction Motor (Jackson)	Command Access	MLRK1-JAC12REX
Power Transfer	Von Duprin	EPT
Door Position Switch	George Risk Industries, Inc.	195-12WG
Battery 12VDC, 8AH	ELK, Powersonic	ELK-1280, PS-1280
Proximity Cards	Schlage	8520 - Serialized per District Requirements
Armored Door Loop	SDC	PT-3/8

]

END OF SECTION

SECTION 32 16 00

SITE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. SECTION INCLUDES:

1. The Section describes the requirements for providing portland cement concrete paving, including accessibility ramps,

treatments, coloring agents, sealers, fibers, cast-in-place accessories, forming and curing products and concrete mix designs.

D. With concrete submittal, provide documented history of mix design performance.

1.04 QUALITY ASSURANCE

A. Use only new materials and products.

B. Use materials and products of one manufacturer

may be waived in accordance with Section 1910A.2 when approved by the Structural Engineer and DSA.

1.08 ADEQUACY AND INSPECTION















the maximum

1. The expansion joints shall be full depth as shown in the plan details. Failure to do so will result in non-compliance and shall be immediately machine cut by the contractor at his expense.
- D. Stair Treads and Risers: Tool exterior stair tread nosing per ADA requirements and as detailed. Paint or stain tooled area at every stair tread nosing or as detailed. Stair tread nosing shall contain no pockets, voids or spalls. Patching is not allowed. Damaged nosing shall be replaced.

### 3.10 CURING

SITE CONCRETE  
32 16 00 - 12







2. Ameristar, Tulsa, OK  
Phone (888) 333-3422
3. Merchant Metals  
Phone (770) 741-0300  
211 Perimeter Way, Suite 250  
Atlanta, GA 30346
4. LOCINOX USA.  
Phone (877) 562-4669  
460 Windy Point Drive  
Glendale Heights, IL 60139

## 2.02 ORNAMENTAL PICKET FENCE

- A. Pickets: Square tubular members, ASTM A513, hot-rolled structural quality steel. 50,000 psi (310 Mpa) tensile strength, 60,000 psi (372 Mpa) yield strength. Minimum size pickets  $\frac{3}{4}$  inches square x 16 ga. Space pickets 3-15/16" maximum (100mm) face to face. Attach each picket to each rail with  $\frac{1}{4}$ " (6mm) industrial drive rivets. Size #4. Minimum gauge wall thickness solid gauge.
- B. Rails: "U" channels formed from hot-rolled structural steel having no pockets or shelves to hold water or moisture, 1-3/8" (35 mm) wide x 1-1/2" (38 mm) deep, 11-gauge (0.120" (3.05 mm) wall thickness. Punch rails to receive pickets and rivets and attach rails to rail brackets with 2 each,  $\frac{1}{4}$ " (6 mm) industrial drive rivets. Size #4. Steel for rail produced under ASTM A446. Provide top rail, bottom rail, and third rail 6" below top rail.
- C. Posts: Square tubular members, ASTM A500, hot-rolled structural quality steel, 50,000 psi (310 Mpa) Tensile strength, 60,000 psi (372 Mpa) yield strength, with ASTM A525 hot-dipped galvanized G90 coating. Minimum post size 4" sq., having minimum 12-gauge wall thickness. Post size at gates as required to support specified gate leaf size. Posts at all gates to receive LOCINOX hardware shall be between .2 inches and .313 inches thick.
- D. Accessories: post caps.
- E. Finish: After all steel components have been galvanized, clean and prepare the surface of all components to assure complete adhesion of finish coat. Apply 2.5 mil (0.0635) thickness of polyester





of panel to the support post shall not be greater than 4".

- H. Where touch up paint is necessary, paint shall match powder coated finish. Unacceptable finishes will require re-powder coating.

~~C. Provide twenty additional brackets to District.~~

END OF SECTION 32 31 19