Former Larimer School Gym/Auditorium
General Occupancy Project
135 Winslow Street

Project Manual

Tenant/Owner:

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« c/o Urban Redevelopment Authority»

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FORMER LARIMER SCHOOL GYM AND AUDITORIUM OCCUPANCY PROJECT
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DOCUMENT 000101 - PROJECT TEAM
PROJECT MANUAL
Former Larimer School Gym/Auditorium
General Occupancy Rehabilitation
135 Winslow Street

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SECTION 011000 – PROJECT SUMMARY

PART 1 - GENERAL

1.1 PROJECT INFORMATION

A. Project Identification:
   1. Project Location: 135 Winslow Street Larimer School Pittsburgh, PA

B. Owner (Master Lease Holder): Urban Redevelopment Authority

C. Architect: PFAFFMANN + ASSOCIATES

D. Architect's Consultants: Architect has retained the following design professionals who have prepared designated portions of the Contract Documents: See Project Team Page

E. The project program is to convert existing gym/auditorium and supporting spaces into a retail ready space (Coworking/market type tenants).

F. The Shell/Core scope of this work is to complete Toilet Rooms, HVAC, Electrical and finishes work in preparation for future tenants.

G. The Larimer Schools is funded by a number of state and local grants requiring compliance under RCAP and Historic Tax credit Regulations and requirments. This work is being funded by the PEIDC as the Master Lease Holder.

H. Work Under Separate Contracts: This is no other work within the former Gym-Auditorium wing.

1.2 WORK RESTRICTIONS

A. Contractor's Use of Premises: During construction, Contractor will have full use of building. indicated. Contractor's use of premises is limited only by Owner's right to perform work.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of Monday through Friday. Weekend Hours and Early Morning Hours: as per City of Pittsburgh by authorities having jurisdiction for restrictions on noisy work.

C. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications. See also RCAP and Historic Tax Credit special requirements which control in case of a conflict between construction documents and special requirements of contract.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Work Change Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.4 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: See Division 01 Section "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

B. Unit-Price Adjustment: See Division 01 Section "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:

1. Division 01 Section "Allowances" for procedural requirements governing the handling and processing of allowances.
2. Division 01 Section "Unit Prices" for administrative requirements governing the use of unit prices.
3. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
4. Division 01 Section "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.
5. Contract requirements Section for administrative requirements governing submittal of cost breakdown information required for RCAP and HISTORIC TAX CREDIT documentation.

1.2 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule

1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with continuation sheets.
b. Submittal schedule.
c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

a. Project name and location.
b. Name of Architect.
c. Architect's project number.

d. Contractor's name and address.
e. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.

4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.

9. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: Submit Application for Payment to Architect as a pencil copy one week before the owner’s meeting for approval. The period covered by each Application for Payment is one month, ending on the last day of the month.

D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Schedule of unit prices.
5. Submittal schedule (preliminary if not final).
6. List of Contractor's staff assignments.
7. List of Contractor's principal consultants.
8. Copies of building permits.
9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
10. Initial progress report.
11. Report of preconstruction conference.
12. Certificates of insurance and insurance policies.

I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.

3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707-1994, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Coordination drawings.
2. Requests for Information (RFIs).
3. Project Web site.
4. Project meetings.

B. Related Requirements:

1. Section 011200 "Multiple Contract Summary" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design; Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

1.4 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.5 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect and General Contractor.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

C. RFI Forms: AIA Document G716

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for coordination information already indicated in the Contract Documents.
    d. Requests for adjustments in the Contract Time or the Contract Sum.
    e. Requests for interpretation of Architect's actions on submittals.
    f. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect[**and Construction Manager**] in writing within [**10**] <**Insert number**> days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log Monthly with Application for payment

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect .
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.6 PROJECT WEB SITE

A. Use Architect's ot Contractor’s Project Web site for purposes of hosting and managing project communication and documentation until Final Completion. Project Web site shall include the following functions:

1. Project directory.
2. Project correspondence.
3. Meeting minutes.
4. Contract modifications forms and logs.

5. RFI forms and logs.
6. Task and issue management.
7. Photo documentation.
8. Schedule and calendar management.
9. Submittals forms and logs.
10. Payment application forms.
11. Drawing and specification document hosting, viewing, and updating.
12. Online document collaboration.
13. Reminder and tracking functions.
14. Archiving functions.

B. Contractor, subcontractors, and other parties granted access by Contractor to Project Web site shall execute a data licensing agreement in the form of AIA Document C106

1.7 PROJECT MEETINGS

A. General: Construction Manager will schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 5 days of the meeting.

B. Preconstruction Conference: Construction Manager will schedule and conduct] [Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner**,** Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing and long-lead items.
    d. Designation of key personnel and their duties.
    e. Procedures for processing field decisions and Change Orders.
    f. Procedures for RFIs.
    g. Procedures for testing and inspecting.
    h. Procedures for processing Applications for Payment.
    i. Distribution of the Contract Documents.
    j. Submittal procedures.
    k. Preparation of record documents.
    l. Work restrictions.
    m. Working hours.
    n. Owner's occupancy requirements.
    o. Responsibility for temporary facilities and controls.
    p. Procedures for moisture and mold control.
    q. Procedures for disruptions and shutdowns.
    r. Construction waste management and recycling.

s. Parking availability.
t. Office, work, and storage areas.
u. Equipment deliveries and priorities.
v. First aid.
w. Security.
x. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Progress Meetings: biweekly intervals.
1. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Progress cleaning.
10) Quality and work standards.
11) Status of correction of deficient items.
12) Field observations.
13) Status of RFIs.
14) Status of proposal requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.

2. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

END OF SECTION 013100

SECTION 013200 CONSTRUCTION PROGRESS DOCUMENTATION

A. SUMMARY

1 This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

a. Contractor's Construction Schedule.
c Submittals Schedule.
d Daily construction reports.
e Field condition reports.

2 See Division 1 Section "Payment Procedures" for submitting the Schedule of Values.

B. PAYMENT

1. No application for payment will be approved after application for payment No. 1, unless the contractor has an approved construction schedule that is acceptable to the Architect and/or Owner's Representative.

2. Subsequent application for payments will not be approved, unless the contractor updates his construction schedule in accordance with Section 1320 paragraph D.

C. SCHEDULING

1. When the building is occupied, coordination is required with the Architect and/or Owner's Representative prior to performance of designated Contract Work in the occupied portion of the building. The Architect and/or Owner's Representative reserve the right to schedule, reasonably reschedule and shift the necessary work areas at no additional cost based on the building occupancy schedule. It is expected that the Contractor shall adjust the installation plan and schedule to meet the Owner's requirements.

2. An overall coordination CPM Construction Schedule will be required on this project which will include the work and the responsibility of the Contractor and their sub-contractors.

3. It shall be the responsibility of all contractors to cooperate fully with the Contractor to create and update the CPM Construction Schedule as noted and/or required. The Final CPM Construction Schedule, including preliminary schedules and updates, will reflect the decisions of Contractors as to sequences, durations, construction logic, and all means and methods of construction. Contractors will provide persons of sufficient skill and information of sufficient detail and quality to update the schedule.

4. Preliminary Construction Schedule: Within fifteen (15) working days of the Notice to Proceed (NTP) the Contractor shall submit to the Architect and/or Owner's Representative a preliminary CPM type schedule showing their construction operations sequenced.

    1. The Contractor's plan schedule shall consist of, but not be limited to, the following:

        a. List of proposed construction activities.

        b. List of proposed duration for construction activities (in calendar days).

        c. List of proposed duration's for major procurement items (in calendar days).

d. Proposed sequencing of construction activities.

e. Construction activities that are not indicated in the Pre-Bid Schedule but are required for completing the Contract.

f. No activity shall have a duration greater than fifteen (10) work days.

g. All contract milestones shall be identified by separate activities.

h. Indicate date established for Substantial Completion.

2. In preparing the manual precedence diagram, each Contractor will be responsible for assuring that any/all subcontractor Work, as well as its own Work, is included and that the diagram shows a coordinated plan of Work.

3. Proposed duration's assigned to each activity shall reflect each Contractor's best evaluation of time required to complete this activity considering the scope and resources planned for the activity. Each activity shall include the estimated man hours needed to complete the work, the equivalent labor cost and approximate equipment and material costs.

5. Submittal Tabulation: With submittal of Preliminary CPM Construction Schedule, include tabulation by date of submittals required during the first 90 days of construction. List those submittals required to maintain orderly progress of the Work, and those required to be submitted early because of long lead time for manufacture or fabrication.

a. At Contractor's option, submittal dates may be shown on the schedule, in lieu of being tabulated separately.

6. Coordination of Preliminary CPM Construction Schedule Information: Contractors shall secure time commitments from his subcontractors, sub-subcontractors, material suppliers, etc. for performing construction activities. The Preliminary Construction Schedule shall be a comprehensive, integrated, fully developed CPM type schedule.

a. Show each construction activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work, including work restrained by other contractors.

b. A schedule extending beyond the contract time will not be acceptable.

c. A schedule showing the work completed in less that the contract time may be found by the Owners representative to be unacceptable. Any schedule showing early completion will not change the completion date in the Contract or accelerate the project.

d. A schedule found to be impracticable for any reason shall be revised by the Contractor and resubmitted.

e. A schedule showing the work completed in less than contract time, which is found to be practical by the Owner's Representative, shall be considered to have float. Float is the time between the scheduled completion of the work and the contract completion date. Float is a resource available to both the Owner and the Contractor for the beneficial completion of the project within the contract time.

f. No more than 15% of the activities shall be critical or near critical. Near critical is defined as float in the range of 1 to 10 work days.

7. Within ten (10) days after receipt of the project schedule, a joint review, correction, or adjustment of the proposed plan and schedule will occur with the Owner's Representative.

    a. The schedule will be revised in accordance with the agreements reached during the joint review.

    b. The approval of the first progress payment application will be contingent upon the Contractor's contribution to and acceptance of the project schedule. No contractor shall assert any claim whatsoever for any delay or additional cost incurred in connection with the development of the schedule.

    c. Approval or acceptance by the Architect and/or Owner's Representative of the Contractor's Final CPM Construction Schedule, or any revisions or updates, is advisory only and shall not relieve the Contractor of the responsibility for accomplishing each portion of the work within each and every applicable specified date. Omissions and errors in the approved or accepted Construction Schedule, or any revisions or updates shall not excuse performance which is not in compliance with the Contract. It is understood and agreed that Construction Schedule is to represent each Contractor's best plan and estimate for the Work; however, The Contractor acknowledges that the Construction Schedule may have to be revised from time-to-time as progress proceeds.

D. UPDATING THE CONSTRUCTION SCHEDULE

1. The Final CPM Construction Schedule for this project will be updated on a monthly basis for the purpose of recording and monitoring the progress of the Work. Activities scheduled to be started in the next work period may be checked on a weekly basis by the Architect and/or Owner's Representative at the regular project meetings.

2. Contractor shall prosecute their work so to maintain the progress in accordance with the approved CPM Construction Schedule, so no delays are caused to other Contractors engaged in the work. Should the Contractor fail to maintain progress according to schedule, the Contractor shall take measures necessary to bring progress of the Work into line with the CPM Construction Schedule and the other Contractors.

    a. Contractor shall be responsible to submit a detailed recovery plan at the Schedule Update Meetings for any activity that is behind the milestone dates set forth in the Contract.

3. Notwithstanding services to be provided by the Architect and/or Owner's Representative for the development of coordinated CPM Construction Schedule, it will be the sole responsibility of The Contractor to complete this project within the contract completion time allotted in the Bidding Documents as amended by approved extension of time.

4. A Contractor may request revisions to the logic sequence and precedence diagram in the event its planning for the Project is revised. If a Contractor desires to make changes in the project schedule to reflect revisions in its method of operating and scheduling, it shall notify the Owner's Representative in writing stating the reasons for the proposed revision and illustrating with a revised schedule that there is no impact to contract milestones.

    a. If a revision to the schedule logic sequence is contemplated, the Contractor shall so advise in writing at least two (2) weeks prior to the next schedule update, describing the revision and setting forth the reason therefore.

    b. Updating the project schedule to reflect actual progress made to date shall not be

considered revisions to logic sequence and schedule; in case of disagreements concerning actual progress to date, the Architect and/or Owner's Representative's determination shall govern.

5. Scheduling of changes in the Work is the responsibility of the Contractor. The Contractor shall revise the scheduling drawing to incorporate all activities involved in completing changes in the Work and submit it to the Architect and/or Owner's Representative for review.

6. If the Architect and/or Owner's Representative finds the Contractor is entitled to an extension of any completion date under the provisions of the contract, the total number of days extension will be based upon the current analysis of the schedule and upon the data relevant to the extension.

7. The Contractor acknowledges and agrees that delays to non-critical activities (those with float), will not be the basis for a time extensions. Float is defined as the difference between the early and late start dates of any activity.

8. If, according to the current updated schedule, the Contractor is 10 calendar days or more behind the contract completion date or any interim completion dates, considering all time extensions to which the Contractor is entitled, the Contractor shall submit a revised schedule, showing a workable plan to complete the project on time. The Architect and/or Owner's Representative may withhold 5% of progress payments until a revised acceptable schedule, is submitted by the Contractor.

E. SPECIAL REPORTS

1. Reporting Special Occurrences/Unusual events: When an event of an unusual and significant nature occurs at the site, Contractors shall prepare and submit a special report. List the chain of events, persons particularly, response by the contractor's personnel, an evaluation of the results or effects and similar pertinent information. Advise the Architect and/or Owner's Representative in advance when such events are known or predictable.

2. Contractor shall submit reports relating to a special occurrence directly to the Architect and/or Owner's Representative, and to other parties affected by the occurrence within one (1) day of the occurrence.

F. SUBMITTALS

1. Submittals Schedule: Submit three (3) copies of submittal schedule. Arrange the following information in a tabular format:

a Scheduled date for first submittal.
b Specification Section number and title.
c Submittal category (action or informational).
d Name of subcontractor.
e Description of the Work covered.
f Scheduled date for Architect's final release or approval.

2. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

a. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.

b. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

G. REPORTS

a. Daily Construction Reports: Prepare a daily construction report recording events at Project site, including the following:

i. List of subcontractors.
ii. High and low temperatures general weather conditions.
iii. Accidents.
iv. Stoppages, delays, shortages, and losses.
v. Meter readings and similar recordings.
vi. Orders and requests of authorities having jurisdiction.
vii. Services connected and disconnected.
viii. Equipment or system tests and startups.

b. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

END OF SECTION

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for submitting Applications for Payment.
2. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
3. Division 1 Section "Quality Requirements" for submitting test and inspection reports and Delegated-Design Submittals and for erecting mockups.
4. Division 1 Section "Closeout Procedures" for submitting warranties Project Record Documents and operation and maintenance manuals.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. General: Electronic copies of CAD Drawings of the Contract Drawings will be provided upon request by Architect for Contractor's use in preparing submittals.

1. Each drawing sheet will be available as a background layer only (no notes or dimensions), under a limited licensing agreement with Contractor, at a cost per sheet to be set by Architect. Contractor or subcontractor will verify dimensions. Architect will not be held responsible for the accuracy and exactness of electronic files.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.

1. Initial Review: Allow 14 calendar days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Concurrent Review: Where concurrent review of submittals by Architect's consultants, Owner, or other parties is required, allow 21 days for initial review of each submittal.

3. Direct Transmittal to Consultant: When Architect agrees that submittals may be transmitted directly to Architect's consultants, provide duplicate copy of transmittal to Architect. Submittal will be returned to Architect before being returned to Contractor.

4. If intermediate submittal is necessary, process it in same manner as initial submittal.
5. Allow 7 days for processing each resubmittal.
6. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

E. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Architect and Construction Manager.
    d. Name and address of subcontractor.
    e. Name and address of supplier.
    f. Name of manufacturer.
    g. Submittal number from Construction Manager’s Schedule of Submittals, including revision number.
    h. Number and title of appropriate Specification Section.
    i. Drawing number and detail references, as appropriate.
    j. Other necessary identification.

F. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

G. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction. No submittals marked “REVISE AND RESUBMIT” or “REJECTED” shall be sent to the job site.

K. Electronic data may, at the Architect’s sole discretion, be provided to the Contractor for the convenience of the Contractor in the preparation of shop drawings. Requests for electronic data must be made in writing using the Electronic Data Form included in this Specification.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Number of Copies: Submit one reproducible and two additional copies of each submittal, unless otherwise indicated. Architect will return reproducible copy only. Reproduce copies as required for distribution, including one as a Project Record Document.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless authorized otherwise.

D. Samples: Prepare physical units of materials or products, including the following:

1. Comply with requirements in Division 1 Section "Quality Requirements" for mockups.
2. Samples for Selection/Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected.
3. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. Attach label on unexposed side that includes the following:

a. Generic description of Sample.
b. Product name or name of manufacturer.
c. Sample source.

4. Number of Samples for Selection/Verification: Submit three sets of Samples. Architect will retain one Sample set; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.

    a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

5. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

E. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

F. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."

G. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."

H. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit three copies of each submittal, unless otherwise indicated. Architect will return one copy.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."

B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

J. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.

K. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

L. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

M. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

N. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."

O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing, operating, cleaning or maintaining a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

Q. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections.

R. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action and Informational Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. NO EXCEPTIONS TAKEN: No corrections, no marks.

2. MAKE CORRECTIONS NOTED: Resubmission not required. Minor amount of corrections; all items can be fabricated without further corrections to original drawing; checking is complete and all corrections are deemed obvious without ambiguity.

3. REVISE AND RESUBMIT: Resubmission required. Minor amounts of corrections; noted items must not be fabricated without further corrections of original drawing; checking is not complete; details of items noted are to be clarified further before full approval can be given. Submit new reproducible copies.

4. REJECTED: Drawing is rejected as not in accord with Contract, too many corrections, or other justifiable reasons. When returning drawing, Architect will state reasons for rejection. Correct and resubmit new reproducible copies. Do not fabricate.

C. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

REQUEST FOR SUBSTITUTION

APPROVED FOR SUBMITTAL BY: _____
DATE

SUBMITTED TO: _____, Architect

SPECIFIED ITEM: _____ DESCRIPTION: _____
Spec. Section or Drawing No.

A. The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: _____

REASON FOR SUBSTITUTION: _____

The proposed substitution differs from the specified item as follows: _____

_____

B. The undersigned certifies that the following statements, unless modified by attachment, are correct:

1. The proposed substitution does not alter the layout, dimensions or conditions shown on the drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detail modifications, and/or construction cost caused by requested substitution.
3. The proposed substitution will have no adverse effect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be equally available for the proposed substitution.

C. REQUIRED ATTACHMENTS - Request will not be reviewed without the following:

1. Product Data, including product description, specifications, drawings, photographs, performance and testing data, adequate for evaluation of request. Applicable portions of the data must be clearly identified.
2. Written and/or graphic description of changes to the Contract Documents that the proposed substitution will require for its proper installation.
3. Samples, where applicable.
4. Warranties, where applicable.

Submitted by:

SIGNATURE _____ DATE _____

NAME _____ POSITION _____

COMPANY NAME _____

Action Taken:

___ APPROVED ___APPROVED AS NOTED ___ REJECTED

By: _____ Date: _____

Remarks: _____

END OF SECTION 01330

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Requirements:

1. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of [**five**] previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
5. Other required items indicated in individual Specification Sections.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329 and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

a. Provide test specimens representative of proposed products and construction.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
d. When testing is complete, remove test specimens, assemblies, do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.

4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.

    a. Allow [**seven**] days for initial review and each re-review of each mockup.

5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed unless otherwise indicated.

K. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Specification Sections in Divisions 02 through 33.

1.7 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

    a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.8 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ABAA	Air Barrier Association of America
ABMA	American Bearing Manufacturers Association
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association (Now part of CPA)
AHAM	Association of Home Appliance Manufacturers
AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction

AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)
ALSC	American Lumber Standard Committee, Incorporated
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	Architectural Precast Association
APA	APA - The Engineered Wood Association
APA EWS	APA - The Engineered Wood Association; Engineered Wood Systems (See APA - The Engineered Wood Association)
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASCE	American Society of Civil Engineers
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International (American Society of Mechanical Engineers International)
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (American Society for Testing and Materials International)
AWCI	Association of the Wall and Ceiling Industry
AWCMA	American Window Covering Manufacturers Association (Now WCMA)
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association (Formerly: American Wood Preservers' Association)

AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BICSI	BICSI, Inc.
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
BISSC	Baking Industry Sanitation Standards Committee
BWF	Badminton World Federation (Formerly: IBF - International Badminton Federation)
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Canadian Electricity Association
CEA	Consumer Electronics Association
CFFA	Chemical Fabrics & Film Association, Inc.
CGA	Compressed Gas Association
CIMA	Cellulose Insulation Manufacturers Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CRRC	Cool Roof Rating Council
CPA	Composite Panel Association
CPPA	Corrugated Polyethylene Pipe Association
CRI	Carpet and Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CSA	CSA International (Formerly: IAS - International Approval Services)

CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DHI	Door and Hardware Institute
EIA	Electronic Industries Alliance
EIMA	EIFS Industry Members Association
EJCDC	Engineers Joint Contract Documents Committee
EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association (Electrostatic Discharge Association)
ETL SEMCO	Intertek ETL SEMCO (Formerly: ITS - Intertek Testing Service NA)
FIBA	Federation Internationale de Basketball (The International Basketball Federation)
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FM Approvals	FM Approvals LLC
FM Global	FM Global (Formerly: FMG - FM Global)
FMRC	Factory Mutual Research (Now FM Global)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.
FSA	Fluid Sealing Association
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Part of GSI)
GS	Green Seal

GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)
HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation (Now BWF)
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IEST	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
ILI	Indiana Limestone Institute of America, Inc.
ISO	International Organization for Standardization Available from ANSI
ISSFA	International Solid Surface Fabricators Association
ITS	Intertek Testing Service NA (Now ETL SEMCO)
ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LMA	Laminating Materials Association (Now part of CPA)
LPI	Lightning Protection Institute

MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.
MFMA	Metal Framing Manufacturers Association, Inc.
MH	Material Handling (Now MHIA)
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International (National Association of Corrosion Engineers International)
NADCA	National Air Duct Cleaners Association
NAGWS	National Association for Girls and Women in Sport
NAIMA	North American Insulation Manufacturers Association
NBGQA	National Building Granite Quarries Association, Inc.
NCAA	National Collegiate Athletic Association (The)
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute
NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	NFPA (National Fire Protection Association)

NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association)
NOMMA	National Ornamental & Miscellaneous Metals Association
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)
NWWDA	National Wood Window and Door Association (Now WDMA)
OPL	Omega Point Laboratories, Inc. (Now ITS)
PCI	Precast/Prestressed Concrete Institute
PDCA	Painting & Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PLANET	Professional Landcare Network (Formerly: ACLA - Associated Landscape Contractors of America)
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service

SAE	SAE International
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers (See ASCE)
SGCC	Safety Glazing Certification Council
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMPTE	Society of Motion Picture and Television Engineers
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)
SPIB	Southern Pine Inspection Bureau (The)
SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TCA	Tile Council of America, Inc. (Now TCNA)
TCNA	Tile Council of North America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society

TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball
USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)
WIC	Woodwork Institute of California (Now WI)
WMMPA	Wood Moulding & Millwork Producers Association
WSRCA	Western States Roofing Contractors Association
WWPA	Western Wood Products Association

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

IAPMO	International Association of Plumbing and Mechanical Officials
ICC	International Code Council
ICC-ES	ICC Evaluation Service, Inc.
UBC	Uniform Building Code (See ICC)

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE	Army Corps of Engineers
CPSC	Consumer Product Safety Commission
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FDA	Food and Drug Administration
GSA	General Services Administration
HUD	Department of Housing and Urban Development
LBL	Lawrence Berkeley National Laboratory
NCHRP	National Cooperative Highway Research Program (See TRB)
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration
PBS	Public Buildings Service (See GSA)
PHS	Office of Public Health and Science
RUS	Rural Utilities Service (See USDA)
SD	State Department
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG Americans with Disabilities Act (ADA)
Architectural Barriers Act (ABA)
Accessibility Guidelines for Buildings and Facilities
Available from U.S. Access Board

CFR Code of Federal Regulations
Available from Government Printing Office

DOD Department of Defense Military Specifications and Standards
Available from Department of Defense Single Stock Point

DSCC Defense Supply Center Columbus
(See FS)

FED-STD Federal Standard
(See FS)

FS Federal Specification
Available from Department of Defense Single Stock Point

Available from Defense Standardization Program

Available from General Services Administration

Available from National Institute of Building Sciences

FTMS Federal Test Method Standard
(See FS)

MIL (See MILSPEC)

MIL-STD (See MILSPEC)

MILSPEC Military Specification and Standards
Available from Department of Defense Single Stock Point

UFAS Uniform Federal Accessibility Standards
Available from Access Board

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CBHF State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation

CCR California Code of Regulations

CPUC California Public Utilities Commission

TFS Texas Forest Service
Forest Resource Development

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Division 01 Section "Substitution Procedures" for requests for substitutions.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. Refer to Divisions 02 through 33. Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
    a. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Submittals & Substitutions" Article for consideration of an unnamed product.

4. Manufacturers:

a. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Submittals & Substitutions" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

B. Related Requirements:

1. Division 01 Section "Summary" for limits on use of Project site.
2. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.2 INFORMATIONAL SUBMITTALS

A. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.3 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements of Division 01 sustainable design requirements Section.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to [local utility] [Owner] that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to conditions on site. If discrepancies are discovered, notify Architect promptly.

B. General: Lay out the Work using accepted practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.

3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to [minimize] [prevent] interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:

1. Division 01 Section “Execution” for information on Cutting and Patching.
2. Divisions 02 through 49 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.

7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

A. Sustainability Requirements for Building Reuse:

1. Maintain existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and nonstructural roofing material) not indicated to be removed; do not cut such existing construction beyond indicated limits.
2. Maintain existing interior nonstructural elements (interior walls, doors, floor coverings, and ceiling systems) not indicated to be removed; do not cut such existing construction beyond indicated limits.
3. Maintain existing nonshell, nonstructural components (walls, flooring, and ceilings) not indicated to be removed; do not cut such existing construction beyond indicated limits.

B. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

1. This includes steel lintels and bearing masonry elements

C. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.[Operating elements include the following:]
1. Mechanical systems piping and ducts.
2. Communication systems.
3. Electrical wiring systems.

D. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:

1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Exterior wall construction.
4. Equipment supports.
5. Piping, ductwork, vessels, and equipment.
6. Noise- and vibration-control elements and systems.

E. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

F. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to [minimize] [prevent] interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete/Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:
1. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
2. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
3. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
4. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of [**10**] days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by **Architect**. Label with manufacturer's name and model number where applicable.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.

5. Submit test/adjust/balance records.
6. Submit sustainable design submittals required in Division 01 sustainable design requirements Section and in individual Division 02 through 33 Sections.
7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of **10** days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01 Section "Demonstration and Training."
6. Advise Owner of changeover in heat and other utilities.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of **10** days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.6 FINAL COMPLETION PROCEDURES

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems

B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Submit list of incomplete items in the following format:

    a. MS Excel electronic file. Architect will return annotated copy.
    b. PDF electronic file. Architect will return annotated copy.

1.8 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
l. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
p. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Division 01 Section "Temporary Facilities and Controls." Prepare written report.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 01781 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Requirements:

1. Section 01782 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:
1. Number of Copies: Submit copies of record Drawings as follows:

a. Final Submittal:

1) Submit one paper-copy set(s) of marked-up record prints.
2) Submit record digital data files
3) Plot each drawing file, whether or not changes and additional information were recorded.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

b. Record data as soon as possible after obtaining it.
c. Record and check the markup before enclosing concealed installations.

2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file with comment function enabled.
2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
3. Refer instances of uncertainty to Architect through Construction Manager for resolution.
4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.

C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Format: Annotated PDF electronic file with comment function enabled.
2. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
3. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect and Construction Manager.
e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders, record Product Data, and record Drawings where applicable.

B. Format: Submit record Specifications as annotated PDF electronic file.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as annotated PDF electronic file.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's and Construction Manager's reference during normal working hours.

END OF SECTION 01781

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Product maintenance manuals.
5. Systems and equipment maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
b. Enable inserted reviewer comments on draft submittals.

2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect, through Construction Manager, will return copies.

C. Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least **15** days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's . Submit copies of each corrected manual within **5** days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.

B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

C. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

F. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

G. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

    a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name,[and] subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.

4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.3 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.

F. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training video recordings.

1.2 CLOSEOUT SUBMITTALS

1. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format on compact disc.

1.3 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

1.4 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

a. System, subsystem, and equipment descriptions.
b. Performance and design criteria if Contractor is delegated design responsibility.
c. Operating standards.

d. Regulatory requirements.
e. Equipment function.
f. Operating characteristics.
g. Limiting conditions.
h. Performance curves.

2. Documentation: Review the following items in detail:

a. Emergency manuals.
b. Operations manuals.
c. Maintenance manuals.
d. Project record documents.
e. Identification systems.
f. Warranties and bonds.
g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

a. Instructions on meaning of warnings, trouble indications, and error messages.
b. Instructions on stopping.
c. Shutdown instructions for each type of emergency.
d. Operating instructions for conditions outside of normal operating limits.
e. Sequences for electric or electronic systems.
f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

a. Startup procedures.
b. Equipment or system break-in procedures.
c. Routine and normal operating instructions.
d. Regulation and control procedures.
e. Control sequences.
f. Safety procedures.
g. Instructions on stopping.
h. Normal shutdown instructions.
i. Operating procedures for emergencies.
j. Operating procedures for system, subsystem, or equipment failure.
k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

5. Adjustments: Include the following:

a. Alignments.
b. Checking adjustments.
c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:

a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.
b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

3.2 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
1. Owner will furnish an instructor to describe Owner's operational philosophy.
2. Owner will furnish Contractor with names and positions of participants.

B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner and Construction Manager, with at least seven days' advance notice.

C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

END OF SECTION 017900

SECTION 087100 DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes: Finish Hardware for door openings, except as otherwise specified herein.

1. Door hardware for steel (hollow metal) doors.
2. Door hardware for aluminum doors.
3. Door hardware for wood doors.
4. Door hardware for other doors indicated.
5. Keyed cylinders as indicated.

B. Related Sections:

1. Division 6: Rough Carpentry.
2. Division 8: Aluminum Doors and Frames
3. Division 8: Hollow Metal Doors and Frames.
4. Division 8: Wood Doors.
5. Division 26 Electrical
6. Division 28: Electronic Security

C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.

1. Builders Hardware Manufacturing Association (BHMA)
2. NFPA 101 Life Safety Code
3. NFPA 80 -Fire Doors and Windows
4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
5. UL10C – Positive Pressure Fire Test of Door Assemblies
6. ANSI-A117.1 – Accessible and Usable Buildings and Facilities
7. DHI /ANSI A115.IG – Installation Guide for Doors and Hardware
8. ICC – International Building Code

D. Intent of Hardware Groups

1. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
2. Where items of hardware aren't definitely or correctly specified, are required for completion of the Work, a written statement of such omission, error, or other discrepancy to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.

E. Allowances

1. Refer to Division 1 for allowance amount and procedures.

F. Alternates

1. Refer to Division 1 for Alternates and procedures.

1.2 SUBSTITUTIONS:

A. Comply with Division 1.

1.3 SUBMITTALS:

A. Comply with Division 1.

B. Special Submittal Requirements: Combine submittals of this Section with Sections listed below to ensure the "design intent" of the system/assembly is understood and can be reviewed together.

C. Product Data: Manufacturer's specifications and technical data including the following:

1. Detailed specification of construction and fabrication.
2. Manufacturer's installation instructions.
3. Wiring diagrams for each electric product specified. Coordinate voltage with electrical before submitting.
4. Submit 6 copies of catalog cuts with hardware schedule.
5. Provide 9001-Quality Management and 14001-Environmental Management for products listed in Materials Section 2.2

D. Shop Drawings - Hardware Schedule: Submit 6 complete reproducible copy of detailed hardware schedule in a vertical format.

1. List groups and suffixes in proper sequence.
2. Completely describe door and list architectural door number.
3. Manufacturer, product name, and catalog number.
4. Function, type, and style.
5. Size and finish of each item.
6. Mounting heights.
7. Explanation of abbreviations and symbols used within schedule.
8. Detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment and access control equipment, and door and frame rough-ins required for specific opening.

E. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.

1. Templates, wiring diagrams and "reviewed Hardware Schedule" of electrical terms to electrical for coordination and verification of voltages and locations.

F. Samples: (If requested by the Architect)

1. 1 sample of Lever and Rose/Escutcheon design, (pair).
2. 3 samples of metal finishes

G. Contract Closeout Submittals: Comply with Division 1 including specific requirements indicated.

1. Operating and maintenance manuals: Submit 3 sets containing the following.

a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
b. Catalog pages for each product.
c. Name, address, and phone number of local representative for each manufacturer.
d. Parts list for each product.

2. Copy of final hardware schedule, edited to reflect, "As installed".
3. Copy of final keying schedule
4. As installed “Wiring Diagrams” for each piece of hardware connected to power, both low voltage and 110 volts.
5. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.4 QUALITY ASSURANCE

A. Comply with Division 1.

1. Statement of qualification for distributor and installers.
2. Statement of compliance with regulatory requirements and single source responsibility.
3. Distributor's Qualifications: Firm with 3 years experience in the distribution of commercial hardware.

a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
b. Hardware Schedule shall be prepared and signed by an AHC.

4. Installer's Qualifications: Firm with 3 years experienced in installation of similar hardware to that required for this Project, including specific requirements indicated.
5. Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.

a. Provide UL listed hardware for labeled and 20 minute openings in conformance with requirements for class of opening scheduled.
b. Underwriters Laboratories requirements have precedence over this specification where conflict exists.

6. Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.

B. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Architect in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Architect.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping: Comply with Division 1.

1. Deliver products in original unopened packaging with legible manufacturer's identification.
2. Package hardware to prevent damage during transit and storage.
3. Mark hardware to correspond with "reviewed hardware schedule".
4. Deliver hardware to door and frame manufacturer upon request.

B. Storage and Protection: Comply with manufacturer's recommendations.

1.6 PROJECT CONDITIONS:

A. Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.

B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.7 WARRANTY:

A. Refer to Conditions of the Contract

B. Manufacturer’s Warranty:

1. Closers: Ten years
2. Exit Devices: Five Years
3. Locksets & Cylinders: Three years

4. All other Hardware: Two years.

1.8 OWNER'S INSTRUCTION:

A. Instruct Owner's personnel in operation and maintenance of hardware units.

1.9 MAINTENANCE:

A. Extra Service Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals Section.

1. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.
2. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
3. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra service materials.

B. Maintenance Service: Submit for Owner's consideration maintenance service agreement for electronic products installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents. Approval of manufacturers other than those listed shall be in accordance with Division 1.

Item:	Manufacturer:	Approved:
Hinges	Stanley	Bommer, McKinney
Continuous Hinges	Stanley	Select, ABH
Locksets	Best 9K	Schlage ND, Sargent 11 Line
Cylinders	Best CoreMax	No Substittion
Exit Devices	Precision 2000	Von Duprin 98XP, Sargent 8000-ZGL-19-43
Closers	Dorma 8900/TS93	Sargent 281/440, LCN 4040XP
Access Control System	By Owner	
Push/Pull Plates	Trimco	Burns, Hiawatha
Push/Pull Bars	Trimco	Burns, Hiawatha
Protection Plates	Trimco	Burns, Hiawatha
Overhead Stops	Dorma	ABH, Trimco
Door Stops	Trimco	Burns, DCI
Flush Bolts	Trimco	ABH, Burns, DCI
Coordinator & Brackets	Trimco	ABH, Burns, DCI
Threshold & Gasketing	National Guard	Reese, K.N. Crowder

2.2 MATERIALS:

A. Hinges:

1. Template screw hole locations
2. Minimum of 2 permanently lubricated non-detachable bearings
3. Equip with easily seated, non-rising pins
4. Sufficient size to allow 180-degree swing of door
5. Furnish hinges with five knuckles and concealed bearings
6. Provide hinge type as listed in schedule.

7. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
8. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
9. UL10C listed for Fire rated doors.

B. Geared Continuous Hinges:

1. Tested and approved by BHMA for ANSI A156.26-1996 Grade 1
2. Anti-spinning through fastener
3. UL10C listed for 3 hour Fire rating
4. Non-handed
5. Lifetime warranty
6. Provide Fire Pins for 3-hour fire ratings
7. Sufficient size to permit door to swing 180 degrees

C. Cylindrical Type Locks and Latchsets:

1. Provide locksets tested and approved by BHMA/ANSI A156.2, Series 4000, Operational Grade 1, Extra-Heavy Duty.
2. Provide locksets listed by Underwriters Laboratories for use on fire rated single or double swinging doors.
3. Provide locksets that meet the design and operation of the cylindrical lock to meet the accessible requirements of ANSI A117.1 and ADA–Americans with Disabilities Act.
4. Locksets to have the capability of supporting manufacturers' conventional core as well as large and small interchangeable cores.
5. Provide core face with the same finish as the lockset.
6. Provide functions and design as indicated in the hardware groups.
7. Acceptable manufacturers and/or products:
   a. dormakaba USA Inc. - Best 9K Series
   b. ASSA ABLOY Group - Sargent 11 Line
   c. Allegion – Schlage ND Series

D. Cylindrical Deadbolt:
1. Tested and approved by ANSI A156.36, Operational Grade 1,
2. Fit modified ANSI A115.3 door preparation
3. Provide 9001-Quality Management and 14001-Environmental Management.
4. Locksets and cores to be of the same manufacturer to maintain complete lockset warranty
5. 2-3/4 inch (70mm) backset, or 2 3/8 inch backset as needed
6. 1 inch throw deadbolt
7. Provide locksets with 7-pin core.

E. Mortise Deadbolt:
1. Tested and approved by ANSI A156.36, Operational Grade 1.
2. Provide 9001-Quality Management and 14001-Environmental Management.
3. Locksets and cores to be of the same manufacturer to maintain complete lockset warranty
4. 2-3/4 inch (70mm) backset
5. 1 inch throw deadbolt
6. Provide locksets with 7-pin core.

F. Exit Devices:

1. Exit devices to meet or exceed BHMA for ANSI 156.3, Grade 1.
2. Exit devices to be tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
3. Exit devices chassis to be investment cast steel, zinc dichromate.
4. Exit devices to have stainless steel deadlocking ¾" through latch bolt.

5. Exit devices to be equipped with sound dampening on touchbar.
6. Non-fire rated exit devices to have cylinder dogging.
7. Non-fire rated exit devices to have ¼" minimum turn hex key dogging.
8. Touchpad to be "T" style constructed of architectural metal with matching metal end caps.
9. Touchbar assembly on wide style exit devices to have a ¼" clearance to allow for vision frames.
10. All exposed exit device components to be of architectural metals and "true" architectural finishes.
11. Provide strikes as required by application.
12. Fire exit hardware to conform to UL10C and UBC 7-2. UL tested for Accident Hazard.
13. The strike is to be black powder coated finish.
14. Exit devices to have field reversible handing.
15. Provide heavy duty vandal resistant lever trim with heavy duty investment cast stainless steel components and extra strength shock absorbing overload springs. Lever shall not require resetting. Lever design to match locksets and latchsets.
16. Provide 9001-Quality Management and 14001-Environmental Management.
17. Vertical Latch Assemblies to have gravity operation, no springs.

G. Cylinders:

1. Provide the necessary cylinder housings, collars, rings & springs as recommended by the manufacturer for proper installation.
2. Provide the proper cylinder cams or tail piece as required to operate all locksets and other keyed hardware items listed in the hardware sets.
3. Coordinate and provide as required for related sections.

H. Door Closers shall:

1. Tested and approved by BHMA for ANSI 156.4, Grade 1
2. UL10C certified
3. Provide 9001-Quality Management and 14001-Environmental Management.
4. Closer shall have extra-duty arms and knuckles
5. Conform to ANSI 117.1
6. Maximum 2 7/16 inch case projection with non-ferrous cover
7. Separate adjusting valves for closing and latching speed, and backcheck
8. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
9. Full rack and pinion type closer with 1½" minimum bore, where specified roller and cam.
10. Mount closers on non-public side of door, unless otherwise noted in specification
11. Closers shall be non-handed, non-sized and multi-sized.

I. Door Stops: Provide a floor or wall stop for every opening as listed in the hardware sets.

1. Wall stop and floor stop shall be wrought bronze, brass or stainless steel.
2. Provide fastener suitable for wall construction.
3. Coordinate reinforcement of walls where wall stop is specified.
4. Provide stops where wall stops are not practical.

J. Over Head Stops: Provide a Surface mounted or concealed overhead when a floor or wall stop cannot be used or when listed in the hardware set.

1. Concealed overhead stops shall be heavy duty bronze or stainless steel.
2. Surface overhead stops shall be heavy duty bronze or stainless steel.

K. Push Plates: Provide with four beveled edges ANSI J301, .050 thickness, size as indicated in hardware set. Furnish oval-head countersunk screws to match finish.

L. Pulls with plates: Provide with four beveled edges ANSI J301, .050 thickness Plate s with ANSI J401 Pull as listed in hardware set. Provide proper fasteners for door construction.

M. Push Pull Bars: Provide ANSI J504, .1" Dia. Pull and push bar model and series as listed in hardware set. Provide proper fasteners for door construction.

N. Kickplates: Provide with four beveled edges ANSI J102, 10 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.

O. Mop plates: Provide with four beveled edges ANSI J103, 6 inches high by width less 1 inch on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.

P. Door Bolts: Flush bolts for wood or metal doors.

1. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 25 for hollow metal label doors.
2. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 27 at wood label doors.
3. Manual flush bolts, Certified ANSI/BHMA 156.16 at openings where allowed local authority.
4. Provide Dust Proof Strike, Certified ANSI/BHMA 156.16 at doors with flush bolts without thresholds.

Q. Coordinator and Brackets: Provide a surface mounted coordinator when automatic bolts are used in the hardware set.

1. Coordinator, Certified ANSI/BHMA A1156.3 Type 21A for full width of the opening.
2. Provide mounting brackets for soffit applied hardware.
3. Provide hardware preparation (cutouts) for latches as necessary.

R. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.

S. Weatherstripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.

1. Weatherstrip shall be resilient seal of silicone.
2. UL10C Positive Pressure rated seal set when required.

T. Door Bottoms/Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.

1. Door seal shall be resilient seal of nylon brush.
2. UL10C Positive Pressure rated seal set when required.

U. Thresholds: Thresholds shall be cast aluminum beveled type with maximum height of ½" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.

V. Provide one wall mounted Telkee, Lund or MMF series key cabinet complete with hooks, index and tags to accommodate 50% expansion. Coordinate mounting location with architect.

W. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.

2.3 FINISH:

A. Designations used in Schedule of Finish Hardware - 3.05, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products

B. Powder coat door closers to match other hardware, unless otherwise noted.

C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.4 KEYS AND KEYING:

A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the Owner.

B. Cylinders, removable and interchangeable core system: Best CORMAX™ Patented 7-pin.

C. Permanent keys and cores: Stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."

D. Transmit Grand Masterkeys, Masterkeys and other Security keys to Owner by Registered Mail, return receipt requested.

E. Furnish keys in the following quantities:

1. 1 each Grand Masterkeys
2. 4 each Masterkeys
3. 2 each Change keys each keyed core
4. 15 each Construction masterkeys
5. 1 each Control keys

F. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Hardware Supplier. Construction cores and keys remain the property of the Hardware Supplier.

G. Keying Schedule: Arrange for a keying meeting, and programming meeting with Architect Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements. Furnish 3 typed copies of keying and programming schedule to Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.

1. Do not proceed until unsatisfactory conditions have been corrected.

3.2 HARDWARE LOCATIONS:

A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required to comply with the governing regulations.

1. Recommended Locations for Builder’s Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).

2. Recommended locations for Architectural Hardware for flush wood doors (DHI).

3. WDMA Industry Standard I.S.-1A-04, Industry Standard for Architectural wood flush doors.

3.3 INSTALLATION:

A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

B. Conform to local governing agency security ordinance.

C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.

1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.

D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use “Riv-Nuts” or similar products.

3.4 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.

1. Check and adjust closers to ensure proper operation.

2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.

a. Verify levers are free from binding.
b. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.

3. Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

3.5 SCHEDULE OF FINISH HARDWARE:

Manufacturer List

Code	Name
BE	Best Access Systems
BEA	BEA Inc
BY	By Others
DM	Dorma Door Controls
NA	National Guard
PR	Precision
ST	Stanley
TR	Trimco

Option List

Code	Description
4	1-3/4" Door Thickness
C	QUICK CONNECT WIRING OPTION
N	Thru-Bolt w/ Flow-Thru
CD	CYLINDER DOGGING
DA	ADJUSTABLE DELAYED ACTION
FL	Fire Exit Hardware
RP	RINGS-RIM CYLINDER
TS	TOUCHBAR MONITORING SWITCH
36"	36" Door Width
CSK	COUNTER SINKING OF KICK and MOP PLATES
MCS	Mullion Cap Spacer (other Finishes)
MLR	MOTORIZED LATCH RETRACTION
RP3	RINGS-7 PIN MORTISE
S3B	ANSI Strike Package w/Plastic Box
DP89	Drop Plate for PA for Top Rail <5 3/4"
FCSL	Full Plastic Slotted Cover

CA-03	Cylinder Attachment Kit (Rim/SVR Device)
1-3/4"	1-3/4" Thick Doors
NCA-03	Cylinder Attachment Kit(24/2500 Devices)
MIDPOST	Midpost (AP400 Series)
S3B-7/8	ANSI Strike -7/8" Flat Lip w/Plastic Box
EPT Prep	EPT Prep (full mortise)
B4E-HEAVY-KP	BEVELED 4 EDGES - KICK PLATES
1/4-20-2" COMBO	1/4-20 X COMBO MS/ANCHOR (SS)

Finish List

Code	Description
AL	Aluminum
626, US26D	Satin Chromium Plated
630	Satin Stainless Steel
689	Aluminum Painted
GREY	Grey

Hardware Sets

SET #1

Doors: 1-114, 1-115

3	Hinges	CB168 4 1/2 X 4 1/2	US26D	ST
1	Hospital Pull	1135	630	TR
1	Closer	TS9315 T	689	DM
1	Push Plate	1001-11	630	TR
1	Push Plate	1001-3 (Mate With 1135 Pull)	630	TR
1	Kick Plate	KO050 10" x 2" LDW x B4E x CSK	630	TR
1	Mop Plate	KM050 6" x 1" LDW x B4E x CSK	630	TR
1	Wall Bumper	1270CX	626	TR
3	Door Silencers	1229A	GREY	TR

SET #2

Doors: 1-110,1-111, 1-112,1-113

3	Hinges	CB179 4 1/2 X 4 1/2	US26D	ST
1	Lockset	9K3-7D14K PATD S3B (Provide Anti-Barricade Overide)		626 BE
1	Closer	8916 AF89 DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" LDW x B4E x CSK	630	TR
1	Wall Bumper	1270CX	626	TR
3	Door Silencers	1229A	GREY	TR

Opening List

Opening	Hdw Set	Opening Label
1-109	1	
1-110	1	
1-111	6	
1-112	3	
1-113	3	

SECTION 081416 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data and Shop Drawings.

PART 2 - PRODUCTS

2.1 HOLLOW METAL DOORS AND FRAMES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
Amweld International, LLC.
Ceco Door; ASSA ABLOY.
Curries Company; ASSA ABLOY.
Fleming Door Products Ltd.; Assa Abloy Group Company.
Steelcraft; an Allegion brand.

B. Fire-Rated Doors and Frames: Labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, based on testing at positive pressure according to NFPA 252 or UL 10C.

C. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784 and installed in compliance with NFPA 105.

D. Doors: Complying with SDI A250.8 for level and model and SDI A250.4 for physical-endurance level indicated, 1-3/4 inches thick unless otherwise indicated.

1. Interior Doors: Level 2 and Physical Performance Level B (Heavy Duty), Model 1 Full Flush, Model 2 Seamless.

2. Exterior Doors: Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 2 (Seamless), metallic-coated steel sheet faces.

a. Thermal-Rated (Insulated) Doors: Provide doors with thermal-resistance value (R-value) of not less than R15 when tested according to ASTM C 1363.

3. Hardware Reinforcement: Fabricate according to SDI A250.6 with reinforcement plates from same material as door face sheets.

E. Frames: ANSI A250.8; conceal fastenings unless otherwise indicated.

1. Steel Sheet for Interior Frames: 0.053-inch minimum thickness.
2. Steel Sheet for Exterior Frames: 0.067-inch minimum thickness, metallic coated.
3. Interior Frame Construction: Full profile welded.
4. Exterior Frame Construction: Full profile welded.
5. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.
6. Frame Anchors: Not less than 0.042 inch thick.

F. Historic replication of Glazing Stops: Nonremovable, aluminum glazing stops on inside, fabricated to match existing exterior doors.

G. Door Silencers: Three on strike jambs of single-door frames and two on heads of double-door frames.

H. Grout Guards: Provide where mortar might obstruct hardware operation.

I. Prepare doors and frames to receive mortised and concealed hardware according to SDI A250.6 and BHMA A156.115.

J. Reinforce doors and frames to receive surface-applied hardware.

K. Prime Finish: Manufacturer's standard, factory-applied coat of lead- and chromate-free primer complying with SDI A250.10 acceptance criteria.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, free of scale, pitting, or surface defects.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, G60 or A60.

D. Frame Anchors: ASTM A 879/A 879M, 4Z coating designation; mill phosphatized.

1. For anchors built into exterior walls, sheet steel complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install hollow metal frames to comply with SDI A250.11.

1. Fire-Rated Frames: Install according to NFPA 80.

B. Install doors to provide clearances between doors and frames as indicated in SDI A250.11.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying rust-inhibitive primer.Use galvanizing repair paint for metallic coated surfaces.

END OF SECTION 08 1113

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assemblies per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

B. STC-Rated Assemblies: Provide materials and construction identical to those tested in assemblies per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing and inspecting agency.

2.2 METAL FRAMING AND SUPPORTS

A. Steel Framing Members, General: ASTM C 754.

1. Steel Sheet Components: ASTM C 645. Thickness specified is minimum uncoated base-metal thickness.
2. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized zinc coating.

B. Framing Systems:

1. Studs and Runners: In depth indicated and 0.033 inch thick unless otherwise indicated.
2. Flat Strap and Backing: 0.033 inch thick.
3. Hat-Shaped, Rigid Furring Channels: In depth indicated and 0.033 inch thick.
4. Resilient Furring Channels: 1/2 inch deep, with single- or double-leg configuration.
5. Cold-Rolled Furring Channels: 0.053 inch thick, 3/4 inch deep.
6. Z-Furring: In depth required by insulation, 1-1/4-inch face flange, 7/8-inch wall-attachment flange, and 0.018 inch thick.

C. Suspension Systems:

1. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch diameter, or double strand of 0.048-inch- diameter wire.
2. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, and 0.162-inch diameter.
3. Carrying Channels: Cold-rolled steel, 0.053 inch thick, 2-1/2 inches unless otherwise noted or required for installation.
4. Furring Channels: 3/4-inch- deep, cold-rolled channels, 0.053 inch thick Steel studs, 0.018 inch thick, in depth indicated , Steel, rigid hat-shaped channels; 7/8 inch deep,

0.018 inch thick, Resilient furring channels, 1/2 inch deep, with single- or double-leg configuration.

5. Grid Suspension System for Gypsum Board Ceilings: Interlocking, direct-hung system.

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

        1) Armstrong World Industries, Inc.
        2) Chicago Metallic Corporation.
        3) United States Gypsum Company.

2.3 ACCESSORIES

A. General: Comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Asphalt felt or foam gasket.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install steel framing to comply with ASTM C 754."

1. Gypsum Plaster Assemblies: Also comply with ASTM C 841.
2. Portland Cement Plaster Assemblies: Also comply with ASTM C 1063.
3. Gypsum Veneer Plaster Assemblies: Also comply with ASTM C 844.
4. Gypsum Board Assemblies: Also comply with ASTM C 840.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Isolate steel framing from building structure, except at floor, to prevent transfer of loading imposed by structural movement.

1. Where studs are installed directly against exterior walls, install isolation strip between studs and wall.

D. Fire-Resistance-Rated Assemblies: Comply with requirements of listed assemblies.

E. Install suspension systems level to within 1/8 inch in 12 feet.

END OF SECTION 09 2216

SECTION 092613 - GYPSUM VENEER PLASTERING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assemblies per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

B. STC-Rated Assemblies: Provide materials and construction identical to those tested in assemblies per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing and inspecting agency.

2.2 GYPSUM VENEER PLASTER

A. Gypsum Veneer Plaster: ASTM C 587, [one] [two]-component veneer plaster system

1. One-Component Gypsum Veneer Plaster:

2.3 PANEL PRODUCTS

A. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

B. Gypsum Base for Veneer Plaster: ASTM C 1396/C 1396M, in thicknesses indicated. [Regular type unless otherwise indicated] [Foil backed where indicated] [Type X where indicated] [Type as required for specific fire-resistance-rated assemblies].

C. Backing Panels for Multilayer Application: ASTM C 1396/C 1396M, in thicknesses indicated. Same type as face layer unless otherwise indicated

D. Cementitious Backer Units: ANSI A118.9 or ASTM C 1288, in thicknesses indicated.

2.4 ACCESSORIES

A. Trim Accessories: ASTM C 1047

1. Provide cornerbead at outside corners unless otherwise indicated.
2. Provide LC-bead (J-bead) at exposed panel edges.
3. Provide control joints where indicated.

B. Joint-Reinforcing Materials: ASTM C 587.

1. Joint Tape: As recommended by gypsum veneer plaster manufacturer for applications indicated.
2. Embedding Material: As recommended by gypsum veneer plaster manufacturer.

C. Cementitious Backer Unit Joint-Treatment Materials: As recommended by cementitious backer unit manufacturer.

D. Bonding Agent: ASTM C 631, polyvinyl acetate.

E. Sound-Attenuation Blankets: ASTM C 665, Type I (unfaced).

F. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant complying with ASTM C 834.

1. Sealants shall have a VOC content of 250 g/L or less.
2. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panel products to comply with ASTM C 844 and as follows:

1. Isolate veneer plaster assemblies from abutting structural and masonry work. Provide edge trim and acoustical sealant.
2. Single-Layer Fastening Methods: Fasten gypsum panels to supports with screws.

B. STC-Rated Assemblies: Comply with ASTM C 919 for locating edge trim and closing off sound-flanking paths around or through assemblies.

C. Fire-Resistance-Rated Assemblies: Comply with requirements of listed assemblies.

D. Cementitious Backer Units: Comply with ANSI A108.11.

E. Apply bonding agent to dry [concrete] [masonry] [and] [cementitious backer units].

F. Apply gypsum veneer plaster to comply with ASTM C 843 and manufacturer's written recommendations.

1. One-Component Gypsum Veneer Plaster: Trowel apply base coat over substrate to uniform thickness of 1/16 to 3/32 inch. Fill all voids and imperfections.
2. Provide **smooth-troweled** finish.

END OF SECTION 092613

SECTION 09250 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Exterior gypsum board for ceilings and soffits.
3. Tile backing panels.
4. Special trim, edge and reveal systems

B. See Section 098513 Monolithic Gypsum Panels

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Product Data for Credit IEQ 4.1: For adhesives used to laminate gypsum board panels to substrates, documentation including printed statement of VOC content.
2. Laboratory Test Reports for Credit IEQ 4: For adhesives used to laminate gypsum board panels to substrates, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Low Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 GYPSUM BOARD, GENERAL

A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 98 percent (USG Moundsville WV, USA).

B. Regional Materials: Gypsum panel products shall be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

C. Regional Materials: Gypsum panel products shall be manufactured within 500 miles (800 km) of Project site.

2.3 INTERIOR GYPSUM BOARD

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. USG Corporation.

B. Gypsum Board, Type X: ASTM C 1396/C 1396M.

   1. Thickness: 5/8 inch (15.9 mm).
   2. Long Edges: Tapered

C. Flexible Gypsum Board: ASTM C 1396/C 1396M. Manufactured to bend to fit radii and to be more flexible than standard regular-type gypsum board of same thickness.

   1. Thickness: 1/4 inch (6.4 mm).
   2. Long Edges: Tapered.

D. Gypsum Ceiling Board: ASTM C 1396/C 1396M.

   1. Thickness: 1/2 inch (12.7 mm).
   2. Long Edges: Tapered.

E. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.

   1. Core: 5/8 inch (15.9 mm), Type X.
   2. Long Edges: Tapered.
   3. Mold Resistance: ASTM D 3273, score of 10.

2.4 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS

A. Exterior Gypsum Soffit Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.

   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. USG Corporation.

2. Core: 5/8 inch (15.9 mm), Type X.

B. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Georgia-Pacific Gypsum LLC; Dens-Glass Gold.
   b. National Gypsum Company; Gold Bond, e(2)XP.
   c. USG Corporation; Securock Glass Mat Sheathing.

2. Core: 5/8 inch (15.9 mm), Type X.

2.5 TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. CertainTeed Corp.; GlasRoc Tile Backer.
   b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.

2. Core regular type 5/8 inch (15.9 mm), Type X.
3. Mold Resistance: ASTM D 3273, score of 10.

B. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

2.
   a. CertainTeed Corp.
   b. Georgia-Pacific Gypsum LLC.
   c. USG Corporation.

3. Core: 5/8 inch (15.9 mm), Type X, Type C as required by fire-resistance-rated assembly indicated on Drawings.

2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet

B. Exterior Trim: ASTM C 1047.

1. Material: Hot-dip galvanized steel sheet.

C. Aluminum Trim: ASTM B 221 (ASTM B 221M), Alloy 6063-T5.

D. Fry Reglet Drywall reveal Moldings as indicated n drawings.

E. Monarch Easy Panel Integrated Reveal/Z Clip.

2.7 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Exterior Gypsum Soffit Board: Paper.
3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
4. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

2.8 AUXILIARY MATERIALS

A. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Laminating adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing).

1. Recycled Content of Blankets: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 50% percent.

D. Acoustical Joint Sealant: ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings as demonstrated by testing according to ASTM E 90.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
b. Grabber Construction Products; Acoustical Sealant GSC.
c. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
d. USG Corporation; SHEETROCK Acoustical Sealant.

2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Acoustical joint sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Thermal Insulation: As specified in Division 7 Section "Building Insulation."

F. Vapor Retarder: As specified in Division 7 Section "Building Insulation."

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

A. Comply with ASTM C 840.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

D. Install trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

1. Aluminum Trim: Install in locations indicated on Drawings
2. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect].

E. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

F. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840 unless otherwise noted on drawings and finish schedule:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile
3. Level 3: All core and shell spaces unless otherwise indicated.

4. Level 4: All tenant spaces unless otherwise indicated.

    a. Primer and its application to surfaces are specified in other Division 9 Sections.

5. Level 5: All Lobbies and where indicated on Drawings

    a. Primer and its application to surfaces are specified in other Division 9 Sections.

G. Protect adjacent surfaces from drywall compound and texture finishes and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

H. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 09250

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product data and Samples.

B. Obtain tile of each type and color or finish from same production run for each contiguous area.

C. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling ceramic tile packages.

PART 2 - PRODUCTS

2.1 CERAMIC TILE

A. Ceramic tile that complies with ANSI A137.1.

B. Ceramic Tile Type FT-1: unglazed porcelain floor tile.

1. Basis-of-Design Product: Subject to compliance with requirements, provide or a comparable product by one of the following:

a. ACP REGAL 12 X24 Nero Matte.

C. Ceramic Tile Type CT-1/B-3: Glazed wall tile and base.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or a comparable product by one of the following:

a. Crossville 4” x 8” “Color by Numbers”

2. Grout Color: From Manufacturers Full range of colors
3. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:

a. Base for Portland Cement Mortar Installations: Coved.
b. Base for Thinset Mortar Installations: Straight.
c. Wainscot Cap for Portland Cement Mortar Installations: Bullnose cap.
d. Wainscot Cap for Thinset Mortar Installations: Surface bullnose.
e. External Corners for Portland Cement Mortar Installations: Bullnose shape with radius of at least 3/4 inch unless otherwise indicated.
f. External Corners for Thinset Mortar Installations: Surface bullnose.
g. Internal Corners: Field-butted square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.

2.2 INSTALLATION MATERIALS

A. Cementitious Backer Units: ANSI A118.9 or ASTM C 1325, 1/2 inch thick.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Georgia-Pacific Building Products.
b. United States Gypsum Company.

B. Fiber-Cement Underlayment: ASTM C 1288, 1/2 inch thick.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. CertainTeed Corporation.
b. James Hardie Building Products, Inc.

C. Low-Emitting Materials: Section 01 8113.14 - Sustainable Design Requirements - LEED v4 BD+C

D. Waterproofing Membranes for Thinset Installations: ANSI A118.10, [fabric-faced chlorinated polyethylene, PVC, or polyethylene sheet product] [fabric-reinforced modified bituminous product] [fabric-reinforced liquid-latex or elastomeric polymer product] [unreinforced liquid-latex or elastomeric polymer product] [urethane waterproofing and adhesive].

E. Setting and Grouting Materials: Comply with material standards in ANSI's "Specifications for the Installation of Ceramic Tile" that apply to materials and methods indicated.
1. Thinset Mortar Type: Improved modified dry-set, ANSI A118.15 mortar; white, unless otherwise indicated.

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1) LATICRETE SUPERCAP, LLC.
2) MAPEI Corporation.
3) Summitville Tiles, Inc.

2. Grout Type: High-performance tile grout, ANSI A118.7, unless otherwise indicated.

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1) ARDEX Americas.
2) H.B. Fuller Construction Products Inc. / TEC.
3) LATICRETE SUPERCAP, LLC.
4) MAPEI Corporation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, are specified in tile installation schedules, and apply to types of setting and grouting materials used.

B. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight, aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

C. Lay tile in grid pattern unless otherwise indicated. Align joints where adjoining tiles on floor, base, walls, and trim are the same size.

D. Install cementitious backer units and fiber-cement underlayment, and treat joints according to ANSI A108.11.

E. Install waterproofing to comply with ANSI A108.13.

F. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

G. Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in modified dry-set mortar (thinset).

H. Interior Floor Tile Installation Method(s):

1. Type 1: Over Concrete Subfloors: TCNA F114; cement mortar bed with cleavage membrane, epoxy grout TCNA F115; thinset mortar, epoxy grout TCNA F116; water-cleanable, tile-setting epoxyTCNA F131; water-cleanable, tile-setting epoxy; epoxy grout).

I. Interior Wall Tile Installation Method(s):
1. TCNA W244C or TCNA W244F; thinset mortar on cementitious backer units or fiber-cement underlayment over vapor retarder membrane]

END OF SECTION 09 3013

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data and Samples.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Standard: Acoustical panel ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assemblies per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

2.2 ACOUSTICAL PANELS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Panels and Grid as indicated below and on drawings or a comparable product based on the following:

1. Armstrong World Industries, Inc.

B. BASIS OF DESIGN

1. ACT – 2 DUNE 2x2

a. Tegular Edge
b. Grid: Interlude Excel 9/16” White

2.3 CEILING SUSPENSION SYSTEM

A. Ceiling Suspension System: Narrow-face, direct-hung system; ASTM C 635, heavy-duty structural classification.

B. Attachment Devices: Sized for 5 times the design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated

C. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

1. Size: Provide yield strength at least 3 times the hanger design load (ASTM C 635, Table 1, Direct Hung), but not less than diameter wire.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install acoustical ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.

B. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

C. Arrange directionally patterned acoustical units as indicated on Drawings.

END OF SECTION 095113

SECTION 095813 MONOLITHIC ACOUSTICAL CEILING AND WALL SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Suspension systems for perforated gypsum interior ceilings and soffits.
   2. Acoustical Insulation for perforated gypsum board ceilings.
   3. Extruded aluminum trim for ceiling height changes and material transitions.

B. Related Requirements:

   1. Section 054000 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; floor joists; roof rafters and ceiling joists; and roof trusses.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Subcontractor is an experienced Installer, approved and trained by product manufacturer to properly install ceiling system.
   1. Subcontractor shall provide documentation that they are certified installers of the USG Ensemble™ Ceiling System.
   2. Subcontractor shall utilize approved equipment and procedures for proper installation.

B. Source Limitations: The Ensemble Ceiling is to be purchased and installed by a certified single-source provider.

1.5 COORDINATION:

A. Pre-installation conference: Conduct conference at project site coordinate all luminaires, sprinklers, exit signs and MEP devices that are to be installed in the ceiling.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened packaging and store in an enclosed shelter providing protection from damage and exposure to the elements.

1. Store within temperature limits required by manufacturer.
2. Store panels flat.
3. Comply with manufacturer's requirements for safety and handling.

B. Discard joint compounds and sealants that cannot be applied within their stated shelf life.

C. Store accessory materials in a location with constant ambient temperatures of 50 to 80 °F (15 to 27 °C). Avoid exposure to sustained temperatures exceeding 125 °F (52 °C).

1.7 FIELD CONDITIONS

A. Install Ensemble system in an indoor environment that is climate controlled.

B. Comply with ASTM C840 requirements for interior drywall installation: Maintain room temperatures at greater than 40 °F (4.4 °C) at least 48 hours before panel installation and greater than 50 °F (10 °C) at least 48 hours before joint treatment or spray-applied finish application, and continuously during and after application.

C. Avoid exposure and protect from excessive, repetitive or continuous moisture before, during and after installation. Eliminate sources of moisture immediately.

D. Adequate ventilation shall be maintained in the working area during installation and curing period.

1.8 WARRANTY

A. Product is furnished as is to the contractor.

B. Reference Division 01 for General Contractor Obligations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 MONOLITHIC SOUND ABSORBING GYPSUM BOARD SYSTEM

A. Sound Absorbing Gypsum Ceiling and Framing System:
1. Basis of Design: Subject to compliance with project requirements, the design is based on the following: USG Interiors, LLC, "USG ENSEMBLE™ ACOUSTICAL DRYWALL CEILING".

2.3 STEEL FRAMING FOR SUSPENDED PANELS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
1. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.

B. Perforated Gypsum Board suspension system: complies with applicable requirements per ASTM C 645, direct-hung system composed of Index support bars and cross-furring drywall suspension tees that interlock.
   1. Framing System:
      a. Deflection criteria: L/240 per ASTM C635.
      b. Galvanized Steel: G40 double-web tee, hot-dipped galvanized steel.
   2. HORIZONTAL Framing Members:
      a. USG Drywall Suspension system main tees: DGLW26.
      b. USG Drywall Suspension system 4’ cross tees: DGLW-424
   3. CURVED Framing Members
      a. USG Drywall Suspension system curved main tees: Item No. Varies
      b. USG Drywall Suspension system 4’ cross tees: DGLW-424
      c. Curve Radius: **As per Drawings**
   4. Attachment devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements, if applicable.
   5. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
      a. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
      b. Size: Minimum 12 gage per ASTM C636.

2.4 STEEL FRAMING FOR VERTICAL DIRECT APPLIED PANELS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
   1. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.

B. Direct Applied system: Z-Channel with slotted or unslotted web.
   1. Channel Depth: 1 (25mm).
   2. Minimum Base-Metal Thickness: [As indicated on Drawings] [As required by performance requirements for horizontal deflection criteria: L/240 per ASTM C635] [0.0179 inch (0.455 mm)].

C. Impaling Clip: Galvanized impaling clip to retain acoustical insulation until Engineered Gypsum Board is attached.
   1. Size: 2 ½” x 1 ½” (62 x 38) by ATS Acoustics or equal.

2.5 ENGINEERED GYPSUM-BASED PANEL PRODUCT APPLICATION

A. Engineered Acoustical Gypsum-Based Panel product for CEILING AND WALL application.
   1. Perforated non-fire rated gypsum panel with acoustically transparent scrim: complies with ASTM C1396 Non-Type X.
   2. Subject to compliance with project requirements, the base panel is made from the following: USG Corporation, LLC**,** “USG Sheetrock® Brand EcoSmart FC 30 Ensemble™ Panels 5/8".
   3. UL Type Designation “FC30” (prior to modifications)
   4. ASTM C 1396/C 1396M: 5/8” wallboard, non-type X (prior to modifications).
   5. ASTM E136 Non-combustibility: Meets or exceeds criteria.
   6. ASTM C473:
      a. Core Hardness: Meets or Exceeds 11 (ASTM C473 B)

b. Flexural Strength (lbf).
    a. Parallel: Not less than 46.
    b. Perpendicular: Not less than 147.
c. Nail Pull Resistance (lbf) ASTM C473 (B): Not less than 87.

7. Thickness: 5/8 inch (12.7 mm).
8. Length: 9'-4" (2845 mm),
9. Widths: 48"(1220 mm).
10. Weight: 1.65-1.75 lbs./sq. ft.
11. Long Edges: Tapered.

2.6 ACOUSTICAL BACKER PANEL

A. Acoustical Backer Panel: USG Interiors, LLC, "USG Ensemble™ High-NRC Backer Panel".
1. Classification: Provide un-faced acoustical panels with the following physical attributes:
    a. NRC: Not less than 0.80.
    b. CAC: Not less than 40.
    c. Edge/Joint Detail: SQ Square.
    d. Panel Thickness: [1 inch (25.4 mm)] [2 inch (50.8 mm)]
    e. Modular Size: 16 by 48 inches (406 by 1220 mm).
    f. Recycled Content: Not less than 66%.
2. High Recycled Content Product: Classified as containing greater than 50% total recycled content. Total recycled content is based on product composition of post-consumer and pre-consumer post-industrial recycled content per FTC guidelines.
3. VOC Emissions: Meets CA Specification 01350, CHPS listed for low emitting materials.

2.7 CEILING AND WALL PANEL JOINT TREATMENT

A. Perforated Gypsum Board Joint Treatment.
1. General: Comply with ASTM C 475/C 475M, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board:
    a. USG Sheetrock® Brand Paper Joint Tape.
    b. USG Sheetrock® Brand All Purpose Joint Compound
    c. USG Sheetrock® Brand Ensemble® Ceiling Compound
2. Application:
    a. Joint Compound for Interior Gypsum Board: For each coat, use formulation that complies with USG Ensemble™ Acoustical Monolithic Ceiling System applied on previous and or successive coats.
3. Prefilling:
    a. At open joints or beveled panel edges, use USG Sheetrock® Brand Easy Sand setting-type Compound.
4. Embedding and First Coat:
    a. For embedding tape, use USG Sheetrock® Brand All Purpose Joint Compound and embed USG Sheetrock® Brand Paper Joint Tape.
5. Finish Coat:
    For finish coats on joints, fasteners, and trim flanges, as well as all 3 finish coats over joint tape, use USG Sheetrock® Brand Ensemble® Ceiling Compound. Finish to create a final coat equal to a Level 4 finish. **DO NOT** SKIM COAT OVER PERFORATIONS.

2.8 [CEILING] [AND] [WALL] PANEL SPRAY-APPLIED FINISH

A. Acoustically Transparent Finish
1. USG Interiors, LLC, “USG Ensemble™ Spray-Applied Finish”:
a. Finish: Fine Finish.
b. [Color: White (standard)]
c. [Custom Color:
a) Benjamin Moore
b) Sherwin Williams
c) Pantone]

2. Classification: Provide acrylic based spray-applied finish complying with USG Ensemble™ Spray-Applied Finish.

2.9 ACCESSORIES

A. Gypsum Board Trim Accessories.
1. Trim Accessories: Galvanized steel sheet per ASTM 1047: Provide manufacturer approved and tested metal trim that is chemically compatible with the specified ceiling system.
a. USG Sheetrock Brand Metal Trim:
a. Corner Bead
b. Reveal Joint
c. L Bead
d. U Bead
e. Control Joint
f. USG Sheetrock® Brand Paper Faced Metal Trim.

B. Extruded-Aluminum Edge Moldings and Trim.
1. Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements and the following: Provide manufacturer approved and tested metal trim that is chemically compatible with the specified ceiling system.
a. Drywall Ceilings: USG Compässo™ Elite for Drywall,
b. Drywall to upper grid ceiling: USG Compässo™ Elite Transitions

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, verify that installed building services to not interfere with work.

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

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

B. Coordination with Sprayed Fire-Resistive Materials:

1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches (610 mm) o.c.
2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.
1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install framing and accessories plumb, and true to line, with connections securely fastened.

C. Install drywall suspension grid framing, and blocking to support fixtures, equipment services, demountable partition supports, or similar construction.

D. Install bracing at terminations in assemblies.

E. This product system installation is similar to a conventional drywall installation. However, there are some differences in both materials and methods of installation that make this system unique. Installers should review and follow all directions of this installation instruction guide.

F. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMING SYSTEM

A. Suspended System
1. Determine the finished ceiling height. If the ceiling extends to the sidewalls, screw attach DGWM24 wall angle to the sidewalls at 5/8” above the finished ceiling height. Fasteners must be in the framing members. Attach hanger wires to structure above using the appropriate method. Hanger wires shall be spaced 48” OC max in each direction. Using pliers, bend the hanger wires.
2. Insert the hanger wires through the utility holes in the DGLW26 Main Tees. The DGLW26 Main Tees will run perpendicular to the cross tees at 48” OC max. The hanger wires must be within 5 degrees of plumb. Secure the DGLW-424 cross tees to the indexed support bars by snapping the clip into the cross tee holes on the main tee.
3. Space the cross tees at 16” OC. If the ceiling extends wall to wall, square up the main tees and screw attach to the DGWM24 wall angle.

B. Curved System
1. Determine the finished ceiling height. If the ceiling extends to the sidewalls, screw attach DGWM24 wall angle to the sidewalls at 5/8” above the finished ceiling height. Fasteners must be in the framing members. Attach hanger wires to structure above using the

appropriate method. For vaults, hanger wires should be spaced such that they are 48” OC along the arc of the curve. For valleys, hanger wires should be 24” OC.

2. Insert the hanger wires through the utility holes in the curved main tees. The curved main tees will run perpendicular to the cross tees at 48” OC max. The hanger wires must be within 5 degrees of plumb. Secure the DGLW-424 cross tees to the indexed support bars by snapping the clip into the cross tee holes on the main tee.
3. Space the cross tees at 16” OC. If the ceiling extends wall to wall, square up the main tees and screw attach to the DGWM24 wall angle.

C. Direct Mount System
1. Determine the finished ceiling height. If the ceiling extends to the sidewalls, screw attach DGWM24 wall angle to the sidewalls at 5/8” above the finished ceiling height. Fasteners must be in the framing members.
2. Ensure the substrate the system is being mounted on is level, then attached the Z-Furring strips 16” OC max to the substrate.
3. Screw attach the insulation impaling clips to the substrate, 48” OC along the length of the Z-Furring channel. The impaling clip should butt-up to the bottom leg of the Z-Furring.

3.5 Installing Ensemble™ High-NRC Backer Panels

A. Suspended System and Curved System
1. For high NRC system performance, lay the USG Ensemble™ High-NRC Backers in the framing system from above. The acoustical backers are 16” x 48” and lay on the back of the flanges of the main tees. Installation is similar to standard lay-in ceiling panels. Do not screw attach backer panels to the main tees.

B. Direct Mount System
1. Place the bottom of the USG Ensemble™ High-NRC Backers in the open leg of the Z-furring. While sliding it into the Z-Furring gap, also press the High-NRC Backer into the impaling clip to secure it in place.

3.6 Perforated Gypsum Board Installation

A. The USG Sheetrock Brand Ensemble™ Panels can be cut like standard Sheetrock wallboard panels using a T square and utility knife. Score the face of the panels at the desired length, making sure to cut completely through the fiberglass face scrim. Snap the panels and then cut completely through the back scrim. No marks can be made in the field of the panels unless they are covered by USG Sheetrock® brand Ensemble™ Ceiling Compound prior to spraying. (I.e. pencil, marker, or similar).

B. Fasten the perforated panels at 12” OC using 1-1/4” fine thread bugle head drywall screws. The fasteners must be in the field of the board, not the perforations. The fastener head should be just below the surface without tearing the fiberglass scrim.

C. A router or keyhole saw can be used to cut penetrations like standard wallboard.

D. Install beads and trims using the same method as standard wallboard. If the ceiling design is a floating island, trim the perimeter using Compasso Elite for Drywall.

3.7 Joint Finishing

A. The joints are finished using the USG Sheetrock® Brand All Purpose Joint Compound, Sheetrock® Brand Paper Joint Tape, and USG Sheetrock® Brand Ensemble™ Ceiling Compound. It is imperative to finish the joints as flat and level with the surface of the board as possible. Even slightly hollow or crowned joints will show as imperfections under critical lighting after the finish is applied.

B. Embed joint tape with the All Purpose Joint Compound. This can be done by hand with a joint knife, or a standard bazooka. Wipe excess with a joint knife and allow to dry completely.

C. Spot all fastener heads with USG Sheetrock® Brand Ensemble™ Ceiling Compound using a 1" or 2" joint knife. Keep the compound area small to minimize covering the perforations.

D. After the tape and bed coat is dry, apply the first coat of USG Sheetrock® Brand Ensemble™ Ceiling Compound over the joints. This can be done using hand tools or a 12" box with the blade set flat. Check for flatness with a 20" knife.

E. Apply the first fill coat of ceiling compound to all beads and trims. Apply second coat to fasteners. Allow to dry completely. Sand joints to remove any excess joint compound. A light sanding of the entire surface will help prep for the spray process but avoid over sanding the fiberglass scrim as much as possible. Apply a finish coat to the joints using a 14" offset blade knife (or similar).

F. Apply a finish coat to all beads and trims using the appropriate width joint knife so that the possibility of shadowing is minimized. Apply a third coat to the fasteners if required. Allow to dry completely. Check all joints, beads, and trims for flatness using a 20" wide knife or straight edge.

G. All joints must be filled and leveled with the surface of the board. Crowned joints must be sanded level using a flat sander. It is important to thoroughly check each joint down the entire length for flatness, not just at a few random locations.

3.8 Spray-Applied Finish

A. Note: The proper spray equipment must be used to achieve acoustical performance and esthetics.

B. Please contact your local USG Contractor Specialty Representative for specifications of required spray equipment to apply Ensemble™ Spray-Applied Finish.

C. Mask off all areas that need protecting from overspray with plastic sheathing. Use a floor protector as required. Set up the spray machine and compressor using the proper hoses. Set the air and material pressure to achieved desired finish.

D. Spray Applied Finish must be thoroughly mixed prior to application. Mix it in the 4.5-gallon container prior to filling the spray machine hopper. Using a 450-rpm electric drill and a high shear paddle mixer, thoroughly blend the finish until it has a smooth, creamy consistency. Up to 20 oz. clean, potable water may be added to achieve the proper spray consistency.

E. Check for proper consistency using the material thickness gauge provided by the spray equipment manufacturer (small steel ball). If the ball sinks completely, the fine finish is ready to spray. If the ball does not sink within 3 seconds, add more water 4 oz. at a time (up to 20 oz.) and mix thoroughly until the ball sinks.

F. Prime sprayer equipment with 5 gallons of clean potable water. With the nozzle air off, cycle water through the hose and spray gun back into the hopper for 30 seconds and then drain out the water out of the hopper. Pour the 5 gallons of mixed finish into the hopper. With the nozzle air still off, cycle the remaining water out of the hose into a separate container. When the spray finish has reached the gun, cycle the spray finish through the hose and gun back into the hopper until it is flowing smoothly through the machine.

G. The Ensemble™ Spray-Applied Finish must be applied in a minimum of four coats to achieve the proper appearance and sound performance. Apply each coat very lightly with 36" minimum gun clearance. Start in one corner and work progressively across the ceiling. Immediately cross hatch. Once the finish is dry to the touch (approx. 20-40 min), use a drywall squeegee to remove excess spray droplets, then recoat using the same technique. Apply successive coats until the desired appearance is achieved and the perforations are no longer visible through the finish.

H. After the final coat, wait 24 hours and then remove any minor irregularities with a soft rubber bladed squeegee trowel.

I. Maintain proper jobsite conditions and wear proper protective equipment (safety goggles, NIOSH-approved respirator, coveralls) while applying the finish.

END OF SECTION

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Scope of Work: For Common Areas only as shown finish schedule

B. Submittals:

1. Product Data: Include printout of MPI's "MPI Approved Products List" with product highlighted.
2. Samples.

C. Mockups: Full-coat finish Sample of each type of coating, color, and substrate, applied where directed.

D. Extra Materials: Deliver to Owner **1 gal.** of each color and type of finish-coat paint used on Project, in containers, properly labeled and sealed.

PART 2 - PRODUCTS

2.1 PAINT

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Benjamin Moore & Co.
2. PPG Architectural Coatings.
3. Sherwin-Williams Company (The).

B. MPI Standards: Provide materials that comply with MPI standards indicated and listed in its "MPI Approved Products List."

1. Block Filler, Latex: MPI #4.
2. Primer Sealer, Latex: MPI #50.
3. Primer, Alkali Resistant, Water Based: MPI #3.
4. Primer Sealer, Institutional Low Odor/VOC: MPI #149.
5. Primer, Latex, for Interior Wood: MPI #39.
6. Primer Sealer, Alkyd, Interior: MPI #45.
7. Primer, Bonding, Water Based: MPI #17.
8. Primer, Bonding, Solvent Based: MPI #69.
9. Primer, Alkyd, Anticorrosive: MPI #79.
10. Primer, Galvanized, Water Based: MPI #134.
11. Primer, Quick Dry, for Aluminum: MPI #95.
12. Latex, Interior, Flat, (Gloss Level 1): MPI #53.
13. Latex, Interior, (Gloss Level 2): MPI #44.
14. Latex, Interior, (Gloss Level 4): MPI #43.
15. Latex, Interior, Semigloss, (Gloss Level 5): MPI #54.

16. Latex, Interior, Gloss, (Gloss Level 6, except Minimum Gloss of 65 Units at 60 Degrees): MPI #114.
17. Latex, Institutional Low Odor/VOC, Flat (Gloss Level 1): MPI #143.
18. Latex, Institutional Low Odor/VOC, (Gloss Level 2): MPI #144.
19. Latex, Institutional Low Odor/VOC, Semigloss (Gloss Level 5): MPI #147.
20. Latex, High-Performance Architectural, (Gloss Level 2): MPI #138**.**
21. Latex, High-Performance Architectural, Semigloss (Gloss Level 5): MPI #141.
22. Alkyd, Interior, Flat (Gloss Level 1): MPI #49.
23. Alkyd, Interior, Semigloss (Gloss Level 5): MPI #47.
24. Alkyd, Interior, Gloss (Gloss Level 6): MPI #48.
25. Alkyd, Quick Dry, Semigloss (Gloss Level 5): MPI #81.
26. Alkyd, Quick Dry, Gloss (Gloss Level 7): MPI #96.
27. Floor Paint, Latex, Low Gloss (Maximum Gloss Level 3): MPI #60.
28. Floor Enamel, Alkyd, Gloss (Gloss Level 6): MPI #27.

C. Material Compatibility: Provide materials that are compatible with one another and with substrates.

1. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

D. Low-Emitting Materials: Section 01 8113.14 - Sustainable Design Requirements - LEED v4 BD+C

E. Colors: As selected by architect from full range of standard colors and match to architect samples. Allow for 2 Deep base colors TBD.

PART 3 - EXECUTION

3.1 PREPARATION

A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove hardware, lighting fixtures, and similar items that are not to be painted. Mask items that cannot be removed. Reinstall items in each area after painting is complete.

C. Clean and prepare surfaces in an area before beginning painting in that area. Schedule painting so cleaning operations will not damage newly painted surfaces.

3.2 APPLICATION

A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Paint exposed surfaces**,** unless otherwise indicated.

1. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces.
2. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint the back side of access panels.
4. Color-code mechanical piping in accessible ceiling spaces.

5. Do not paint prefinished items, items with an integral finish, operating parts, and labels unless otherwise indicated.

C. Apply paints according to manufacturer's written instructions.

1. Use brushes only where the use of other applicators is not practical.
2. Use rollers for finish coat on interior walls and ceilings.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

1. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

3.3 INTERIOR PAINT APPLICATION SCHEDULE

A. Concrete, Nontraffic Surfaces:
1. Clear Sealer

B. Concrete, Traffic Surfaces:

1. Low-Gloss Latex Floor Paint: Two coats: MPI INT 3.2A.

C. Concrete Masonry Units:
1. Gloss Level 2 Institutional Low-Odor/VOC Latex: Two coats over latex block filler: MPI INT 4.2E.

D. Steel:
1. Gloss Level 2 High-Performance Architectural Latex: Two coats over alkyd anticorrosive primer: MPI INT 5.1R.

E. Galvanized Metal:
1. Gloss Level 2 Institutional Low-Odor/VOC Latex: Two coats over waterborne galvanized-metal primer: MPI INT 5.3N.

F. Aluminum:
1. Gloss Level 2 Institutional Low-Odor/VOC Latex: Two coats over quick-drying primer for aluminum: MPI INT 5.4G.

G. Wood: Including wood trim architectural woodwork doors wood-based panel products.
1. Gloss Level 2 Institutional Low-Odor/VOC Latex: Two coats over latex primer for wood: MPI INT 6.3V.

H. Gypsum Board and Plaster:
1. Flat/Eggshell/Pearl Institutional Low-Odor/VOC Latex: Two coats over low-odor/VOC primer/sealer: MPI INT 9.2M.

END OF SECTION 09 9123

SECTION 101400 - SIGNAGE

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Scope Includes:
   1. ADA Compliant Room Identification Signs
      a. Toilet Rooms
      b. Utility Rooms

B. Submittals: Product Data, Shop Drawings, and Samples.

PART 2 - PRODUCTS

2.1 SIGNS, GENERAL

A. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.

2.2 MATERIALS

A. Aluminum Castings: Alloy recommended by sign manufacturer for casting process used and for use and finish indicated.

B. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

C. Plastic Laminate: High-pressure laminate engraving stock with face and core in contrasting colors.

D. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils (0.076 mm) with pressure-sensitive adhesive backing, suitable for exterior applications.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Locate signs where indicated or directed by Architect. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.

B. Wall-Mounted Signs:

   1. Two-Face Tape: Mount signs to smooth, nonporous surfaces, other than vinyl.
   2. Hook-and-Loop Tapes: Mount signs to smooth, nonporous surfaces.
   3. Magnetic Tape: Mount signs to smooth, nonporous surfaces.
   4. Silicone-Adhesive Mounting: Attach signs to irregular, porous, or vinyl-covered surfaces.

5. Mechanical Fasteners: Use nonremovable mechanical fasteners placed through predrilled holes.

C. Dimensional Characters: Mount characters at projection distance from wall surface indicated.

END OF SECTION 101400

SECTION 102113.13 - METAL TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data, Shop Drawings, and Samples.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for toilet compartments designated as accessible.

2.2 PAINTED STEEL TOILET COMPARTMENTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. All American Metal Corp.
2. Bradley Corporation.
3. General Partitions Mfg. Corp.
4. Metpar Corp.

B. Toilet-Enclosure Style: Floor and ceiling anchored].

C. Door, Panel, and Pilaster Construction: Seamless, hot-dip galvanized-steel sheets pressure laminated to core material; with continuous, interlocking molding strip or lapped-and-formed edge closures.

1. Core Material: Sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch (25 mm) for doors and panels and 1-1/4 inches (32 mm) for pilasters.
2. Internally reinforce panels for hardware, accessories, and grab bars.

D. Pilaster Shoes Manufacturer's standard design; stainless steel.

E. Brackets:

1. Stirrup Type: Clear-anodized aluminum

F. Doors: Unless otherwise indicated, 24-inch- (610-mm-) wide in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide out-swinging doors with a minimum 32-inch-

(813-mm-) wide clear opening for compartments indicated to be accessible to people with disabilities.

G. Door Hardware: Clear-anodized aluminum.

1. Hinges: Self-closing type.
2. Latches and Keepers: Surface-mounted unit designed for emergency access and with combination rubber-faced door strike and keeper.
3. Coat Hook: Combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.
4. Door Bumper: Rubber-tipped bumpers at out-swinging doors or entrance screen doors.
5. Door Pull: Provide at out-swinging doors. Provide units on both sides of doors at compartments indicated to be accessible to people with disabilities.

H. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use rust-resistant materials compatible with related materials.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units rigid, straight, level, and plumb, with not more than 1/2 inch (13 mm) between pilasters and panels and not more than 1 inch (25 mm) between panels and walls.

1. Stirrup Brackets: Align brackets at pilasters with brackets at walls. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
2. Set hinges on in-swinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors and swing doors in entrance screens to return to fully closed position.

END OF SECTION 102113.13

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 TOILET AND BATH ACCESSORIES

A. Toilet Tissue Dispenser:

1. Basis-of-Design Product: Bobrick
2. Type: Single-roll dispenser
3. Mounting: Surface mounted with concealed anchorage
4. Material: Satin-finish aluminum bracket with plastic spindle ABS plastic, gray.
5. Operation: Noncontrol delivery with standard spindle
6. Capacity: Designed for 4-1/2- or 5-inch- (114- or 127-mm-) diameter-core tissue rolls

B. Paper Towel Dispenser:

1. Basis-of-Design Product: Bobrick
2. Mounting: Recessed.
3. Minimum Capacity: 400 C-fold or 525 multifold towels
4. Material: Stainless steel, No. 4 finish (satin)
5. Lockset: Tumbler type.
6. Refill Indicators: Pierced slots at sides or front.

C. Waste Receptacle:

1. Basis-of-Design Product: Bobrick B-369 Classic Series

D. Liquid-Soap Dispenser:

1. Basis-of-Design Product: Bobrick B-2012 Automatic Wall-Mounted Soap Dispenser

E. Grab Bar (see drawings for configurations):

1. Basis-of-Design Product: Bobrick.
2. Material: Stainless steel, 0.050 inch (1.3 mm) thick.
3. Mounting: Concealed
4. Gripping Surfaces: Slip-resistant texture.
5. Outside Diameter: 1-1/4 inches (32 mm) for medium duty applications.

F. Mirror Unit:

1. Basis-of-Design Product: Bobrick Side lit Mirror B-169 Series

G. Coat Hook: Bobrick B-549 Double Coat Hook

H. Towel Bar:

1. Basis-of-Design Product: Bobrick B-545 and B-5456 Surface-Mounted Towel Bar

I. Underlavatory Guard:

1. Basis-of-Design Product: Bobrick
2. Description: Insulating pipe coverings for supply and drain piping assemblies, which prevent direct contact with and burns from piping and allow service access without removing coverings.
3. Material and Finish: Antimicrobial, molded plastic, white.

2.2 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, No. 4 finish (satin), 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B 19, ASTM B 16/B 16M, or ASTM B 30.

C. Sheet Steel: ASTM A 1008/A 1008M, 0.036-inch (0.9-mm) minimum nominal thickness.

D. Galvanized-Steel Sheet: ASTM A 653/A 653M, G60 (Z180).

E. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

F. Baked-Enamel Finish: Factory-applied, gloss-white, baked-acrylic-enamel coating.

G. Mirrors: ASTM C 1503, mirror glazing quality, clear-glass mirrors, nominal 6.0 mm thick.

H. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

I. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.

J. Keys: Provide universal keys for internal access to accessories for servicing and resupplying.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

1. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.

B. Adjust accessories for unencumbered, smooth operation, and verify that mechanisms function properly. Replace damaged or defective items. Remove temporary labels and protective coatings.

END OF SECTION 102800

SECTION 104400 - FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 FIRE-PROTECTION CABINETS

A. Fire-Protection Cabinets: Enameled-steel, semirecessed cabinets for fire extinguisher.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Guardian Fire Equipment, Inc.
b. JL Industries, Inc.; a division of the Activar Construction Products Group.
c. Larsens Manufacturing Company.

B. Cabinet Construction: Nonrated

1. Fire-Rated Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating indicated. Constructed with double walls fabricated from 0.043-inch-(1.09-mm-) thick, steel sheet lined with fire-barrier material.

C. Cabinet Material: Steel sheet.

1. Trim Style: Trimless
2. Trim Material: Steel

D. Door Material: Aluminum

1. Door Style: Extruded Aluminum
2. Door Glazing: Acrylic.

2.2 FIRE EXTINGUISHERS

A. Portable Fire Extinguishers: NFPA 10, listed and labeled for the type, rating, and classification of extinguisher.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. JL Industries, Inc.; a division of the Activar Construction Products Group.
b. Kidde Residential and Commercial Division.

c. Larsens Manufacturing Company.

2. Multipurpose Dry-Chemical Type: UL-rated 3-A:40-B:C, 6-lb (2.7-kg) nominal capacity, in enameled-steel container.

B. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for fire extinguishers indicated, with plated or baked-enamel finish.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cabinets at 54 inches (1372 mm) above finished floor to top of cabinet unless otherwise indicated acceptable to authorities having jurisdiction.

END OF SECTION 104400

DIVISION 26 00 00- ELECTRICAL WORK

ELECTRICAL SPECIFICATIONS

LARIMER
GYM/AUDITORIUM REMODELING PHASE 2
PITTSBURGH, PA

PFAFFMANN ARCHITECTS
223 4TH AVENUE, SUITE 800
PITTSBURGH, PA 15222
TEL: 412-471-2470

CAPLAN ENGINEERING COMPANY
7531 ROSLYN STREET
PITTSBURGH, PA 15218
TEL: 412-271-4700

JULY 15, 2023

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SECTION 26 00 01

BASIC ELECTRICAL REQUIREMENTS

A. RELATED DOCUMENTS

Drawings and general provisions of contract, including general and supplementary conditions and Division 1 Specification sections, apply to work specified in this section.

B. GENERAL PROVISIONS

The Architectural General Conditions and Special Conditions listed in Division 1 are hereby made a part of each Section in Division 26 00 00 and shall apply to all the following work.

Electrical work will be let by the Owner, subject to the Instructions to Bidders and to all Addenda and Bulletins hereafter made part of these specifications. Refer thereto for instructions regarding specific job conditions.

Observe all special instructions in regards to working conditions and miscellaneous items as directed by the Architect, Engineer, and Owner.

C. DEFINITIONS

The terms "provide", "provide and install", and "furnish and install" shall be interpreted to be identical terms.

The term "approved" shall be interpreted to mean "as approved by the Architect/Engineer".

D. SCOPE OF WORK

Furnish all labor, materials, equipment, transportation, tools, supervision and services necessary for the installation and proper completion of all electrical work as herein specified and/or as shown on the drawings.

Install all systems complete, unless otherwise noted, and leave in first class operating condition, satisfactory to the Architect, Engineer, Owner.

Electrical work shall include but is not necessarily limited to the following:

1. Provision of temporary light and power as specified hereinafter.

2. Electrical distribution @ 120/208 volts, 3 phase, 4 wires, as indicated, beginning at the existing main switchboard.

3. Provision and installation of all required sub-distribution equipment, panels, feeders, branch circuits, etc.

4. Provision and installation of all required lighting fixtures for interior use.

5. Telephone Conduit Distribution System, as shown.

6. Data Conduit Distribution System and wiring, as shown.

7. Provision and installation of emergency battery units and exit signs as required by local or state codes.

8. Fire Alarm System additions, installed complete, as shown.

9. Wiring for HVAC and Plumbing Contracts including all power wiring 120 volts and higher.

10. All required Power and Control Wiring for miscellaneous motors, and Owner's Special Equipment as shown on the drawings.

11. Provision and installation of all miscellaneous items as shown on the drawings and/or as specified hereinafter.

E. ALTERNATES

There are no electrical alternates in the Base Bid.

F. WORK OR ITEMS BY OTHERS

Wire to and connect the following items which will be furnished and installed by others:

1. Heating, Ventilating and Air Conditioning and Plumbing Equipment
2. Starters for the above items.

G. SPECIFICATIONS

These specifications complement the Electrical Drawings. Execute any item drawn and not specified or specified and not drawn as fully as if both drawn and specified in order to insure a complete installation.

In the event of a conflict between the drawings and the specifications, the more stringent requirement will be applicable. Install any item specified and not drawn, or vice versa, as completely as if both shown and specified.

H. CONTRACT DRAWINGS

The Electrical Drawings constitute an integral part of the Contract and shall serve as the working drawings. For purposes of clarity and legibility, the drawings are essentially diagrammatic, although the sizes and locations of equipment are shown to scale wherever possible.

Make use of all the data in all the Contract Documents and finally verify indicated information against field conditions.

The Architectural and Structural Drawings take precedence over the Electrical Drawings in the representation of the general construction work. Refer to these drawings in order to coordinate the electrical work with the other work on the premises.

Due to the scale of the drawings, it is not possible to indicate all conduits, conductors, connectors, fittings, boxes, switches and other miscellaneous parts which may be required. Investigate the structural and finish conditions affecting the work and arrange the new work accordingly, furnishing such parts and equipment as may be necessary for this installation.

Incorporate the related Heating, Ventilating, Air Conditioning and Plumbing Drawings and Specifications into this Electrical Set. Obtain copies of these documents to ascertain the extent of work which requires electrical wiring and final connections in order to include all necessary items and work in the base bid.

Be responsible for obtaining supplier's field drawings for use when "roughing-in" wiring for all mechanical items.

The Electrical Drawings indicate the required conduit sizes and points of termination and the number and size of the wires therein but do not suggest the proper routing of these raceways. The preparation of field drawings, if required, is the contractor's responsibility.

I. VERIFICATION OF INFORMATION

Confer with the several mechanical contractors to verify sizes and locations of Heating, Ventilating, Air Conditioning and Plumbing electrical equipment and their controls.

Verify exact locations, electrical requirements and final connections of special equipment at the site.

J. PERMITS, LICENSES AND INSPECTIONS

Obtain and pay for all permits and licenses required for the execution of the work in advance of construction.

Arrange for all tests and inspections of the work required by the authorities having jurisdiction and pay all costs.

Obtain all certificates of inspections and approval from all authorities having jurisdiction and deliver them to the Architect, Engineer, Owner as a prerequisite for acceptance of the work.

Obtain an inspection made by the City of Pittsburgh, Electrical Inspection Department.

The Contractor shall meet with the local inspector to review all of the plans and specifications, prior to the start of construction. Any problems or deficiencies in the work shall be brought to the Engineer's attention, in writing, at that time. Notify the Engineer in writing, identifying the date and time of the meeting, the name and phone number of the inspector, and the specific plans and specifications which were reviewed. State either the corrections required or "no deficiencies encountered" in the letter. Submit same within 30 days after award of contract.

K. REGULATIONS AND CODES

Conform to the requirements of the Contract Drawings and Specifications, the latest rules of the National Electrical Code and with local ordinances having jurisdiction. Do not interpret anything in the Drawings or Specifications as authority to violate applicable codes.

Obey all standards pertaining to adequate protection against a hazardous condition, provision of guards for moving parts and clearances from pressure vessels, switchgear, and transformers.

Comply with the requirements of the local public utilities which will be rendering service.

Be responsible for examining Drawings and Specifications for compliance with applicable codes.

Resolve all conflicts before installation at no extra cost.

Prepare any additional clarifying details required by the local inspection authorities and secure approval of same. Pay any charges.

Observe all International Building Code requirements.

Observe all applicable safety regulations required by Owner and/or by OSHA.

Observe all requirements for emergency lighting and exit signs as listed in the latest edition of the International Building Code.

L. INTERPRETATIONS AND CONFLICTS

Bring any discrepancies between different drawings, between the drawings and field conditions, or between the drawings and the specifications, or any apparent omissions, to the Architect/Engineer's attention before submitting the bid. After award of contract, the interpretation of any conflict will be made by the Architect/Engineer and shall be accepted as final.

The failure to question any controversial item will constitute acceptance by the Bidder who shall execute same to the satisfaction of the Architect and Engineer after being awarded the Contract.

Submit details of any desired departures from the Contract Documents as may be deemed necessary, and the reasons therefore, within 15 days after award of contract. Make no departures without written approval.

If mention has been omitted pertaining to details, items or related accessories required for the completion of any electrical system, include such items and accessories in the electrical contract without additional charges.

After the job is awarded, claims based on insufficient data or incorrectly assumed conditions, or claims based on misunderstanding the nature or character of the work or the conditions under which it must be performed, will not be recognized.

Prior to submitting the bid, resolve any apparent conflicts in regard to locations, interferences and jurisdiction.

The Contractor shall not interpret this project to be a "Minimum Code Design" or an "Industry Standard Design". Where materials or methods shown on the drawings, or specified herein, indicate a premium material or method, the Contractor is expected to provide the same. Excuses such as "it meets NEC requirements" or "this is the industry standard" will not be recognized as justification for acceptance of items not conforming to the intended design.

M. WORK SCHEDULE

Schedule all electrical work to conform to the General Contractor's work schedule.

Cooperate with the General and other Mechanical Contractors in scheduling work to avoid delay and interference with one another.

N. CHANGES IN THE WORK

Do not install work for which an extra charge is to be made without written approval.

State in a written request for extra work the nature of the work, by whom requested, the price to be charged and an itemized breakdown for each item.

Advise the Architect immediately if any added cost is involved by changes made on superseded drawings. Do not proceed with the changed item until approval has been given in writing.

Be responsible for notifying the other trades of the electrical changes in order that they may coordinate their work in this regard.

O. VOIDING OF ENGINEER'S PROFESSIONAL RESPONSIBILITY

This Contractor shall not redesign any part of the electrical work on his own initiative unless he is willing to assume total responsibility for the complete electrical installation. In this case, he shall formally relieve the original Engineer of any further responsibility in writing. Furthermore, the Engineer's seal shall be deleted from all documents to which it is attached.

Any substantial deviation from the plans and/or specifications for the work covered by this section of the specifications, or any substitutes or alternates that are incorporated into the work, without the approval of the Designing Engineer, shall relieve the Designing Engineer of all professional responsibility, reliability and longevity of the completed work. All such responsibility shall accrue, thereupon, to the party making

such changes and, in the absence of evidence to the contrary, the legal entity, its heirs, assigns, or successors, responsible for the work of the particular section concerned shall be responsible, holding Architect, Design Engineer and Owner harmless.

P. STANDARDS OF WORKMANSHIP

All electrical work shall meet or exceed the standards of installation and good workmanship as set forth in the latest copy of the National Electrical Contractors Association publication entitled "NECA Standards of Installation", except as otherwise modified in these specifications or shown on the Contract Drawings.

The Architect/Engineer reserves the right to direct the removal of any item which does not comply with the Contract Drawings or these specifications, or does not present a neat, orderly and workmanlike appearance.

Q. JOB RESPONSIBILITY

Provide adequate storage facilities for materials and equipment during the progress of the work.

Be responsible for the condition of all materials and equipment employed in the electrical installation until final acceptance by the Architect, Engineer and Owner.

Make good any damage to the work caused by floods, storms, accidents, acts of violence and theft, up to the time of final acceptance by the Architect, Engineer and Owner.

Be responsible for the replacement of all damaged or defective work, materials or equipment. Do not install the lighting or special equipment until major construction work is completed.

Erect and maintain barrier lights and warning signs for the protection of transients, occupants, public and employees from danger due to work under this Division.

Be responsible for any loss or injury to persons or property resulting from neglect or any other cause on the part of employees.

Do not leave any electrical work in a hazardous condition, even temporarily. Cover open trenches nightly. Mark same with electric lights or battery-operated blinkers.

Erect, maintain and finally remove all scaffolds, staging, forms, platforms and ladders required for the electrical installation.

R. GUARANTEE

Fully guarantee in writing all materials and workmanship installed under this Contract against defects for a period of one year from the date of final acceptance of the work by the Owner.

For factory assembled equipment and devices on which the manufacturers furnish standard published guarantees as regular trade practice, obtain such guarantees and replace any such equipment which proves defective during the life of these guarantees.

Guarantee all work for which materials are furnished, fabricated or field erected by the Contractor, all factory assembled equipment for which no specific manufacturer's guarantee is furnished, and all work in connection with installing manufacturer's guaranteed equipment.

In the event of failure of any work, equipment or devices during the life of the guarantee, repair or replace the equipment or defective work. Remove, replace or restore, at no cost to the Owner, any parts of the structure or building which may be damaged either as the direct result of the defective work or materials.

Work shall be done at a time and in a manner as to cause no undue inconvenience to the Owner.

See Division 1 for further requirements on Guarantee.

S. OWNERSHIP OF DOCUMENTS

END OF SECTION 26 00 01

SECTION 26 00 02

BASIC ELECTRICAL METHODS AND PROCEDURES

A. RELATED DOCUMENTS

Drawings and general provisions of contract, including general and supplementary conditions apply to work specified in this section.

B. VISITING THE SITE

Visit the present installation to ascertain the existing site conditions, to determine the location of any existing electrical equipment and to note the routing and lengths of the new conduit installation.

Immediately notify the Architect/Engineer of any condition or item observed which may affect the bid. Addenda will be issued to all Bidders if necessary.

Make all visits to the Site during the normal work day and week. Schedule visits in advance with the Owner's representative.

Secure and verify all dimensions at the Site.

Any failure by the Electrical Contractor to acquaint himself with all available information and existing conditions will not relieve him from the responsibility of performing a complete job, nor will any extra compensation be granted him for his failure to observe and account for an obvious condition in his bid.

C. TEMPORARY LIGHT AND POWER

When required by the General Contractor, provide a temporary service for construction use.

Lighting installation shall meet O.S.H.A. regulations for intensity of illumination, spacing of luminaires and safety.

Extend wiring for lighting, as required by the General Contractor.

Install 120 volt cord sets with ground fault protection as per the N.E.C. latest requirements.

Maintain the electrical equipment and lamps for the temporary facilities.

Repair or replace any damage to the building resulting from the temporary installation. Repairs shall be satisfactory to the Architect/Owner.

When temporary lighting and outlets are no longer required, remove all temporary lines when notified to do so by the General Contractor.

Three phase, 208 volt or 480 volt temporary power will not be provided in the base contract. Where a service of a type other than the 120 volt service is required, such as 208 volts or 480 volts, the Contractor requiring same shall pay all costs for such special service.

Reuse the existing building service for temporary lighting.

D. SLEEVES, CHASES, CUTTING, PATCHING AND FLASHING

Furnish and place all sleeves in new construction as required for conduits passing through floors, beams, walls and ceilings before the new general construction work is built into place. Install all inserts for hangers and supports as the work progresses to avoid unnecessary cutting.

Do all cutting of new or existing walls, floors and ceilings as necessary to install electrical items under the direction of the General Contractor.

Use a core drill to cut openings in finished concrete. Do not chip with a hand tool.

Chases will not be provided for any raceways which are to be installed concealed.

Do not endanger the stability of the structure or any part thereof by cutting, burning, digging or otherwise.

Do all rough and finished patching of disturbed areas.

Do any cutting, patching and painting required to install, revise or complete electrical work after the walls or floors are finished.

Flash all conduit openings in the roof. Provide a flashing collar securely attached to each conduit. The roofer will do all finish work to complete this installation at the Electrical Contractor's expense.

Locate the feeder to any equipment on the roof under the equipment or in the sleeves or space provided in a prefabricated curb.

E. PAINTING

Painting is included in the Electrical Division as per the following paragraphs.

Touch up any panels, switch boxes or apparatus scratched, damaged or rusted during construction.

Paint any exterior brackets or equipment which are not factory painted or constructed of a material which requires protection.

Paint all access panels to match the surfaces in which they are installed.

F. DETERMINATION OF LOCATIONS

Carefully examine the drawings of all other trades and note all locations of work by others in relation to electrical work to avoid conflict and interference.

Determine the final locations of all parts of the work as the job progresses. The Contract Drawings are intended to show only the general scope of the work and approximate locations.

Cooperate with the other trades where interferences occur. Relocate outlets, conduits and devices as required to solve minor problems. Consult with the Architect if a condition occurs that cannot be resolved by the trades involved and accept his decision as final.

The Architect/Engineer reserves the right to make minor changes in outlet locations up to the time of "roughing-in" at no extra expense to the Owner.

Drawings indicate the approximate locations of outlets, apparatus, and equipment. The runs of feeders and branches as shown are schematic. Final routing shall be governed by structural conditions and other obstructions. This shall not mean that the design of a system may be changed; it merely refers to the exact routing of a raceway between given points.

Install raceways with all necessary offsets, junction and pull boxes, in such a manner as to conform to the structure, preserve headroom and satisfying the requirements of the governing codes and the standards of good practice.

Lay out electrical work from the dimensions shown on the architectural and structural drawings. Use the actual dimensions of equipment being installed.

Do not scale the layouts in congested areas from the mechanical or the electrical drawings.

G. EQUIPMENT SIZES

Note that the Engineer has located equipment based on the dimensions of one or more of the manufacturer's listed.

During the Bidding Period, check and verify that all dimensions of the equipment which are intended to be supplied will fit in the space allotted. Check Architectural drawings for room dimensions and ceiling heights.

Be responsible to provide all required N.E.C. clearances around the Electrical equipment.

The Electrical Contractor shall be responsible to maintain all required NEC Code Clearances above Main Switchboards, Distribution Panels and Branch Panelboards. Nothing shall be located in the space above these panels to the structural ceiling, or at minimum, for a distance of 6'-0" above the panels.

Submittals of equipment which exceeds the allotted space in the building will be rejected even if the manufacturer of the equipment is listed as being acceptable.

H. GROUNDING AND BONDING

Provide all electrical system grounding and bonding as required by the National Electrical Code.

Make good contact at all panels, boxes and wherever a conduit run is broken. Ground and bond all conduit, fixtures, motors and other apparatus in a permanent manner. The use of sheet metal screws to connect the grounding conductor to metal enclosures is not permitted.

Ground all lighting fixtures and convenience outlets as required by the National Electrical Code.

Properly ground plumbing equipment such as water coolers and water heaters.

Provide a single green ground wire to each panel or motor. Run this wire in the same conduit feeding same. Increase the conduit size if necessary. Size same in accordance with the N.E.C. but not smaller than #12 AWG. Attach the ground wire to the grounding terminal in each connection box.

Properly bond all conduits, metal raceways, boxes, cabinets, motors and equipment, whether such bonding is required by the National Fire Protection Association or not. Size the bonding and grounding wires to conform with Article #250, Tables 66 and 122 of the National Electrical Code. Use only the equipment bonding system for the bonding of all non-current carrying parts of electrical equipment.

Ground receptacles and power outlets to the conduit system with a Type THHN/THWN green grounding conductor, sized in accordance with NEC-Table 250-122. Connect between the device's grounding screw and the outlet box. Connect to the box with a Steel City "G" clip or by a 1024 screw, threaded into a hole in the back of the box and use for no other purpose.

Be careful to maintain bonding continuity in boxes with concentric knockouts. Provide all required external grounding bushings as required by the National Electrical Code.

Connect motorized equipment to the electrical system with liquid-tight conduit approved as a grounded connector.

Supply the main devices with an equipment ground bus adequately sized per the N.E.C., Article 250. Connect the grounded service conductor to the neutral bus of the main devices. Use a properly sized bonding jumper to bond the neutral bus and the ground bus together. Bond the ground bus to the ground electrode via a grounding conductor sized as per N.E.C. Table 250-66.

Properly ground all air conditioning and ventilating equipment.

Metallic enclosures, raceways, or cable armor shall not be used for continuity of grounded conductors.

I. LIST OF MATERIALS

Submit to the Architect/Engineer for preliminary approval, four (4) copies of a complete list of all materials proposed for use in the electrical systems covered by these specifications within 15 days after the award of contract. Include 1 digital copy.

Identify each lighting fixture by the manufacturer's name and exact catalog number.

Identify other electrical items by the name of the manufacturer and the trade name of the item.
In the event no list is submitted within the allotted time, the Engineer will have the option to select the exact brand to be furnished from the manufacturers listed herein.

J. SUBSTITUTIONS

Manufacturers names and catalog numbers are listed to establish the exact brand and style of item desired by the Architect/Engineer. Submit the original quotation based on materials of the manufacturers as specified.

If more than one name is mentioned, the choice is left to the Contractor. This does not mean that an unnamed brand may be used.

Submit with the Contract Proposal, any request for using a substitute item, material, or method. Include the credit (or addition) to be allowed in the total job price for the use of this item, items or method. Do not submit on any item which has not been reviewed prior to bid by the Architect/Engineer as hereinafter listed.

Make any request for the review of a substitute item or method at least ten (10) days in advance of the bid date, to allow the Engineer sufficient time to evaluate the same. Such review will not guarantee that the item will be acceptable without a suitable credit.

In the event the substitution is approved, be responsible for all mechanical, electrical and structural changes required by the use of the substitute material or item. Notify all trades involved.

K. SUBMITTAL OF SHOP DRAWINGS AND BROCHURES

Immediately following the awarding of the contract, submit shop drawings, brochures and/or descriptive literature for review to the Architect/Engineer in accordance with the General Contract.

Carefully assembly and thoroughly check all shop drawings for correct information, clarity and completeness.

Manufacturers who are unwilling to produce professionally assembled shop drawings in accordance with this section will not be accepted for this project.

Contractor shall obtain prior approval from the Engineer 10 days prior to Bid to submit any proposed alternate unnamed manufacturer for consideration.

If extensive changes in the conduit arrangement and equipment layout are brought about by the use of equipment other than the brand named in the specifications or not compatible with the layout shown on the drawings, provide drawings showing these changes and include any additional work deemed necessary in the Contract at no additional charge.

Itemize the drawings submitted in the transmittal letter. Stamp the drawings with the Contractor's seal as evidence that the drawings have been thoroughly reviewed by the Contractor for compliance with the Contract Drawings.

Submit shop drawings, such as Panels, Fire Alarm, Wiring Devices, Lighting, etc. in complete groups for each material category.

Submit 3 paper copies + 1 digital copy. Arrange all shop drawings in binders with index and tabbed sections. Assemble all categories in one submission package.

Submit complete brochures on lighting fixtures and on other materials. Do not send individual cuts for a partial submission of any category.

Index the shop drawings and circle all relevant items on each page. Cross out all irrelevant items which do not apply.

On substituted items indicate the differences between the same and the specified item.

Shop drawings which do not conform to the above instructions will be rejected and returned or discarded without being reviewed.

Review and acceptance of any shop drawing shall not be construed as a Change Order.

The above review shall not relieve the Contractor from his responsibility for any deviations in the original design unless he specifically calls attention to these variations in writing at the time of submittal. Submit a separate letter document describing these variations with the shop drawing submittal.

The above review shall not relieve the Contractor of his responsibility for any errors in the Shop Drawings.

Submit manufacturers or suppliers shop and/or field drawings on all items which require special fabrication. Drawings are required for the following items:

1. Panelboards
2. Fire Alarm System Additions

Submit brochures for the following:

1. Plastic Nameplates
2. Raceways
3. Outlet Boxes
4. Conductors
5. Safety Switches
6. Wiring Devices and Plates
7. Fire Stops
8. Lighting Fixtures/Lamps
9. Telephone/Data Wiring/Devices
10. Special System Devices
11. Conductor Color Coding Charts
12. Fire Alarm Devices

Drawings and brochures will be promptly processed and returned to the Contractor. Do not proceed with the order until the approved submittals are received.

L. SAMPLES

Samples may be requested on any item at the option of the Architect/Engineer.

Approved samples may be utilized in the construction; samples not approved will be returned.

M. MARKING AND IDENTIFICATION

Clearly mark all panels, disconnect switches, starters, control devices and miscellaneous electrical apparatus for easy identification and for safety.

Type all circuit directories on suitable cards which shall fit into the holders in the panelboard doors. Cards shall indicate the use of each circuit and in which space the circuit is utilized.

Tag all circuit line conductors in lighting and power panels with gummed number labels to indicate circuit numbers.

In buildings utilizing circuit breaker style main breakers in conjunction with circuit breaker style panelboards, Contractor shall provide suitable nameplates inside the panelboards as per NEC Section 110.22. Nameplates shall read "Caution-Series Rated System; Identical Component Replacement Required". "Additional Series Combination Interrupting Capacity is ___, ___ RMS Symmetrical Amperes". Furthermore, provide and install nameplates in any branch panelboard showing its interrupting capacity where such indication is not provided by the manufacturer's nameplate.

Provide plastic embossed nameplates on all equipment of the type listed below:

1. Panelboards
2. Pull Boxes
3. Starters
4. Main Breakers

Lettering on nameplates shall include the name of the equipment, voltage and phase, specific unit number (i.e. each switch unit in the main switchboard), any reference to on-off or other instructions which are applicable and conductors contained in the case of pull boxes.

All nameplates shall be made of laminated phenolic with a black surface and white core. Use a 1/16" thick material for plates up to 2" X 4". For larger sizes use 1/8" thick material. Provide similar red plates with white letters for fire/smoke alarm systems.

Lettering shall be condensed gothic. The space between lines shall be equal to the width of the letters. Use ½" minimum height letters which occupy four to the inch. Increase letter size to 3/4" on larger plates.

Verify nameplate lettering requirements with the Engineer before making up the nameplates.

The use of punched tape for marking purposes is not acceptable.

The Electrical Contractor shall provide and install stick-on warning labels with ½" high letters on all panelboards. Panelboard labels shall be on the inside of the trim's door panel. Labels shall read:

> "WARNING!! POSSIBLE ARC-FAULT, ARC-FLASH, AND SHOCK HAZARDS EXIST ON ENERGIZED EQUIPMENT. SERVICE WORK SHALL BE PERFORMED BY QUALIFIED PERSONNEL ONLY, AS DEFINED BY NEC AND NFPA 70E. APPROPRIATE PERSONNEL PROTECTIVE EQUIPMENT IS REQUIRED."

In the Electric Room, Sprinkler Room, etc., E.C. shall provide engraved nameplates of each equipment item or panels, main switches, fire alarm cabinet, etc. for Fire Department reference.

All low voltage cables shall be tagged at all termination points and in all junction boxes. Labels shall show the following information: System name, source and load termination points and system voltage.

N. CLEAN UP

Perform the installation in a neat and orderly manner.

Be responsible for cleaning up electrical work and hauling away debris daily. Exercise due care in the handling of waste materials, scrap items and paper. Periodically remove electrical waste materials, paper and rubbish. Maintain order. On completion of the job, remove all tools, equipment, materials and loose parts.

Fingerprints and smears on ceilings and painted walls will not be tolerated. Restore all areas to their original clean condition, satisfactory to the Architect/Engineer/Owner.

Leave all lighting plastic and glassware in a clean condition. Wash with a detergent and air dry.

Clean and polish all finished metal surfaces. Remove dust, rust, cement and plaster from all electrical items. Scrape out all cracks and corners. Remove oil spots and grease. Leave all unfinished surfaces smooth and dry, ready for painting.

Remove all grease and oil caused by the work under this Division from floors, walls, ceilings and fixtures.

Leave the premises clean, free from all debris and unused construction materials.

Do a final clean up at the job's conclusion.

O. TESTS

Upon completion of the work, and as a condition for acceptance, test all systems in the presence of the Architect/Engineer/Owner. Retest equipment requiring correction.

Make all tests in accordance with requirements of the local authorities having jurisdiction.

Test secondary wiring for continuity, short circuit and improper grounds, and show an insulation resistance between conductors and ground not less than the requirements of the National Electrical Code.

Operate each lighting circuit to test every fixture.

Perform all tests for items furnished by another Contractor for installation by the Electrical Contractor in the presence of that Contractor to determine satisfactory operation and performance of function intended.

Correct all failures or improper operations. Furnish all necessary testing equipment and pay all costs of testing, replacing and repairing.

Retest items until satisfactory performance is obtained at no additional charge.

P. LOAD BALANCE AND PHASING

Properly balance the building electrical loads across phases of all lighting and power panels, transformer terminals, and service entrance conductors. When all loads are turned on, the initial unbalance shall not exceed 10%.

Provide for the correct direction of rotation of all motorized equipment.

Q. RECORD DRAWINGS

During the construction period, maintain in good order, a complete set of blue line electrical contract drawings. Record the actual electrical installation as the work progresses. Include all changes to the contract and to equipment sizes and types. Keep these drawings available at the site at all times for inspection.

Take proper caution against the use of superseded drawings. Check all such copies and mark "VOID".

Where drawings have been corrected by memorandum, assume the responsibility for marking all drawings so affected with the changes; such marked drawings shall remain in use until revised drawings are issued.

At the conclusion of the work, obtain a set of white prints or sepias from the Architect. Incorporate all field revisions in a clear legible manner. Return such marked prints or sepias within 30 days.

R. INSTRUCTIONS TO OPERATING PERSONNEL

Furnish the services of a person or persons who is thoroughly familiar with the completed installation, to instruct the Owner's operating personnel in the proper operation, care and maintenance of all electrical apparatus and systems.

Furnish these services for at least one four hour period. During this time demonstrate to the Owner, in the presence of the Architect/Engineer, the complete operation of the various electrical systems.

Deliver manufacturer's certificates of tests and performance to the Architect/Engineer/Owner.

S. OPERATING INSTRUCTION MANUAL

Assemble a written manual of operating instructions including copies of all shop drawings and a listing of equipment suppliers into an 8-1/2" X 11" hard-backed indexed binder.

Specific items to be included are:

1. Electrical Gear (All Items)
2. All Special Electrical Systems
3. Fire Alarm System
4. Lighting Fixtures
5. Copies of all Panel Directories
6. All Guarantees and Warranties
7. List of Contractors with Addresses and Telephone Numbers

Submit one completed copy entitled ELECTRICAL OPERATING INSTRUCTION MANUAL on the binding edge of the binder to the Architect for approval. After the Architect's review and any corrections resulting therefrom are completed, submit four (4) identical copies of the manual to the Architect for distribution.

END OF SECTION 26 00 02

SECTION 26 20 02

BASIC ELECTRICAL MATERIALS AND INSTALLATION

A. RELATED DOCUMENTS

Drawings and general provisions of contract, including general and supplementary conditions and Division 1 Specification Sections, apply to work specified in this section.

B. MATERIAL IN GENERAL

Materials shall be new, tested and listed by Underwriters Laboratories, and shall bear the Underwriters Label where such labeling service is furnished. Materials shall meet with the approval of all State and Local governing bodies having jurisdiction.

Materials shall be manufactured in accordance with the latest applicable standards established by ANSI, NEMA, ASTM and IEEE.

All similar materials shall be manufactured by the same manufacturer.

All materials within the following group classifications shall be manufactured by a single manufacturer, unless approved otherwise in writing by the Engineer, in advance.

1. Panelboards, Disconnect Switches, etc.

2. Wiring Devices and Plates

3. Any Special System

In all cases where equipment and materials are specified in the singular number, such reference shall apply to as many such items as are required to complete the installation.

Installation shall be made on the basis of specified materials.

All items employed on the job shall be approved by the Architect/Engineer or Owner.

C. RACEWAYS

1. Materials

Heavy wall style raceways shall be steel, hot dipped galvanized and zinc coated, inside and outside, with threaded ends and attached couplings. Conduit shall bear manufacturer's and Underwriters' labels. Heavy wall conduit is designated as G/R/S.

Electric metallic tubing shall be steel, hot dipped galvanized and zinc coated, inside and outside. E.M.T. shall bear the manufacturer's and Underwriters' labels. Thin wall conduit is designated as E.M.T.

Steel conduit shall be manufactured by Wheatland, Allied, Triangle, or equal.

Flexible conduit (Greenfield) shall be U.L. listed, 3/4 inch minimum trade size for branch wiring. Greenfield of ½ inch size will be permitted for final connections to lighting fixtures only.

Branch circuit raceways in finished areas shall be wiremold or equal, ivory finish. All routings shall be approved by the Architect in advance.

Liquid-tight flexible conduit shall be complete with an internal ground and shall conform to NEC 250-118.

Flexible conduit shall be manufactured by Alflex, Allied or approved equal manufacturer.

2. Installation

Minimum size conduit is 3/4 inches.

Install conduit as a complete system, continuous from outlet to outlet, cabinet, box or fitting, mechanically and electrically connected so that adequate electrical continuity is secured.

Where required, use approved conduit unions. The use of running threads will not be permitted.

Use factory bends and fittings on all conduits larger than 3/4 inches trade size. Bend conduits sized 3/4 inches with an approved hickey or bending machine.

Do not install crushed or deformed conduit.

When cutting a length of 3/4 inch conduit, use only a hacksaw. Take care to secure square ends. The use of a pipe cutter will not be permitted.

Carefully ream the ends of all conduit after threading. Take particular care to cut the conduit to the exact length to fit between the outlet boxes.

Do not pass conduits through structural members except as directed by the Architect. Provide sleeves in new construction for passing conduits through floors and walls. Use fire seals where required by Code.

Use a core drill to cut openings for conduit in finished concrete. Do not chip with a hand tool.

Provide inserts for hangers and supports as general installation progresses.

Adequately support all raceways and enclosures from elements of the building structure with approved support rods and/or clamps.

Fasten conduits throughout the work securely and rigidly in place with supports spaced not more than 10 feet apart and a support provided not more than 3 feet from any outlet.

Securely support all conduit by means of hangers or strap fasteners. Where conduits are fastened to solid masonry walls, use screws or bolts in conjunction with approved lead alloy expansion sleeves. For strap fasteners, use one or two hole malleable iron style.

Fasten conduit placed against concrete with pipe straps or one-screw conduit clamps attached to the concrete by means of expansion anchors and screws.

Do not strap or fasten rigid conduit or electrical metallic tubing to equipment subject to vibration or mounted on shock absorbing bases.

Do not install any raceway system in such a manner that it rests on lay-in ceiling tile or prevents the removal of tile. Provide an independent means of support for all raceways located above a drop ceiling assembly from the structural ceiling assembly. Do not support raceways from the ceiling assembly or from its support wires.

Size the raceways as noted on the drawings, or in the absence of notation, size the raceways to comply with NEC fill requirements for the conductors enclosed therein.

Where raceways extend through exterior walls or pass from one temperature area to another temperature area, an approved sealing compound shall be applied inside the raceway portion or fitting.

D. CONDUIT FITTINGS

1. Materials

All conduit fittings shall be galvanized malleable iron or steel, where applicable.

Conduit fittings shall conform in design and quality to the type of conduit on which they are being installed.

Manufacturers are Steel City, Raco, Wheatland or equal.

2. Installation

Use threaded couplings on rigid heavy wall steel raceways.

Use compression style steel connectors on E.M.T. where same is run exposed or concealed above grade.

Use approved style "MC" connectors and fittings in order to maintain adequate case grounding required by the National Electrical Code.

Use bushings, locknuts and expansion fittings of the appropriate type for the raceway system being installed.

E. EXPANSION FITTINGS

Where conduits cross expansion joints in the building, employ the required factory style expansion fittings.

Use type `TX' for thin wall conduits and type `AX' or `EX' for heavy wall conduits.

Provide an external bonding jumper, type `BI' as required by the NEC for exterior applications.

Manufacturers are Raco, O.Z. Gedney, Crouse-Hinds or equal.

F. PULL BOXES, OUTLET BOXES AND COVERS

1. General

For each outlet box, use the proper code size for the entering conduits and the number of wires terminating therein.

Use boxes for convenience outlets, junction boxes, and wall switches sized 4 inch square by 2-1/8 inch deep, wherever this depth is possible.

Use boxes with plaster ring extensions in plastered or dry wall partitions.

For boxes installed in concrete, use a type which allows the placement of conduits entering the box without disturbing the reinforcing rods in the concrete.

Use special forms and design of outlet boxes in such places where space limitations necessitate a special box to secure a workmanlike installation. Use 1-1/2 inch deep boxes only in narrow partitions and other narrow construction.

Use gang boxes for two or three switches at the same location. For more than three devices at one location, use two or more separate boxes because of the difficulty in obtaining special cover plates.

Do not use "through the wall" boxes in shallow construction except as permitted by the local inspector and the Architect/Engineer.

2. Materials

For large pull boxes, use boxes of code gauge sheet steel with steel covers attached with brass screws. Boxes shall be hot dipped, galvanized after fabrication. The minimum size of each box shall be as required by the National Electric Code. Manufacturers are Hoffman, Keystone, Square D, or equal.

For surface mounted pull boxes, use pressed boxes without knockouts, having close fitting, screw attached covers, and finished in a medium gray enamel paint, inside and outside.

For concealed work, use pressed steel boxes, knockout type, zinc coated, of 1/16 inch minimum thickness. Use boxes of form and dimensions best adapted to specific location, kind of fixture used and the number, size and arrangement of raceways connecting thereto. Use Steel City or Raco.

Use sectional type masonry boxes for boxes employed with rigid conduit and located in exposed block or tile walls.

Use standard sectional switch boxes without ears for use with MC Cable or Greenfield, installed in exposed block walls.

Use boxes sized 2 inches by 3 inches by 2-1/2 inches deep, without ears, for receptacles located in exposed brick walls. Mount the box horizontally to occupy one brick course.

For outlet boxes exposed to the weather, use a cast type, NEMA 4, weatherproof, with gasketed covers and threaded hubs for side and top conduit entries.

Use wiremold boxes for surface mounted boxes in finished areas, ivory finish.

3. Material Summary

For flush boxes in metal or wood stud partitions, use Steel City #52171-CV-1/2 and 3/4 or Raco #235 for use with conduit (4"x4"x2-1/8" deep) or Steel City #52171-CV-1/2 and 3/4-XC220 or Raco #235 for use with "MC" (4"x4"x2-1/8" deep).

For flush boxes in narrow metal or wood stud partitions, use Steel City #52151-CV-1/2 and 3/4 or Raco #106 for use with conduit (4"x4"x1-1/2" deep) or Steel City #52151-CVX or Raco #218 for use with "MC" (4"x4"x1-1/2" deep).
For plaster ring extensions for the above device boxes, use Steel City #52C-36 or Raco #770 for 1/4" raise on a 4" square box for 1 device or Steel City #52C-13 for ½" raise on a 4" square box for 1 device or equal by Raco.

For multiple switches or convenience outlets in metal or wood stud partitions, use gangable boxes, such as Steel City #LXWV-LXWLE Series (2"x3"x2-1/2" deep) or equal by Raco.

For boxes in unfinished concrete block walls or tile walls, use Steel City #GW-125C Series or Raco #690 (1-15/16"x3-3/4"x2-1/2" deep) or Steel City #GW-135C Series (1-15/16"x3-3/4"x3-1/2" deep) or Raco #695.

For boxes in unfinished brick walls, use Steel City #CDLE Series (2"x3"x2-1/2" deep) or Raco #501.

For surface boxes on a concrete block wall, use Steel City #52171 - ½ and 3/4 Series or Raco #232 (4"x4"x2-1/8" deep).

For exposed exterior boxes, use Steel City "Perfectline" - Weatherproof Cast Boxes or Raco Bell Boxes.

For ceiling mounted boxes used for fixture attachments, use Steel City #54151 Series or Raco #126 (4" octagon - 1-1/2" deep) or Steel City #54171 Series or Raco #167 (4" octagon - 2-1/8" deep).

4. Installation

Install approved factory made knock-out seals in all boxes where knock-outs are not intact.

Equip each lighting outlet box with a fixture stud supporting device as required by the lighting unit to be installed.

Install partitions in multiple gang sectional boxes when required by Code, similar to Steel City #PGW-25 or #PGW-35 Series.

Provide covers with neoprene gaskets for surface and recessed outlets exposed to the weather.

Locate pull and junction boxes in utility areas or above accessible ceiling systems, wherever possible.

Install flush outlets within 1/4 inch of the finished surface, i.e. so that the cover will be flush with the plaster, drywall or the specified surface material.

Accurately place and securely fasten outlet boxes to structural members. Mount outlet boxes independent of the conduit system.

Firmly anchor bracket and ceiling boxes to the structure when they are required to support lighting fixtures.

Use diamond expansion, cinch or rawl plug anchors for securing surface mounted boxes to stone, brick, block or masonry.

Previous to plaster installation, properly protect all boxes and conduit ends by covering or stuffing to prevent entrance of plaster into the electrical work.

Clean out all boxes before the completion of the wiring and the installation of wiring devices.

Previous to final painting, cover all plates and devices to shield same before being painted.

Label at termination points, pull boxes, junction boxes, etc. with applicable voltage and circuit numbers. Use suitable stick on tags.

G. ANCHOR METHODS

The following anchor methods shall be utilized for each indicated surface:

1. Hollow Masonry: Use toggle bolts or spider type expansion anchors.
2. Solid Masonry: Use lead expansion anchors or preset inserts. Do not use wooden plugs or anchors, lead caulking anchors or plastic anchors.
3. Metal Surfaces: Use machine screws, bolts or welded studs.
4. Wood Surfaces: Use wood screws.
5. Concrete Surfaces: Use self-drilling expansion anchors or powder-driven studs.
6. Structural Steel: Use beam clamps, angle clips welded or powder-driven studs.
7. Exterior: Use anchors, screws, bolts, etc. Devices that are exposed to weather and corrosion shall be rustproof finished or non-ferrous material.

H. CONDUCTORS IN RACEWAYS

1. Materials

Conductors shall be soft drawn copper, minimum 97% conductivity, 600 volt, conforming to ASTM specifications and the latest requirements of the National Electrical Code.

Insulation shall be suitable for the conditions and locations in which conductors are installed. The following shall apply unless otherwise noted or required by location or installation conditions:

1. For building wire in interior above grade locations, use Type THHN/THWN copper rated 75 degrees C. wet or dry.

2. For building wire in exterior locations, installed in conduit/duct and for use in interior wet locations, use type THWN, or XHHW, rated 75 degrees C., wet.

Wires shall be clearly and regularly marked with the wire size, voltage, insulation type and manufacturer's name.

Conductors shall be new and manufactured within eight months previous to delivery at site, with date of manufacture marked on the packages.

Minimum wire size for branch circuiting shall be #12 AWG.

Minimum wire size for line voltage control use shall be #14 AWG.

For 120/208 volt systems, all circuit runs exceeding 75 feet in length extending from the panelboard to the first outlet in the circuit shall be #10 AWG minimum.

Wire #8 AWG and smaller shall be solid; wire #6 AWG and larger shall be stranded.

Wire shall be as manufactured by Hi-Tech, Pirelli, Encore or equal.

2. Installation

Deliver wire to the site in unbroken packages and/or on original reels.

Install wire in conduit in such a manner to provide a maximum insulation resistance between conductors and between conductors and ground as required by the National Electrical Code.

Identify branch circuit wires at outlets. Identify feeders and sub-feeders and mains at all pull and junction boxes. Identification shall be by means of EZ Code wire markers or similar tags.

Install a #14 AWG galvanized steel drag wire in all empty conduit and conduit for use by others.
Do not skin wires to a point closer than 8" to the bushing from which they emerge.

Use high temperature insulation on wires in driver housings of lighting fixtures, in the vicinity of heating equipment and where subject to high ambient temperatures.

Install wire to be continuous between accessible locations at boxes and panels.

Color code all wires as follows:

a. For 120/208 volt systems: Phase A - Black, Phase B - Red, Phase C – Blue, Neutral - White, Equipment Ground - Green.

b. For 3-way and 4-way switch travelers - use Purple or other color not used for phase wires.

Observe all NEC requirements for conductor color coding.

Submit the color codes to be used as part of the conductor section of the shop drawing submittals required.

Provide a typewritten stick-on directory of color coding inside each panelboard door.

Tag the several feeders passing through a common pull box to indicate clearly their electrical characteristics, circuit numbers and panel destination.

Mark the circuit number on each junction or pull box.

The grouping of outlets on individual circuits as shown on the drawings shall be strictly observed.

Grouping of conductors in the conduit shall not be permitted. Incorporate a maximum of five (5) wires, i.e. a maximum of one circuit conductor on each phase A, B, C, plus the neutral wire plus the ground wire in one conduit.

Employ a U.L. listed commercial product such as Wyre-Eze or Yellow-77 for pulling wires into a raceway.

Clean and dry conduits before pulling in wires.

The use of Romex, B.X. or U.F. cable is not permitted.

I. CONDUCTORS NOT IN RACEWAYS

1. Materials

Metal Clad Cable (MC) shall be copper wire with 90 degrees C. THHN insulation, #12 AWG minimum, with continuous insulated green ground conductor and steel armor, manufactured by A.F.C., Alflex, or equal. Use for concealed branch wiring, where required by N.E.C.

2. Installation

Install non-rigid cable in a neat, approved manner, as per N.E.C. requirements. Do not group cables into a common conduit as overheating will result. Do not tie the several cables together.

Use approved style "MC" connectors and fittings in order to maintain adequate case grounding required by the National Electrical Code.

Where groups of metal clad cables extend from surface-mounted panelboards, collector troughs, pull boxes or the like, secure and assemble same in an orderly manner on vertical cable trays or channel ladders. Do not group or bundle together more than four (4) MC cables.

Provide an independent means of support for all wiring located above a drop ceiling assembly from the structural ceiling system. Do not support wiring from the ceiling assembly or from its support wires.

J. SPLICES

Make all splices, joints and taps with solderless pressure connectors listed and approved for the intended use and for the size and number of conductors utilized.

1. For wire #10 AWG and smaller, use twist-on wire nuts.

2. For wire #8 AWG and larger, use heavy duty solderless set screw connectors with a separate barrel for each conductor. Use insulating covers from the manufacturer, where available. Tape properly to provide a sufficient insulation around the entire splice unit, when integral insulating covers are not available from the fitting manufacturer.

Employ 3M brand "Scotchcast" splicing and termination kits for all exterior connections subject to moisture. Where necessary to employ tape, use Scotch Brand #33 by 3M.

Approved manufacturers are Scotch, Buchanan, Ideal, T & B and Burndy.

K. SAFETY SWITCHES

1. Materials

Switch enclosures shall be NEMA 1 for indoor use and NEMA 3R raintight for outdoor use, heavy duty style. Safety switches shall be quick-make, quick-break. The cover shall be interlocked so that it cannot be opened when the switch is in the "on" position, however, voidable interlocks shall be provided in order to bypass this feature when necessary.

Switches shall be horsepower rated, and shall be capable of being locked in the "off" position.

Switches for motor disconnect use shall be non-fused as indicated.

Switches shall be labeled as to their interrupting capacity.

Manufacturer is Siemens to match existing manufacturer.

2. Installation

Mount switches 6'-0" above the finished floor, to the top of the switch.

Secure exterior switches to the equipment which they control or to the nearest wall, using non-corroding anchor bolts or sheet metal screws as required.

L. PANELBOARDS AND CABINETS

1. Materials

Cabinets shall be constructed of code gauge galvanized steel with wiring gutters of sufficient width to provide ample space for branch circuit wires and feeders. Gutters shall conform to NEC standards and shall be over-sized where necessary to accommodate the entrance of several large conduits and/or where necessary to avoid overcrowding of conductors or equipment within. Verify that recessed panelboards will fit in walls where shown on the drawings before ordering the cabinets. Provide hinged door construction.

Interior panel trims shall be flush as noted in the panel schedule and shall contain concealed hinged doors, each equipped with flush chrome plated combination locks and catches, all keyed alike. Finish shall be factory painted white with white screws for interior use. Provide two (2) keys with each panel. All locks shall be keyed alike.

Lugs shall be located at the same end at which the feeder conduit enters.

Panelboards shall be constructed to provide for adjustable alignment of trim and interior panel.

Bus size shall be rated as large as the ampere rating of the protection device supplying the panel.

Busing shall be full capacity, 80% conductivity aluminum, braced for the short circuit current available to the panel and sized as shown in the Panel Detail.

Circuit breakers shall be connected to buses with bolt-on connections for sequence phasing: i.e., circuits 1 and 2 connected to Phase A, 3 and 4 to Phase B and so on. Polarity or block phasing shall not be acceptable.

Panel shall include a neutral bus and an equipment grounding bus. Circuit breakers shall be molded case type, bolt-on, with thermal and magnetic trips, trip-free on overload or short circuit, UL listed, having interrupting capacities which series rate with upstream circuit breakers.

Breaker interrupting capacity shall not be less than the A.I.C. rating of the panel in which it is being installed.

Breaker sizes shall be indicated on handles. Breakers shall have the number of poles and trip sizes shown on drawings. Handles shall indicate a tripped connection.

Spaces for future use shall be ready to receive breakers.

Breakers used for Heating, Air Conditioning, and all other motor loads shall be "HACR" rated.

Breakers shall be labeled "SWD", or "HACR" as required by NEC.

Breakers used for switching purposes shall be the switching duty, "SWD" type on all circuits not employing local wall switches and on circuits which are operated frequently from the panelboard.

All multi-wire branch circuits must have simultaneous disconnecting means at the panelboards. Provide suitable tie handles on applicable circuit breakers to tie together each phase which is part of the multi-wire branch circuit.

2. Installation

Secure each panel cabinet to the vertical metal partitions. Provide cross braces as necessary.

Properly bond enclosure to the conduit system and to the equipment ground bus.

The neutral bus shall be insulated from the cabinet.

Provide indicated lock-on devices to prevent "shut-off" of locally switched circuits. Device shall permit the breaker to trip free on a short circuit. In addition to the indicated lock-ons, furnish spare devices to the Owner before completion of the job as directed. Furnish 24 devices.

Identify all circuits by the use of a typewritten directory card to be located under a plastic cover on the rear of the panel door. Contractor shall provide typewritten directories in all new panelboards.

Circuit labels shall include clear, evident and specific purposes for each circuit including all room names and numbers, in accordance with NEC Section 408.4.

In the panelboard gutters, provide suitable plastic tie wires for each multi-wire branch circuit. Tie wrap the neutral together with the associated phase conductors for each multi-wire branch circuit.

Identify the panel with a plastic nameplate as herein before specified. Fasten this nameplate to the exterior of the cover.

Install a panel at a mounting height of 6'-0" above the finished floor, to the top of the panel.

The Electrical Contractor shall provide and install stick-on warning labels with ½" high letters on all panelboards. Panelboard labels shall be on the inside of the trim's door panel.

Labels shall read:

"WARNING!! POSSIBLE ARC-FAULT HAZARDS EXISTON ENERGIZED EQUIPMENT. SERVICE WORK SHALL BE PERFORMED BY QUALIFIED PERSONNEL ONLY.

Electrical Contractor shall provide a stick-on label on the distribution panel to read:

CAUTION:

SERIES RATED COMBINATION SYSTEM WITH UPSTREAM DEVICES IDENTIFIED REPLACEMENT COMPONENTS REQUIRED.

ALL CIRCUIT BREAKERS SHALL BE MOLDED CASE, RATED (-------★★-------) AMPS IC MINIMUM, AND IN ADDITION SHALL BE SERIES RATED WITH UPSTREAM (MAIN SWITCHBOARD SUBDISTRIBUTION PANEL) CIRCUIT BREAKERS.

★★ FILL IN APPLICABLE VALUES TO MATCH I.C. RATINGS OF PANELBOARD.

Manufacturer is Siemens to match existing manufacturer.

M. WIRING DEVICES AND PLATES

1. Materials

All wiring devices shall be manufactured by one of the manufacturers listed. Do not mix manufacturer's products.

Devices shall be Specification Grade as directed.

2. Wall Switches

Switches shall conform to NEMA Heavy Duty Standards and shall be general use, AC quiet type, 20 ampere, 120/277 volt, back and side wired, color as selected by Architect.

Switch with pilot light shall be the type with a red or clear neon lamp in the handle. Pilot shall indicate that the circuit or the item or light controlled is in operation or is "on".

3. Wall Switch Table

The following entries are acceptable equivalents from each of the listed manufacturers.

20 Amp Single Pole Wall Switch - Hubbell #CS-1221, P & S #CSB-120, Cooper #CSB-120, Bryant #CSB-120, or Leviton #CS-1121.

20 Amp 3-Way Switch - Hubbell #CS-1223, P & S #CSB-320, Cooper #CSB-320, Bryant #CSB-320, or Leviton #CS-1223. .

20 Amp 4-Way Switch - Hubbell #CS-1224, P & S #CSB-420, Cooper #CSB-420, Bryant #CSB-420, or Leviton #CS-1224.

4. Wall Receptacles

All convenience and power receptacles shall conform to NEMA Heavy Duty Standards and shall be the grounding type.

Convenience receptacles shall be 20 ampere, 125 volt, back and side wired, 3 wire grounding, UL listed as complying with the requirements of NEC Article 250-146,and shall be NEMA 5-20R configuration, color as selected by Architect.

Power receptacles shall be the NEMA configuration shown on the drawings complete with a matching molded rubber straight plug cap with cord grips of the maximum size.

Ground fault interrupter receptacles shall be 120 volt, duplex, specification grade commercial devices, rated 20 amp, with feed-thru feature. Device shall be complete with a test switch and reset button which provides visible indication of a ground fault trip.

All receptacles installed in damp or wet locations shall be weather-resistant style.

5. Receptacle Table

The following entries are acceptable equivalent from each of the listed manufacturers.

20 Amp, 125 Volt Duplex Convenience Outlet (NEMA 5-20R) - Hubbell #CR20 Series, or equal by P & S., Cooper, Bryant, or Leviton

20 Amp, 125 Volt, Ground Fault Interrupter (NEMA 5-20R) - Hubbell #GF5352, P & S #2091,Cooper #XGF20, Bryant #GFR53FT, or Leviton #8899. Exterior receptacles shall be weather resistant style.

6. Polarized Outlets

Use polarized outlets of the configuration, amperage and voltage noted on the drawings.

Polarized outlets for 125/250 volt service shall be as manufactured by Hubbell or equal.

7. Plates

Use stainless steel plates throughout.

Use plates of the proper size and configuration to match the wiring device and outlet box being covered.

Use blank plates and telephone plates where required.

Use rounded raised corner screw on cover plates for utility areas. Hooked plates are not acceptable.

8. Installation of Wiring Devices

Unless otherwise indicated, install wiring devices and system components at the following elevations to center line of device as measured from the finished floor:

Wall Switches	3'-6"
Convenience Outlets	2'-0"
Telephone Outlets	2'-0"
"Wall" Telephone Outlets	3'-6"
Polarized Outlets	2'-0"
Television Outlets	2'-0"
Thermostats	3'-6"
Fire Alarm Pull Stations	3'-6"
Fire Alarm Horns/Strobes	80" A.F.F. to Bottom of Unit or 6" below Ceiling to Top of Unit, whichever is lower.

Field change these heights as necessary to meet building conditions. Use heights selected by the Architect/Engineer where the above schedule does not apply.

Install the outlet in such a manner as to properly relate the device to the type of construction in which it is installed.

Observe the required mounting heights for the handicapped in public buildings and housing projects which are federally funded.

Receptacles installed above counter tops shall be located NOT more than 20 inches, maximum, from the top of the receptacle to the counter top surface per N.E.C. Verify the required mounting height with the Architect, prior to rough-in of the box.

N. FASTENINGS AND ATTACHMENTS

For fastenings and attachments, such as screws, bolts and nuts, use devices made of non-ferrous metals or of galvanized or cadmium plated steel. When such devices are not obtainable in non-ferrous metals, or in steel with a protective metallic coating, paint same with a rust preventing paint such as Rustoleum.

Provide independent hangers and supports for all electrical items, conduits, cables, etc. from the building's structural system.

Provide independent hangers and supports for all lighting fixtures in suspended ceilings from the building's structural system.

All fastenings and attachments shall be made of materials or so protected, that they will offer the maximum protection against deterioration from age, weather or dampness.

All exterior fastenings subject to the weather shall be stainless steel.

O. ACCESS PANELS

Provide suitable hinged metallic panels, screw driver latch operated, for obtaining access to concealed electrical items requiring periodic inspection or maintenance.

Panels shall match the construction in which they are installed.

Panels shall be painted to match the surrounding material color by this Electrical Contractor.

P. FIRE STOPS

1. Materials

Putty - Use Flameseal Putty #AA423 as manufactured by Nelson Electric, Tulsa, Oklahoma.
Fiber - Use Ceramic Fiber #AA401 (10 lb. box) or #AA417 (2 lb. bag) as manufactured by Nelson Electric, Tulsa, Oklahoma.

2. Oversized Openings:

Wall - Use Ceramic Board #AA402 (1" x 18" x 12") or #AA403 (1" x 36" x 48") as manufactured by Nelson Electric, Tulsa, Oklahoma.

Floor - Use Support Wire #AA404 as manufactured by Nelson Electric, Tulsa, Oklahoma.

3. Installation

Use total thickness of 1-1/2 inches of Flameseal Putty #AA423 on all penetrations of fire-rated walls and floors. Use Nelson Fiber #AA401 or #AA417 in conjunction with the putty to fill the remaining void of penetrations.

4. Wall Penetrations

Pack ceramic fiber in center of opening leaving 3/4 inch on either side of wall for the putty. Install the putty in the remaining part of opening, working it into all voids and cavities for openings with greater than 4 inches of unsupported space, use Nelson Ceramic Board #AA402 or #AA403 depending on size of opening.

5. Floor Openings

Pack ceramic fiber in bottom of opening per factory recommendations, leaving 1-1/2 inches below floor level for the installation of Flameseal putty. Use Support Wire #AA404 on all penetrations in excess of 6 inches diameter.

END OF SECTION 26 20 02

SECTION 26 24 13

SERVICE AND DISTRIBUTION

A. RELATED DOCUMENTS

Drawings and general provisions of contract, including general and supplementary conditions and Division 1 Specification Sections, apply to work specified in this section.

B. GENERAL INSTALLATION

Use heavy wall GRS conduit for exposed exterior raceways.

Use EMT Electrical Metallic Thinwall conduit for concealed interior raceways.

Use flexible conduit such as "Greenfield" for connections to recessed lighting fixtures in 72" maximum lengths and for use in stud walls where the use of rigid conduit is not practical.

Use weatherproof and oilproof flexible conduit such as "Seal-Tite" for all final connections to motors and vibrating equipment in lengths of 18" maximum.

Use liquid-tight flexible conduit and appropriate liquid-tight fittings in areas exposed to the weather or likely to become damp. Where used, conform to NEC #250-118.

Use Metal Clad Cable (MC) for concealed branch circuit wiring, where required by the N.E.C.

The use of Romex, B.X. and U.F. is not approved.

Provide all arc-fault labeling at panelboards, disconnect switches, and equipment, per NEC and as per the local inspector's requirements.

C. TRANSIENT VOLTAGE SURGE SUPPRESSORS

Transient Voltage Surge Suppressors for branch panelboards shall be Leviton 32120-DY3 (120/208 volt) per the drawings. Each panel shall incorporate single, high energy, solid state semi-conductor T.V.S.S. components per phase. Each phase shall have an LED diagnostic indicator to indicate loss of or damage to the TVSS protection circuit and signal the need for panel replacement. Each panel shall be independently fused and provide threshold type protection. Extend 4#10 THWN + 1#10 GR/GD in a ¾" conduit from a suitable 30 amp, multi-pole breaker in the panel. Where flush-mounted, include a suitable flush-mounting accessory plate. Use #42001-FMC.

Equipment rating shall be: Maximum surge current (8 x 20 uS Waveform): 80 KA (L-N), 50 KA (N-G); U. L. 1449 SVR: 600 v.pk. (120 volt), 1200 v.pk (277 volt).

D. ARC FLASH LABELING

Electrical contractor shall provide arc-flash warning labels on all new switchboards, main distribution panels, main switches, panelboards, and all remote branch disconnect switches.

Install the warning labels on each switchboard, main distribution panel, panelboard/disc switch.

Install applicable short circuit labels on each switchboard, main distribution panel, panelboard/disc switch.

END OF SECTION 26 24 13

SECTION 26 51 01

LIGHTING FIXTURES AND ACCESSORIES

A. RELATED DOCUMENTS

Drawings and general provisions of contract, including general and supplementary conditions and Division 1 Specification Sections, apply to work specified in this section.

B. GENERAL

Provide all lighting fixtures complete. Fixtures shall be as indicated on the Fixture Schedule on the Drawings.

Lighting fixtures that are used in multiple lots, such as in the same room or in the same ceiling area must provide a uniform appearance as far as surface reflectance is concerned. It will be the supplier's responsibility to have his factory screen the units prior to shipment. If it becomes necessary, in the Architect's opinion, to replace said fixtures or lamps to gain this uniformity, the total cost shall be borne by the Electrical Contractor.

C. INSTALLATION

Provide all supplementary structural materials required to properly mount all lighting fixtures.

Securely mount lighting fixtures to structural elements of the building or to suspended ceiling systems such that said fixtures will be square, plumb, and rigid, will not fall or sag, and will not cause the suspended ceiling system to sag. The Electrical Contractor shall pay for the cost of additional labor and materials furnished by himself or by the ceiling system contractor to obtain the foregoing specified conditions to satisfaction of the Architect.

Provide independent hangers and supports for all lighting fixtures in suspended ceilings from the building’s structural system.

Install wiring to and within fixtures to comply with NEC Article #410. Take special care to assure that the fixture outlets for recessed fixtures above solid suspended ceilings will actually be accessible after the project is completed.

Fasten a wall-mounted fixture securely to the outlet box behind it in order to prevent the fixture from being turned or pushed askew.

For fluorescent fixtures which are surface-mounted on the underside of a finished ceiling, install the conduit and outlet box in a concealed manner.

Hang all pendant fixtures to a mounting height as directed by the Architect and Engineer at the site.

Wire indoor fixtures to outlets with Type THHN wire and connect to circuit wires with pressure type connectors such as 3M or Buchanan.

Employ stand-off spacers where surface-mounted fixtures are installed on fibre ceilings. Spacers shall be 1-1/2" in length, as manufactured by Caddy or Ideal.

Provide plaster rings and plaster frames for fixtures recessed in plaster or dry wall.

Provide weatherproof gaskets on exterior fixtures and fixtures located in wet or damp locations.

Provide gaskets for use as light seals where same are required.

Make sure that all fixtures are operating at the time of the final inspection.

D. CONTROLS

Photo-Cells shall be SPST, as applicable, with an adjustable footcandle shutter for "on" control. Capacity shall be 2000 watts at 120 volts. Use Tork #2101 or approved equal manufacturer for 120 volt applications.

Time clocks shall be heavy duty, 7-day type, powered by a self-starting synchronous motor. Switch contacts shall be rated 40 amps per pole continuously at 277 volts (Maximum) and shall be SPST, DPST, 3PST, 4PST as applicable for direct control or SPDT for contactor control. Separate manual on and off levers shall be included. A spring driven reserve unit shall be included to operate the time switch for up to 24 hours after a power failure. Use Tork #W-220L thru #W402L Series.

Time clock for direct control on circuits up to 20 amps at 120 volts only may be the digital style, 7-day variety with single pole-single throw contacts and battery backup. Time clock for contactor control (120 volt coil only) shall be the digital style, 7-day variety with SPDT contacts and battery backup. Use Tork #DGM100 or approved equal manufacturer.

E. COMMISSIONING

1. Contractor shall include in the Bid price all testing and commissioning for the Lighting Control System, occupancy and vacancy sensors, and exterior lighting.

2. E.C. shall hire a separate and independent commissioning firm for this work. All energy code requirements shall be applied.

3. E.C. shall submit written test results for all room areas with approvals. Include 3 paper copies and 1 digital copy.

4. E.C. shall make adjustments and corrections to all controls, as directed by the commissioning company until final and complete approval is approved.

END OF SECTION 26 51 01

SECTION 26 60 01

SPECIAL SYSTEMS

A. RELATED DOCUMENTS

Drawings and general provisions of contract, including general and supplementary conditions and Division 1 Specification Sections, apply to work specified in this section.

B. EMERGENCY UNITS - INDIVIDUAL STYLE

1. General

Provide individual rechargeable style battery sets at the indicated locations.

See the drawings for equipment catalog numbers and accessories which are required.

Units shall provide 90% voltage and operation for 1-1/2 hours minimum.

Verify color options available with the Architect before ordering units.

2. Installation

Provide mounting brackets or a shelf, as required.

Permanently wire each unit to its junction box. Do not use cord and plug sets.

Extend D.C. wiring to remote heads, sized as shown. Connect to D.C. lamps, as required.

Equip all emergency related circuits with lock-on devices to prevent accidental operation by shutting off the circuit breaker.

Test all equipment by simulating a power failure on the circuit to which the emergency unit is connected.

END OF SECTION 26 60 01

SECTION 26 70 01

COMMUNICATIONS

A. RELATED DOCUMENTS

Drawings and general provisions of contract, including general and supplementary conditions and Division 1 Specification Sections, apply to work specified in this section.

B. PUBLIC TELEPHONE SYSTEM

1. General

Provide a limited system of conduit and wiring for use by the Telephone Company, sized as indicated on Plan and Riser on the drawings.

2. Installation

For branch telephone conduits, use a minimum 1 inch trade size.

For flush outlets, use a 4 inch square, 2-1/8" deep box for one device.

In each branch outlet, provide and install an 4 conductor modular telephone jack with integral cover plate.

Where “sleeves only” are indicated between floors, use the type of sleeve which is self-sealing in the event of a fire.

C. FIRE ALARM SYSTEM ADDITIONS

1. General

Furnish, install and place in operating condition, an electronically operated, closed circuit, addressable, fire alarm system, as described herein and shown on the plans. All units of the alarm system shall be listed by U.L. for fire alarm use, and the control panel shall bear the U.L. label. Install the system in accordance with the requirements of the NEC and in compliance with applicable provisions of Standards #72 published by the National Fire Protection Association.

The system shall be complete in every respect including all necessary equipment and accessories shown or not shown on the drawings to perform the functions relative to the system operation.

Existing system is Edwards to match existing.

The local distributors shall be the authorized Manufacturer's Representative and Engineering Contractor.

Manufacturers must submit evidence showing compliance with the above items in order to be considered for approval.

All published specifications of the system manufacturer shall be considered as being a part of this specification, even though they have not been written in complete detail.

The Electrical Contractor shall be responsible for the coordination of a complete system.

The Manufacturer's Representative shall review the drawings (prior to bid) to verify and insure that all local fire alarm requirements have been included. Notify the Engineer immediately if any items are in question.

2. Operation

The activation of any addressable manual station or automatic detection device shall cause the common alarm LED to flash on the Fire Alarm Control Panel and remote annunciator, and shall activate all audible and visible signal devices. The alarm initiating device shall be shown on the Control Panel and remote LCD displays, as specified herein.

Any abnormal condition, such as power failure, open circuit, or a grounded conductor shall cause the system trouble signal to sound and the trouble LED to glow indicating the type of trouble that exists. The trouble signal may be silenced by momentarily depressing the trouble silence switch, but the trouble LED shall glow until the trouble condition has been corrected. If a second trouble condition should arise the trouble signal shall be resounded.

The system shall normally operate from a one phase, (120 VAC 60 Hz) of the Normal Power Supply.

3. Control Panel

Fire Alarm Control Panel is existing.

Submit a battery calculation with the shop drawing submittal.

4. Manual Pull Stations

Furnish and install where shown on the drawings Single Action Manual Stations. Stations shall be constructed of high impact red lexan and shall operate with or without glass rod. Station shall contain a key lock keyed identical to the control panel to be used for resetting the station. Once activated, the pull station handle shall remain at a 90 degree angle from the front of the station to provide visual indication as to which pull station was activated. Manual stations shall be suitable for semi-flush or surface mounting. Where stations are to be surface mounted, the enclosures shall be provided by the manufacturer. Stations shall be semi-flush mounted wherever possible.

5. Addressable Smoke Sensor

Sensors shall be of the photoelectric type and shall communicate actual smoke chamber values to the system control panel. The sensors shall be Listed UL Standard 268 and shall be compatible with the control equipment to which they are connected. The sensors shall be listed for both ceiling and wall mount applications. The sensitivity of each individual detector shall programmable from the control panel. The sensors shall automatically compensate for the accumulation of dust and dirt to maintain operation at their programmed sensitivity level as these contaminates accumulate. The control panel shall identify the need for individual sensors to be cleaned before the contamination effected their sensitivity. In order to assist maintenance personnel, the control panel shall report sensors that are "almost dirty" so that these units can be serviced at the same time as sensors reporting a "dirty" condition. The sensors shall be documented to automatically meet NFPA sensitivity testing requirements.

6. Combination Horn/Flashing Light

Horn shall produce a sound output of 87 decibels. Strobe light shall produce a 110 candela flash. The Strobe Unit shall be U.L. listed to Standard 1971 for ADA compliance. The strobe lights shall incorporate a 1 Hertz flash rate. A compound reflector shall provide light output in Key Axis Directions.

The lens shall be tamper resistant, and the lamp assembly shall also be shock resistant. The lens shall be clear with the word "FIRE" printed in red. The Horn/Strobe Units shall be suitable for semi-flush or surface mounting to a standard 4" square, single-gang, or two-gang electrical outlet box.

7. Addressable Monitor Module (AMM-2)

Use for monitoring of non-addressable devices. An addressable interface module shall be provided for interfacing normally open direct contact devices such as waterflow switches, tamper switches, etc. AMM'S will be capable of mounting in a standard electric outlet box. AMMs shall communicate and be powered by the FCInet's twisted shielded cable.

8. Addressable Output Module (AOM)

Use for non-supervised control of door holder circuits and other control devices not requiring supervised wiring. AOMs will be capable of mounting in a standard electric outlet box. AOMs will include cover plates to allow surface or flush mounting. These AOMs will communicate the supervised wiring status (normal, trouble) to the fire alarm control panel and will receive a command to transfer the relay from the fire alarm control panel.

9. Strobes

Match horn strobes style units, candela ratings as indicated.

10. System Wiring

Furnish and install all wiring, conduit, and outlet boxes required for a complete system as described herein and as indicated on the drawings, all in accordance with the manufacturer's instructions.

Install all wiring to meet the requirements of all national, state and local electrical codes. Size the different wires as specified by the manufacturer. Use a color code for wires throughout and tag all wires at all junction points. Wires shall test free from grounds or crosses between conductors.

All Fire Alarm wiring shall be installed in separate metallic conduits.

The approximate wiring arrangement is shown on the schematic riser diagram for the fire alarm system. The exact wiring arrangement shall be in accordance with the fire alarm equipment manufacturer's requirements.

The equipment manufacturer shall furnish the services of a Factory Trained Technical Representative to supervise the installation of the system. The equipment manufacturer shall furnish installation drawings and technical assistance to the installing contractor. Make the final connections between equipment and the wiring system under the direct supervision of the manufacturer's representative.

11. System Test and Guarantee

The manufacturer's authorized representative shall perform a complete functional test of the system and shall make a quality inspection of the final installation, in the presence of the Electrical Contractor and the Owner's Representative. A system certification verifying the proper system operation is required prior to final acceptance by the Architect/Owner.

Guarantee all equipment and wiring to be free from inherent mechanical and electrical defects for a period of one year from the date of final acceptance. See previous sections in these specifications and Architectural Divisions for additional items on guarantee.

END OF SECTION 26 70 01

SECTION 26 80 01

MOTOR WIRING

A. RELATED DOCUMENTS

Drawings and general provisions of contract, including general and supplementary conditions and Division 1 Specification Sections, apply to work specified in this section.

B. WIRING FOR HVAC AND PLUMBING CONTRACTS

1. General

Work included in this Section covers the wiring to and final connections of all electrical equipment for the related Heating, Ventilating, Air Conditioning and Plumbing Contracts, as furnished and installed by others as well as miscellaneous equipment to be furnished and/or installed by the Electrical Contractor as noted.

Note that all Heating, Ventilating, Air Conditioning and Plumbing equipment and starters for the same are furnished by others.

2. Installation

Verify all locations with the various Mechanical Contractors before installing raceways.

Provide all wiring materials and devices required to connect and operate the electrical parts of equipment furnished and installed under the Mechanical Division.

Install and connect all starters, pushbuttons, switches, thermostats, and other control devices as furnished by others, unless otherwise noted.

Install feeder and branch circuit connections to all motors and motorized equipment including disconnects and mounting of controllers.

Provide manual motor starters for fractional horsepower motors without built-in thermal overload protection.

Provide a disconnect switch of the proper size for each motor as required by Code, whether indicated or not.

Make all final connections to motorized equipment. Verify the correct direction of rotation.

Connect motor circuits to the rigid conduit system by means of weatherproof style flexible conduit, properly grounded and bonded. Employ a green ground wire for all systems and motor frame ground connections. Bolt the wire to the motor frame at one end and to the motor starter at the other end with approved terminal devices.

Do all wiring necessary to operate supply and exhaust fans, damper motors, pumps and unit heaters.

Mount all control devices such as thermostats, switches, motor sentinels, pilot lights and miscellaneous devices and connect as required or directed.

Wire to and connect all system pumps and controls.

Install, wire to and connect electric baseboard heaters and other electrical heating equipment.

Install, wire to and connect all loose electric control equipment which is furnished by others. Receive this equipment at the curb and transport same to the point of installation.

Do all line voltage control wiring (120 volt and higher).

All low voltage control wiring (under 120 volts) is the responsibility of the HVAC or Plumbing Contractors.

Obtain the control diagram from the respective contractor for each trade involved.

END OF SECTION 26 80 01

Halsey Taylor

SPECIFICATIONS

Halsey Taylor HydroBoost Bottle Filling Station & Bi-Level Integral OVL-II Fountain Non-Filtered Non-Refrigerated Stainless

Model HTHB-OVLSEBP-I

PRODUCT SPECIFICATIONS

Halsey Taylor HydroBoost® Bottle Filling Station & Bi-Level Integral OVL-II™ Fountain Non-Filtered Non-Refrigerated Stainless. Features shall include Antimicrobial, Green Counter™, Laminar Flow, Real Drain, Sanitary Sensor Activated. Furnished with Double Bubbler ™. Electronic Bottle Filler Sensor with Mechanical Front Bubbler Button activation. Product shall be Wall Mount (Inwall Frame/Plate), for Indoor applications, serving 2 station(s). Unit shall be certified to UL 399 and CAN/CSA C22.2 No. 120. Unit shall be lead-free design which is certified to NSF/ANSI 61 & 372 (lead free) and meets Federal and State low-lead requirements.

Special Features:	Antimicrobial, Green Counter™, Laminar Flow, Real Drain, Sanitary Sensor Activated
Finish:	Stainless Steel
Power:	115V/60Hz
Bubbler Style:	Double Bubbler ™
Activation by:	Electronic Bottle Filler Sensor with Mechanical Front Bubbler Button
Mounting Type:	Wall Mount (Inwall Frame/Plate)
Chilling Capacity:	Non-refrigerated
Full Load Amps	1
Rated Watts:	15
Dimensions (L x W x H):	38-1/2" x 19" x 34-5/8"
Approx. Shipping Weight:	118 lbs.
Installation Location:	Indoor
No. of Stations Served:	2

- Mechanically-Activated bubbler continues to supply water in event of service disruptions.
- Touchless, sensor-activation, designed for easy use.
- Green Counter: Informs user of number of 20 oz. plastic water bottles saved from waste.
- Laminar flow provides clean fill with minimal splash.
- Silver Ion Antimicrobial protection on key plastic components to inhibit the growth of mold and mildew.
- Real Drain System eliminates standing water.
- Exclusive Double Bubbler which projects two separate streams that converge to form a fuller, more satisfying drink.

Included with Product: **Fountain with Integral Bottle Filling Station (OVLSEBPWSI-NF), Mounting Frame (MFWS220)**

▼ Ships in multiple boxes.

AMERICAN PRIDE. A LIFETIME TRADITION.
Like your family, the Elkay family has values and traditions that endure. For almost a century, Elkay has been a family-owned and operated company, providing thousands of jobs that support our families and communities.

PRODUCT COMPLIANCE

ADA & ICC A117.1
ASME A112.19.3/CSA B45.4
Buy American Act
CAN/CSA C22.2 No. 120
GreenSpec®
NSF/ANSI 61 & 372 (lead free)
UL 399

Complies with ADA & ICC A117.1 accessibility requirements when installed according to the requirements outlined in these standards. Installation may require additional components and/or construction features to be fully compliant. Consult the local Authority Having Jurisdiction if necessary.

Installation Instructions (PDF) - 0000001032
Installation Instructions (PDF) - 0000000755

Electrical components and water system are warranted for 12 months from date of installation. **Warranty pertains to drinking water applications only. Non-drinking water applications are not covered under warranty.**

Warranty (PDF)

PART:_____QTY: _____
PROJECT:_____
CONTACT:_____
DATE:_____
NOTES:_____
APPROVAL:_____

In keeping with our policy of continuing product improvement, Halsey Taylor reserves the right to change product specifications without notice. Please visit Halseytaylor.com for the most current version of Halsey Taylor product specification sheets. This specification describes a Halsey Taylor product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

Optional Accessories		
HWF3000	Halsey Taylor WaterSentry Plus Filter Kit (Bottle Fillers) Spec Sheet (PDF)	
HTOVLAPR	Halsey Taylor Cane Apron for OVL-II Models (Gray) Spec Sheet (PDF)	
ACCESS12X38-5	Accessory - Stainless Steel Access Panel for Bi-Level Architectural Fountains Spec Sheet (PDF)	

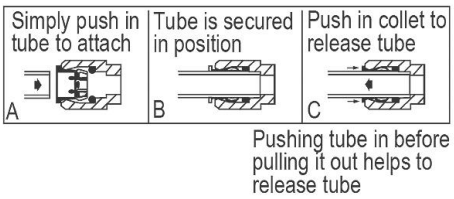
Halsey Taylor HydroBoost Bottle Filling Station & Bi-Level Integral OVL-II Fountain Non-Filtered Non-Refrigerated Stainless
Model HTHB-OVLSEBP-I

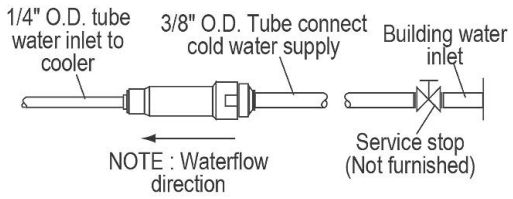
IMPORTANT!
INSTALLER PLEASE NOTE:

The grounding of electrical equipment such as telephone, computers, etc., to water lines is a common procedure. This grounding may be in the building or may occur away from the building. This grounding can cause electrical feedback into a water cooler, creating an electrolysis which causes a metallic taste or causes an increase in the metal content of the water. This condition is avoidable by using the proper materials as indicated below. The drain fittings which are provided by the installer should also be plastic to electrically isolate the cooler from the building plumbing system.

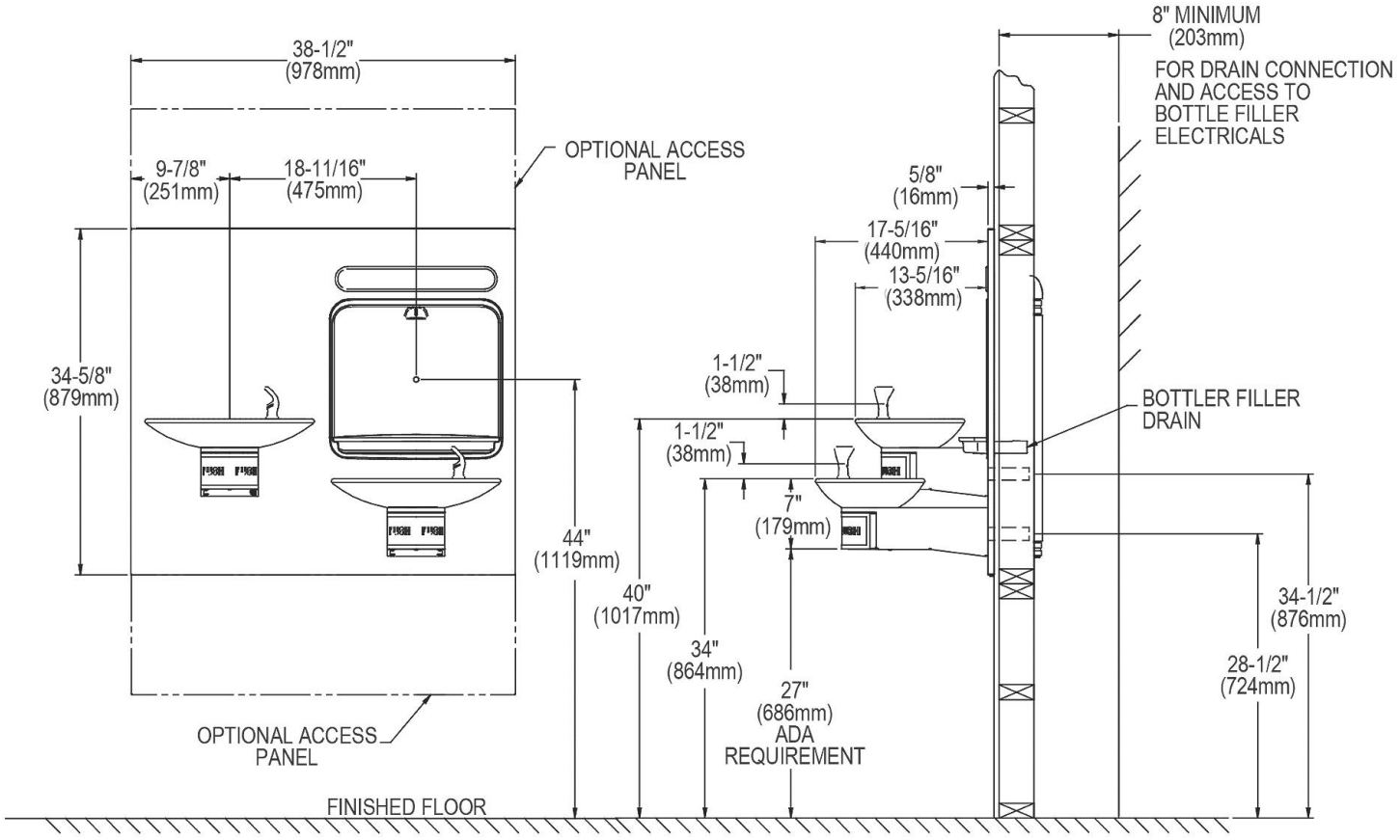
Simultaneous operation of both bubblers on a bi-level unit may not be possible depending on water supply pressure. If simultaneous operation is desired, please ensure a minimum of 65 psi supply. Lower pressure may be possible for non-filtered and/or non-refrigerated installations.

OPERATION OF QUICK CONNECT FITTINGS





BOTTLE FILLER SPECIFICATIONS



NOTE : New Installations Must Use Ground Fault Circuit Interrupter (GFCI).

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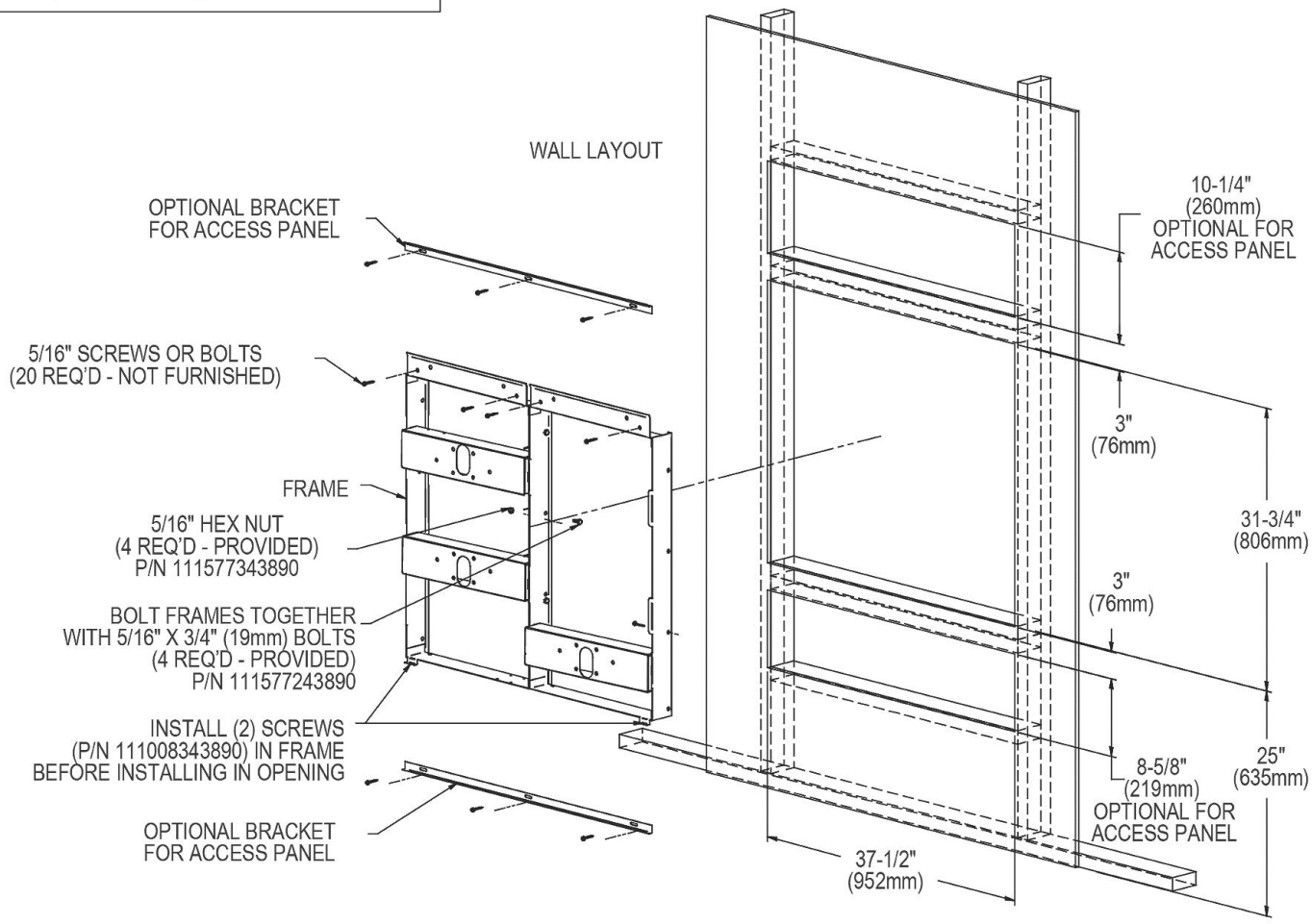
Halsey Taylor HydroBoost Bottle Filling Station & Bi-Level Integral OVL-II Fountain Non-Filtered Non-Refrigerated Stainless
Model HTHB-OVLSEBP-I

WALL OPENING
IMPORTANT: It is necessary to create a wall opening 37-1/2" W x 31-3/4" H and 25" above the floor line.
ELECTRICAL DATA
Electical outlet, three (3) conductor grounded. Locate withing safe reach of power cord.

MOUNTING INSTRUCTIONS
Refer to rough-in for location of plumbing and electrical sources. The support frame is to be installed first. Hang upper panel to hanger on frame. Fountains are to be attached to panel and wall frame. Water service lines, waste lines and electrical are assembled as required. Perform a final check for leaks and correct functions of fountains and chiller. (For details see the installation instructions.)
Installation requires trap to be installed in wall. Trap and service stop not included.

MOUNTING FRAME MFWS220

INSTALLER NOTE
This drinking fountain is furnished with a bubbler and valve including all connecting fittings which are manufactured of completely lead free material. Shut off valve (not furnished) to accept 3/8" O.D. unplated copper tube.



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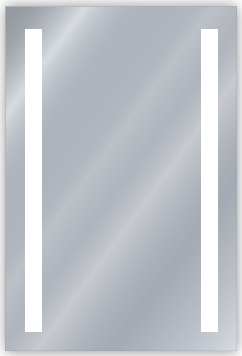
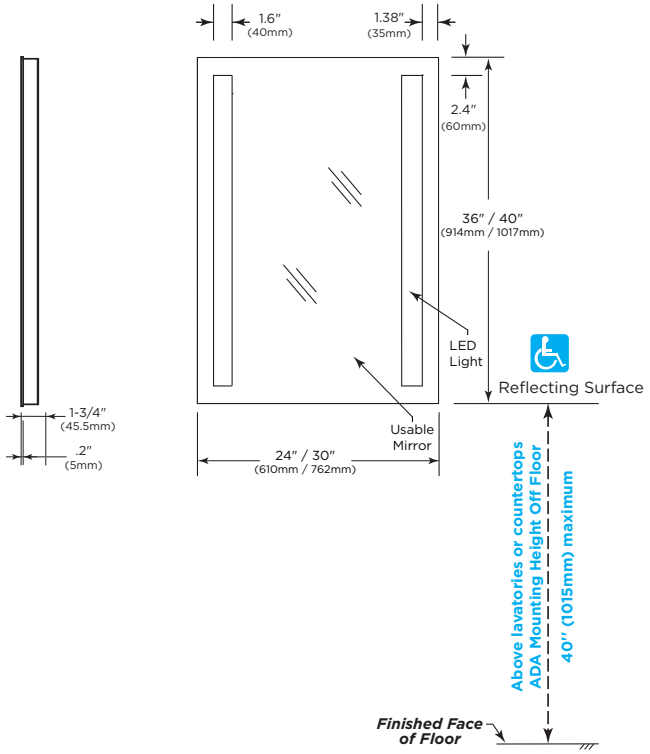
BOBRICK

Technical Data

LED SIDELIT MIRROR

B-169





STANDARD B-169 MIRRORS

OVERALL SIZE			
MODEL NO.	**W**	**H**	**Lumens**
B-169 2436	24" (610mm)	36" (914mm)	1,250
B-169 2448	26" (660mm)	49-3/4" (1264mm)	1,510
B-169 3040	30" (762mm)	40" (1016mm)	1,450

ADA Installation Guidance

Maximum mounting height above lavatories and countertops:

ADA: 40" (1015mm) above finished floor (AFF)

*For more information regarding operable parts, please refer to Bobrick Planning Guide for Accessible Restrooms, page 9.

Designer's Notes:

1. Mirrors are manufactured to a ±0.04" (1mm).
2. For sufficient space to lift mirror onto key hole slots allow 1".
3. ADA requires mirrors located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 40" (1015mm) maximum above the finish floor or ground. Mirrors not located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 35" (890mm) above the finish face of floor.
4. A single full length mirror can accommodate a greater number of people, including children. In order for mirrors to be usable by people who are ambulatory and people who use wheelchairs, the top edge of the mirror should be 74" (1880mm) minimum from the finish face of floor.

MATERIALS:

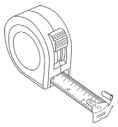
Glass — 0.19" (5mm) thick safety mirror with 0.14mm PVC film backer with frosted sandblasting.

Extruded Back — Aluminum channel with mounting holes.

Optional 6V AC Adapter with U.S. Plug — Available. Order Part No. 164-57.

TOOLS NEEDED (Customer Supplied):

Toggle Bolts (optional)



Tape Measure

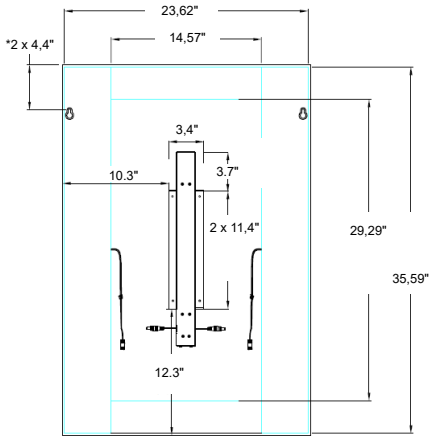
Electric Drill

continued . . .

Revised 4/4/23

Safety Instructions:

- Disconnect power before installing, adding or changing any component.
- To avoid a hazard to children, account for all parts and destroy all packing materials.
- Do not install any luminaire assembly closer than 6″ from any combustible materials.
- This power supply must be installed according to the National Electrical Code and local building codes.



INSTALLATION:

Mark the location of the wire exit and mounting holes. See individual product specifications for mounting hole locations. Install a duplex receptacle (not provided).

The mirror has an optional 30″ cord with three-prong plug (order 164-57), so the outlet should be installed a few inches away from the wire exit. Locating it too close to the wire exit may interfere with the power supply housing and prevent the mirror from being plugged in properly.

Install mounting screws into pre-marked holes. It is highly recommended that all mirrors be installed in contractor supplied blocking, however, drywall anchors may be used if no blocking is available.

For added safety, Bobrick recommends the 55-1/8″ x 25-5/8″ (1400 x 650mm) or larger edge lit mirror only be installed in blocking. If blocking is not available, drywall toggle bolts (not provided) should be used.

IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

Read all instructions before using this mirror.

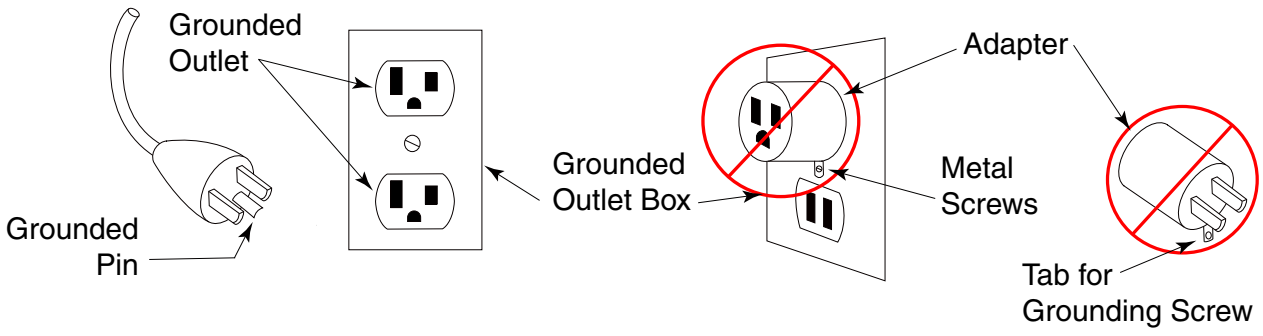
DANGER - To reduce the risk of electric shock; Always unplug this mirror from the electrical outlet before cleaning.

WARNING - To reduce the risk of burns, fire, electric shock, or injury to persons:

- Unplug from outlet before putting on or taking off parts.
- Close supervision is necessary when this mirror is used by, or near children, invalids, or disabled persons.
- Use this mirror only for its intended use as described in these instructions.
- Never operate this mirror if it has a damaged cord or plug, if it is not working properly, if it has been dropped or damaged, or dropped into water.
- Keep the cord away from heated surfaces.
- Never drop or insert any object into any opening.
- Do not use outdoors.
- WARNING: Risk of electric shock - Connect this mirror to a properly grounded outlet only. See grounding instructions.

GROUNDING INSTRUCTIONS

This mirror is for use on a nominal 120V circuit and has an optional three prong grounding plug that looks like the plug illustrated in sketch below. Make sure that the mirror is connected to an outlet having the same configuration as the plug, No adapter should be used with this mirror.



SPECIFICATION:

Mirrors shall have a 1mm thick anodized AL6061 frame. Integral UL recognized power supply must have 24V output and 110 – 277V input along with 0-10V dimming option. Reflective surface shall be 0.6″ (1.5mm) thick and covered with a 0.14mm PVC film backer with frosted sandblasting. Lead free silver backing shall exceed ISO 9227:2012 and exceed 120-hour corrosion testing. Aluminum mounting panel shall contain key hole slots both top and bottom to provide easy installation and prevent the mirror from pulling away from the wall.

LED Sidelit Mirror shall be Model B-169 _____ (insert width and height) of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

POWERFOIL® BREEZE

Keep workers motivated and customers comfortable even in the largest spaces with Powerfoil Breeze. Featuring the power of our flagship industrial HVLS fans and an alluring aesthetic to complement any space, Powerfoil Breeze makes facility-wide comfort and year-round energy savings possible without sacrificing on style.

KEY FEATURES

- **Six anodized airfoils** with winglets and safety system
- **Sleek, contemporary design** delivers large-scale airflow
- **Permanent-magnet motor** for silent, efficient operation
- **IP66-rated protection** against dust, water, and vapors
- **Indoor or covered outdoor use** to suit numerous applications
- **Available options** include occupancy sensor, BAFCon controller, and custom colors

DIAMETER

16–24 FEET
(4.9–7.3 METERS)

MOTOR

NEODYMIUM MAGNET DIRECT-DRIVE

MOUNTING

I-BEAMS, BAR JOISTS, SOLID BEAMS, AND PURLINS

WARRANTY

UP TO **10 YEARS** MECHANICAL

UP TO **10 YEARS** ELECTRICAL

BIG ASS FANS®

EXCEPTIONALLY ENGINEERED

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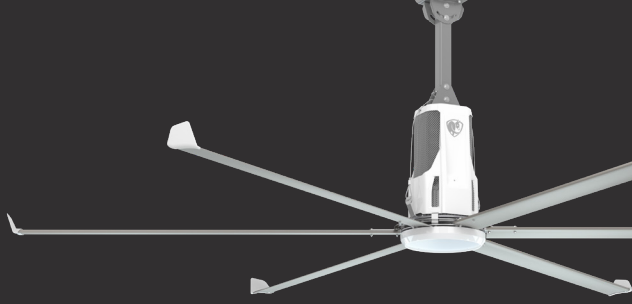
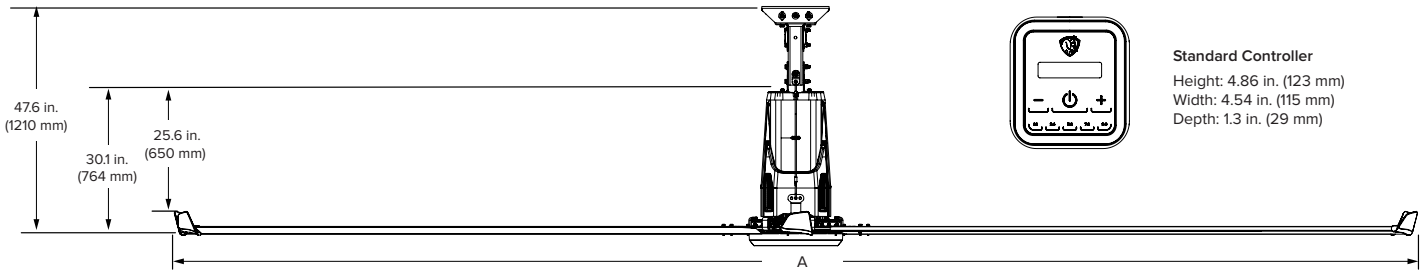
TECHNICAL SPECIFICATIONS

POWERFOIL® BREEZE

A SILENT WORKHORSE DESIGNED TO MATCH YOUR STYLE





Pictured with 1 ft (305 mm) extension tube

Standard Controller
Height: 4.86 in. (123 mm)
Width: 4.54 in. (115 mm)
Depth: 1.3 in. (29 mm)

Technical Specifications

Diameter (A)	Weight[1]	Max Speed	Input Power and Required Breaker	Airfoil Clearances[2]	Max Operating Temperature
16 ft (4.9 m)	246 lb (112 kg)	81 RPM	200–277 VAC, 50/60 Hz, 1 Φ, 15 A 200–277 VAC, 50/60 Hz, 3 Φ, 15 A 380–480 VAC, 50/60 Hz, 3 Φ, 10 A	2 ft (0.6 m) on sides 6 ft (1.8 m) below ceiling	131°F (55°C)
18 ft (5.5 m)	254 lb (115 kg)	74 RPM			
20 ft (6.1 m)	261 lb (118 kg)	64 RPM		2 ft (0.6 m) on sides 7 ft (2.1 m) below ceiling	
24 ft (7.3 m)	276 lb (125 kg)	48 RPM			

Construction Features

Airfoils	Motor and Drive	Certifications	Mounting	Multi-Point Safety[3]	Colors
Six patented anodized Powerfoil airfoils Stylized winglets eliminate wind noise	Neodymium magnet motor provides virtually silent operation Custom-designed enclosure made from durable ABS with steel mesh for maximum heat dissipation Rated IP66	UL Standard 507 and CSA Standard 22.2 No. 113	Standard upper mount installs to I-beams and bar joists Optional kits allow for mounting to solid beams and purlins	Double safety cable system, airfoil retainers, hub safety clips, Grade 8 clear zinc hardware, fire relay, guy wires, and airfoil restraint system	Standard colors are silver with black or white with silver. Individualize your fan with one of our classic color upgrades, or work with our design consultants to create a shade that's all your own.

Controls

Standard Controller	Integrations	BAFCon Upgrade[4]
Made from durable UV-resistant materials Rated IP55 Intuitive touchscreen interface On/Off and variable speed control Password protection Powered by fan drive	Building automation systems (Modbus-RTU and BACnet protocol) 0–10 V control Fire suppression systems	Integrated SmartSense technology automatically adjusts fan speed based on seasonal conditions 24-bit color LCD display with resistive touchscreen protected in sleek metal and ABS housing Powered by fan drive

Standard Controller

White with silver

Silver with black

[1] Weight does not include mount or extension tube.
[2] Measure the distance from the tip of the winglet to the ceiling or major obstruction.
[3] Airfoil restraint system comes standard on 20–24 ft (6–7.3 m) fans and is an option for smaller diameter fans. The fire relay must be wired during install if required by local code. Guy wires are included with fans that have extension tubes 4 ft (1.2 m) or longer.
[4] Optional upgrade available; ships separately.

Lead times may vary.
See full warranty for coverage information.

BIG ASS FANS

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POWERFOIL D®

We've raised the bar on direct-drive technology with our quietest, most efficient industrial fan ever. The groundbreaking Powerfoil D delivers airflow that radically changes the way people feel and work within your space. Rated IP66 for maximum protection in demanding environments, it takes on hot, gritty conditions with ease and has the specs to excel in any facility where comfort and quiet are valued.

KEY FEATURES

- **Six aluminum airfoils** with winglets and safety restraints
- **Built-in accelerometer**, safety cables, and Grade 8 hardware
- **Building automation integration** with 0–10 VDC, Modbus, and BACnet capability
- **Permanent-magnet motor** and VFD reduce noise, EMI, and energy usage
- **IP66-rated protection** against dust, water, and vapors for indoor or outdoor use
- **Available LED** offers ultra-bright, fully dimmable lighting

DIAMETER

8–24 FEET
(2.4–7.3 METERS)

MOTOR

NEODYMIUM MAGNET DIRECT-DRIVE

MOUNTING

I-BEAMS, BAR JOISTS, SOLID BEAMS, AND PURLINS

WARRANTY

UP TO **15 YEARS** MECHANICAL

UP TO **15 YEARS** ELECTRICAL

BIG ASS FANS®

EXCEPTIONALLY ENGINEERED

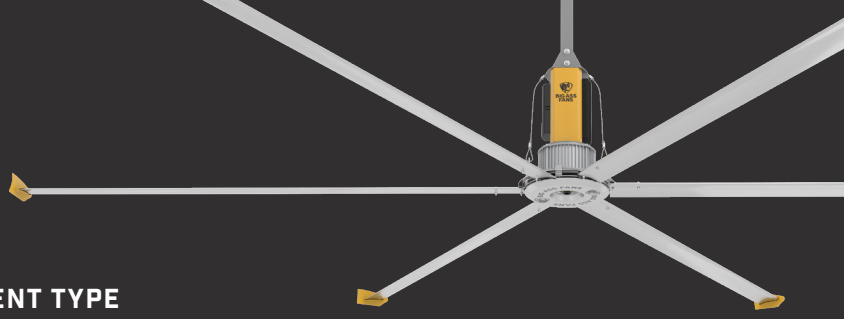
DISCOVER MORE ABOUT POWERFOIL D

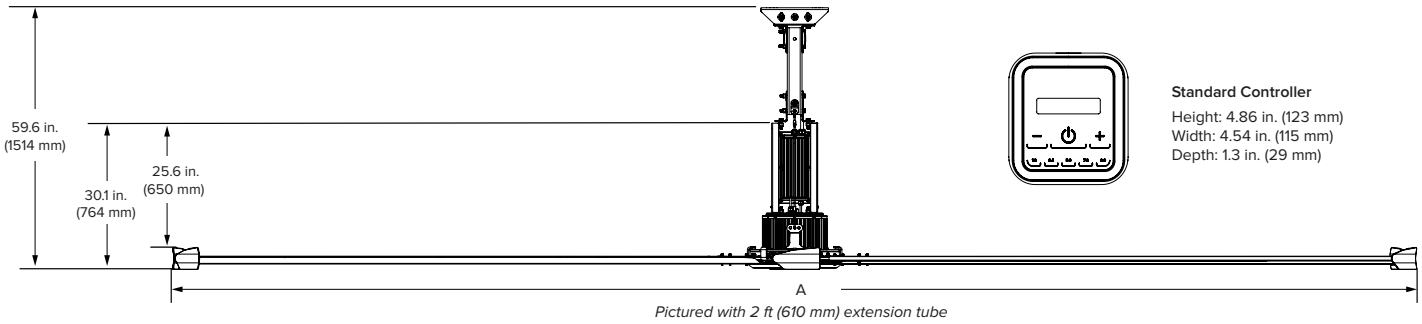
Learn more at **bigassfans.com/powerfoil-d**
or call **877.BIG.FANS** for a free custom quote.

TECHNICAL SPECIFICATIONS

POWERFOIL D®

THE INDUSTRIAL FAN THAT'S THE STRONG, SILENT TYPE





Pictured with 2 ft (610 mm) extension tube

Standard Controller
Height: 4.86 in. (123 mm)
Width: 4.54 in. (115 mm)
Depth: 1.3 in. (29 mm)

Technical Specifications

Diameter (A)	Weight[1]	Max Speed	Input Power and Required Breaker	Airfoil Clearances[2]	Max Operating Temperature
8 ft (2.4 m)	212 lb (96 kg)	200 RPM	200–277 VAC, 50/60 Hz, 1 Φ, 10 A 200–277 VAC, 50/60 Hz, 3 Φ, 10 A 380–480 VAC, 50/60 Hz, 3 Φ, 10 A	2 ft (0.6 m) on sides 4 ft (1.2 m) below ceiling	131°F (55°C)
10 ft (3 m)	220 lb (100 kg)	145 RPM			
12 ft (3.6 m)	227 lb (103 kg)	145 RPM	200–277 VAC, 50/60 Hz, 1 Φ, 10 A 200–277 VAC, 50/60 Hz, 3 Φ, 10 A 380–480 VAC, 50/60 Hz, 3 Φ, 10 A	2 ft (0.6 m) on sides 5 ft (1.5 m) below ceiling	
14 ft (4.3 m)	235 lb (107 kg)	120 RPM			
16 ft (4.9 m)	242 lb (110 kg)	108 RPM	200–277 VAC, 50/60 Hz, 1 Φ, 15 A 200–277 VAC, 50/60 Hz, 3 Φ, 15 A 380–480 VAC, 50/60 Hz, 3 Φ, 10 A	2 ft (0.6 m) on sides 6 ft (1.8 m) below ceiling	
18 ft (5.5 m)	273 lb (124 kg)	94 RPM	200–277 VAC, 50/60 Hz, 1 Φ, 15 A 200–277 VAC, 50/60 Hz, 3 Φ, 15 A 380–480 VAC, 50/60 Hz, 3 Φ, 10 A		
20 ft (6.1 m)	280 lb (127 kg)	84 RPM		2 ft (0.6 m) on sides 7 ft (2.1 m) below ceiling	
24 ft (7.3 m)	295 lb (134 kg)	64 RPM			

Construction Features

Airfoils	Motor and Drive	Certifications	Mounting	Multi-Point Safety[3]	Colors
Six patented Powerfoil airfoils (mill finish) Powerfoil winglets eliminate wind noise (BAF yellow)	Neodymium magnet motor provides virtually silent operation and optimum efficiency Rated IP66	UL Standard 507 and CSA Standard 22.2 No. 113	Standard upper mount installs to I-beams and bar joists Extension tubes available in 2, 5, or 10 ft (0.6, 1.5, or 3 m) lengths Optional kits allow for mounting to solid beams and purlins	Double safety cable system, airfoil retainers, hub safety clips, Grade 8 hardware, fire relay, guy wires, and airfoil restraint system	Standard colors are silver and yellow. Individualize your fan with one of our classic color upgrades, or work with our design consultants to create a shade that's all your own.

Controls

Standard Controller	Integrations	BAFCon Upgrade[4]
Made from durable UV-resistant materials Rated IP55 Intuitive touchscreen interface On/Off and variable speed control Password protection Powered by fan drive	Building automation systems (Modbus-RTU protocol) 0–10 V control Fire suppression systems	Integrated SmartSense technology automatically adjusts fan speed based on seasonal conditions 24-bit color LCD display with resistive touchscreen protected in sleek metal and ABS housing Powered by fan drive

Standard Controller

[1] Weight does not include mount or extension tube.
[2] Measure the distance from the tip of the winglet to the ceiling or major obstruction.
[3] Airfoil restraint system comes standard on 20–24 ft (6–7.3 m) fans and is an option for smaller diameter fans. The fire relay must be wired during install if required by local code. Guy wires are included with fans that have extension tubes 4 ft (1.2 m) or longer.
[4] Optional upgrade available; ships separately.

Lead times may vary.
See full warranty for coverage information.

BIG ASS FANS®

USA
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877-244-3267

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844-924-4277

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BIGASSFANS.COM/AU
1300 244 277

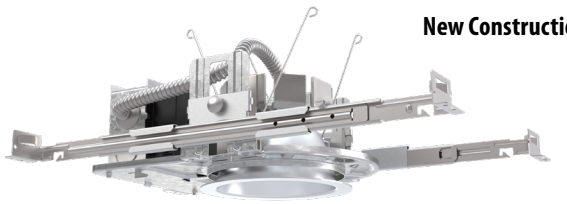
SINGAPORE
BIGASSFANS.COM/SG
65 6709 8500

LITHONIA LIGHTING®

Catalog Number	
Notes	
Type	

LDN4 SWITCHABLE

4" Open and Wallwash LED
IC and Non-IC
New Construction Downlight



Open Trim

Wallwash Trim

FEATURES & SPECIFICATIONS

INTENDED USE — Typical applications include corridors, lobbies, conference rooms and private offices.

CONSTRUCTION — Galvanized steel mounting/plaster frame; galvanized steel junction box with bottom-hinged access covers and spring latches. Reflectors are retained by torsion springs. Vertically adjustable mounting brackets with commercial bar hangers provide 3-3/4" total adjustment. Two combination ½"-3/4" and four ½" knockouts for straight-through conduit runs. Capacity: 8 (4 in, 4 out). No. 12 AWG conductors, rated for 90°C.

Accommodates 12"-24" joist spacing.

Passive cooling thermal management for 25°C standard. Light engine and drivers are accessible from above or below ceiling.

Ceiling thickness range 1/2" to 1-1/2".

OPTICS — 55° cutoff to source and source image

LEDs are binned to a 3-step MacAdam Ellipse

80 CRI standard. 90 CRI optional.

A+ CAPABLE LUMINAIRE — This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning when used with Acuity Brands controls products. All configurations of this luminaire are calibrated and tested to meet the Acuity Brands' specifications for chromatic consistency – including color rendering, color fidelity and color temperature tolerance around standard CIE chromaticity coordinates. To learn more about A+ standards, specifications, and testing visit www.acuitybrands.com/aplus.

UGR — UGR is zero for fixtures aimed at nadir with a cut-off equal to or less than 60 degree per CIE 117-1996 Discomfort Glare in Interior Lighting. UGR FAQs

ELECTRICAL — Adjustable lumen output with four module options.
MVOLT 120/277V 50/60Hz driver (0-10V & 120V Phase Dimming to 10% or 1% min dimming level). DALI driver dimming to 1% also available

FCC CFR Title 47 Part 15 Class A for 277V. FCC CFR Title 47 Part 15 Class B for 120V.

Lumen Maintenance

L80 @ 60,000 hours

LISTINGS — Certified to US and Canadian safety standards. Wet location, requires covered ceiling. Title 24 compliant (90CRI, up to 1000lm). Wallwash suitable for damp locations only. Some configurations are Energy Star certified, please visit www.energystar.gov for specific products. Drivers are ROHS compliant.

WARRANTY — 5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

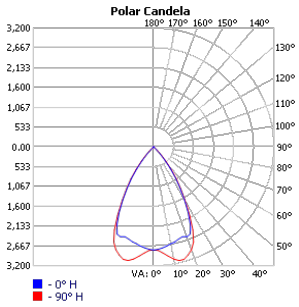
Note: Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25 °C.
Specifications subject to change without notice.

PERFORMANCE DATA

LDN4 AR LS		80CRI							
Lumen Output	Wattage	30K/80CRI		35K/80CRI		40K/80CRI		50K/80CRI	
		Delivered Lumens	LPW	Delivered Lumens	LPW	Delivered Lumens	LPW	Delivered Lumens	LPW
ALO1 (500LM)	6	570	99	584	101	597	102	616	105
ALO1 (750LM)	9	903	102	924	103	946	105	975	108
ALO1 (1000LM)	13	1268	98	1297	100	1328	102	1369	104
ALO2 (1000LM)	13	1344	108	1375	110	1408	112	1451	115
ALO2 (1500LM)	19	1961	105	2007	106	2055	108	2118	111
ALO2 (2000LM)	25	2471	99	2528	101	2588	103	2668	105
ALO3 (2000LM)	25	2542	103	2601	104	2663	106	2745	109
ALO3 (2500LM)	32	3069	98	3140	99	3214	101	3314	103
ALO3 (3000LM)	38	3485	93	3566	94	3651	96	3764	98
ALO4 (4000LM)	39	4094	106	4178	108	4262	110	4303	111
ALO4 (4500LM)	44	4519	103	4611	105	4703	107	4750	108
ALO4 (5000LM)	49	4914	100	5015	102	5115	104	5165	105

- Tested in accordance with IESNA LM-79-08.
- Tested to current IES and NEMA standards under stabilized laboratory conditions.
- CRI: 80 typical

DISTRIBUTIONS



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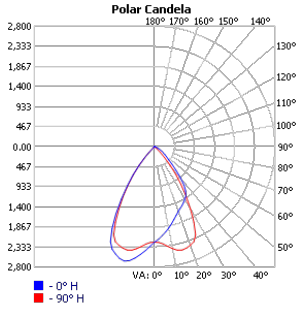
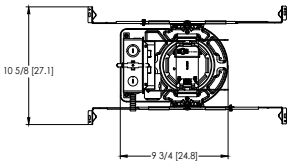
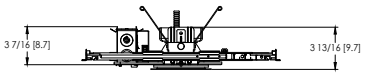


Wallwash

DIMENSIONS

LDN4 500-2000 Lumens





Aperture: Ø 4-5/16" [11]
Ceiling Cutout: Ø 5-1/8" [13] Self-flanged
Overlap Trim: Ø 5-7/16" [13.8]
Ceiling Cutout: Ø 5-1/4" [13.3] Flangeless

See page 5 for other fixture dimensions.

LDN4 SWW

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: LDN4 AL02 SWW1 LO4 AR LSS MVOLT UGZ

LDN4								
Series	**Lumens ‡**	**Color Temperature ‡**	**Trim Style**	**Trim Color**	**Flange Color ‡**	**Trim Finish**	**Distribution**	**Voltage**
LDN4 4" Round	**Adjustable Lumen Output** AL01 500/750/1000lm AL02 1000/1500/2000lm AL03 2000/2500/3000lm AL04 4000/4500/5000lm **Fixed Lumen Output** 05LM 500lm 07LM 750lm 10LM 1000lm 15LM 1500lm 20LM 2000lm 25LM 2500lm 30LM 3000lm 40LM 4000lm 45LM 4500lm 50LM 5000lm	**Switchable CCT** SWW1 3000K-3500K-4000K-5000K **Fixed Switchable CCT** 27K 2700K 30K 3000K 35K 3500K 40K 4000K 50K 5000K	LO4 Downlight LW4 Wallwash	AR Clear WR ‡ White painted BR ‡ Black painted TRALTBD ‡ RAL paint trim TCPC ‡ Custom paint trim	(blank) Self-flange TRW White TRBL Black FRALTBD RAL paint flange only FCPC Custom paint flange only	LSS Semi-specular LD Matte diffused LS Specular	(blank) Medium Wide (1.0s/mh) WD Wide (1.2s/mh)	MVOLT 120V - 277V 347 347V step-down transformer supplied

Driver		**Emergency ‡**		**Control Input ‡**		**Options**	
UGZ	Universal dimming to 10% 0-10V; line voltage dimming (120V)	Blank	No emergency option	Blank	No control option	90CRI	High CRI (90+)
UGZ1	Universal dimming to 1% 0-10V; line voltage dimming (120V)	EL	Batterypack (10W constant power) Non-T20 Compliant, integral test switch	NPS80EZ	nLight® network power/relay pack with 0-10V dimming	AT ‡	Airtight (IP55)
DALI ‡	DALI dimming to 1%	ELR	Batterypack (10W constant power) Non-T20 Compliant, remote test switch	NPS80EZER	nLight® network power/relay pack with 0-10V dimming; ER controls fixtures on emergency circuit.	CP ‡	Chicago Plenum
D10	Minimum dimming 10% driver for use with JOT D1 Minimum dimming 1% driver for use with JOT	E10WCP	Batterypack (10W constant power) T20 Compliant, integral test switch	NLTAIR2	nLight® Air enabled		
D1	Minimum dimming 1% driver for use with JOT	E10WCPR	Batterypack (10W constant power) T20 Compliant, remote test switch	NLTAIRER2	nLight® AIR Dimming Pack Wireless Controls. Controls fixtures on emergency circuit		
		E10WRSTAR	Emergency battery pack, 10W with remote test switch and Iota STAR technology	NLTAIREM2	nLight® AIR Dimming Pack Wireless Controls. UL924 Emergency Operation, via power interrupt detection.		
		ETS	Iota Emergency Transfer System	JOT	Wireless room control with "Just One Touch" pairing		

‡ Option Restrictions

Options	**Restriction** ***Lumens and Color Temp restriction note:*** *Fixed Lumens and CCT must be specified together (for example: 10LM 30K).*
AT	Standard for CP and IP55, not availabe with WW
E10WCPR	Not available EC1, EC6, QDS, CP, 347V, NPS80EZ ER, NLTAIRER2, NLTAIREM2, or ALO3 (2000-3000L) DALI.
E10WCP	Not available with EC1, EC6, AT, QDS, CP, 347V, NPS80EZ ER, NLTAIRER2, NLTAIREM2, ALO3 (2000-3000L) DALI, OR WL.
E10WRSTAR	Not available with wet location, EC1, EC6, QDS, CP, 347V, NPS80EZ ER, NLTAIRER2, NLTAIREM2, ALO3 & ALO4 w/DALI, OR 2000-4500 lumens w/JOT. Top access installation or 17.5" plenum clearance required for roomside installation. Not available with integral test switch.
ELR	Not available EC1, EC6, QDS, CP, 347V, NPS80EZ ER, NLTAIRER2, NLTAIREM2, or ALO3 (2000-3000L) DALI.
EC6	Not Available with CP,QDS, ELR, E10WCP, or E10WCPR.
WL	Not available with WW, All CP is wet location, except WW (Damp). IP55 rated.
QDS	Not Available with CP, ELR, E10WCP, or E10WCPR.
EC1	Not Available with CP,QDS, ELR, E10WCP, or E10WCPR.
JOT	Not availabe with CP, NPS80EZ, NPS80EZ ER, NLTAIR2, NLTAIRER2, NLTAIREM2, UGZ, or DALI drivers. Max 4500 lumens. Fixed lumens and CCT only.
NPS80EZ	Not available with CP, QDS, DALI, D1, OR D10 drivers. 120V OR 277V only. Not available with 347V.
NPS80EZER	Not available with CP, QDS, ELR, E10WCP, E10WCPR, DALI, D1, OR D10 drivers. 120V OR 277V only. Not available with 347V.
NLTAIR2	Not available with CP, QDS, DALI, D1, OR D10 drivers. Non-emergency luminaires with this option can be used as a normal power sensing device for nLight AIR devices and luminaires with EM emergency options.
NLTAIRER2	Not available with CP, QDS, ELR, E10WCP, E10WCPR, DALI, D1, OR D10 drivers. Not available with 347V.
NLTAIREM2	Not available with CP, QDS, ELR, E10WCP, E10WCPR, DALI, D1, OR D10 drivers. See UL 924 Sequence of Operation table.
CP	Not available with, QDS, EC1, EC6, ELR, E10WCP, E10WCPR, 347V, JOT, NPS80EZ, NPS80EZ ER, NLTAIR2, NLTAIRER2, NLTAIREM2, D1, OR D10 drivers. Not availabe with square trim.
ETS	Not available with, QDS, ELR, E10WCP, E10WCPR, 347V, JOT, NPS80EZ, NPS80EZ ER, NLTAIR2, NLTAIRER2, NLTAIREM2, DALI, D1, OR D10 driver
DALI	Not available with fixed lumens or CCT. Max 4500 lumens.
WW	Not available with WL, EL, E10WCP.
TRW, TRBL	Available with clear (AR) reflector only.
WR, BR	Not available with a reflector finish
347V	Not available with CP, QDS, EL, ELR, E10WCP, E10WCPR, NLTAIRER2, ETS, NPS80EZ, NPS80EZER, ALO1 ROUND TRIM, 05 LUMENS ROUND TRIM, AND 07 ROUND TRIM.
TRALTBD, FRALTBD	RALTBD for pricing only. Replace with applicable RAL number and finish when ready to order. See the RAL BROCHURE for available color options.
TCPC, FCPC	CPC options for pricing only. Custom color chip needs to be sent in to your Customer Resolution specialist before order can be processed. Click HERE for more details

Accessories: *Order as a separate catalog number.*	
LO4 AR ** TRIM	4" clear, specular reflector (** specify finish LS, LSS, or LS)
LO4 WR TRIM	4" white reflector
LO4 BR TRIM	4" black reflector
LW4 AR ** TRIM	4" wallwash clear, specular reflector (** specify finish LS, LSS, or LS)
LW4 WR TRIM	4" wallwash white reflector
LW4 BR TRIM	4" wallwash black reflector
GRA4 6 JZ	Oversized trim ring with 6" outside diameter
SCA4	Sloped Ceiling Adapter. Degree of slope must be specified (5D, 10D, 15D, 20D, 25D, 30D). Ex: SCA6 10D.

EMERGENCY BATTERY PACK OPTIONS - FIELD INSTALLABLE

Battery Model Number	Wattage	Runtime (Minutes)	Lumen Output* @ 120 Lumens/Watt	Other
ILB CP07 2H A	7W	120	840	Storm Shelter / 2 Hour Runtime
ILB CP10 A	10W	90	1200	
ILBLP CP10 HE SD A+	10W	90	1200	Title 20, Self Diagnostic
ILBLP CP15 HE SD A+	15W	90	1800	Title 20, Self Diagnostic
ILB CP20 HE A	20W	90	2400	Title 20
ILB CP20 HE SD A	20W	90	2400	Title 20, Self Diagnostic
ILBHI CP10 HE SD A+	10W	90	1200	347-480V AC Input, Title 20, Self Diagnostic
ILBHI CP15 HE SD A+	15W	90	1800	347-480V AC Input, Title 20, Self Diagnostic

All the above are UL Listed products that are certified for field install external/remote to the fixture.

* Minimum delivered lumen output to assist in product selection for increased fixture mounting height.

+ The CP10 delivered emergency illumination outperforms legacy 1400 lumen fluorescent emergency ballast.

Please contact us at techsupport@iotaengineering.com for any Emergency Battery related questions.

LDN4 SWW

PHOTOMETRY

LDN4 AR LS		90CRI							
Lumen Output	Wattage	30K/90CRI		35K/90CRI		40K/90CRI		50K/90CRI	
		Delivered Lumens	LPW	Delivered Lumens	LPW	Delivered Lumens	LPW	Delivered Lumens	LPW
AL01 (500LM)	6	498	87	512	88	526	90	539	92
AL01 (750LM)	9	789	89	810	91	832	92	853	94
AL01 (1000LM)	13	1108	86	1138	88	1168	89	1198	91
AL02 (1000LM)	13	1174	95	1206	97	1238	99	1270	100
AL02 (1500LM)	19	1714	91	1761	93	1807	95	1854	97
AL02 (2000LM)	25	2159	87	2218	89	2276	91	2335	92
AL03 (2000LM)	25	2222	90	2282	92	2342	94	2402	95
AL03 (2500LM)	32	2682	85	2755	87	2827	89	2900	91
AL03 (3000LM)	38	3046	81	3129	83	3211	85	3294	86
AL04 (4000LM)	39	3398	88	3468	90	3537	91	3572	92
AL04 (4500LM)	44	3751	85	3827	87	3904	89	3942	90
AL04 (5000LM)	49	4079	83	4162	84	4245	86	4287	87

LDN4WW AR LS		80CRI							
Lumen Output	Wattage	30K/80CRI		35K/80CRI		40K/80CRI		50K/80CRI	
		Delivered Lumens	LPW	Delivered Lumens	LPW	Delivered Lumens	LPW	Delivered Lumens	LPW
AL01 (500LM)	6	561	97	574	99	587	101	606	103
AL01 (750LM)	9	888	100	908	101	930	103	959	106
AL01 (1000LM)	13	1246	97	1275	98	1305	100	1346	102
AL02 (1000LM)	13	1321	106	1352	108	1384	110	1427	113
AL02 (1500LM)	19	1928	103	1973	105	2020	106	2083	109
AL02 (2000LM)	25	2429	98	2485	99	2544	101	2623	104
AL03 (2000LM)	25	2499	101	2557	103	2618	105	2699	107
AL03 (2500LM)	32	3017	96	3087	98	3160	99	3258	102
AL03 (3000LM)	38	3426	91	3506	93	3589	95	3700	97
AL04 (4000LM)	39	4031	104	4113	106	4195	108	4236	109
AL04 (4500LM)	44	4449	101	4539	103	4630	105	4676	107
AL04 (5000LM)	49	4838	98	4937	100	5035	102	5085	103

LDN4WW AR LS		90CRI							
Lumen Output	Wattage	30K/90CRI		35K/90CRI		40K/90CRI		50K/90CRI	
		Delivered Lumens	LPW	Delivered Lumens	LPW	Delivered Lumens	LPW	Delivered Lumens	LPW
AL01 (500LM)	6	490	85	503	87	517	89	530	90
AL01 (750LM)	9	776	87	797	89	818	91	839	93
AL01 (1000LM)	13	1089	84	1119	86	1148	88	1178	90
AL02 (1000LM)	13	1155	93	1186	95	1217	97	1248	99
AL02 (1500LM)	19	1685	90	1731	92	1777	94	1822	95
AL02 (2000LM)	25	2123	85	2180	87	2238	89	2295	91
AL03 (2000LM)	25	2184	88	2243	90	2302	92	2362	94
AL03 (2500LM)	32	2637	84	2708	86	2780	87	2851	89
AL03 (3000LM)	38	2994	80	3076	81	3157	83	3238	85
AL04 (4000LM)	39	3346	86	3414	88	3482	90	3516	91
AL04 (4500LM)	44	3692	84	3768	86	3843	88	3881	88
AL04 (5000LM)	49	4015	81	4097	83	4179	85	4220	86

LUMEN OUTPUT MULTIPLIERS - FINISH	
Specular (LS)	1.05
Semi-specular (LSS)	1.00
Matte diffuse (LD)	0.85

LUMEN OUTPUT MULTIPLIERS - CCT			
3000K	3500K	4000K	5000K
0.98	1.0	1.01	1.03

LUMEN OUTPUT MULTIPLIERS - CRI	
80	1.0
90	0.874

HOW TO ESTIMATE DELIVERED LUMENS IN EMERGENCY MODE

Use the formula below to estimate the delivered lumens in emergency mode

Delivered Lumens = 1.25 x P x LPW

P = Ouput power of emergency driver. P = 10W for PS1055CP

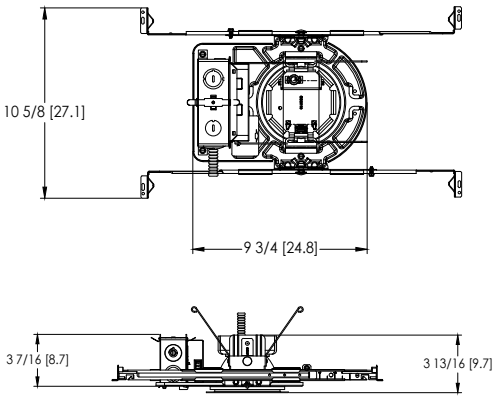
LPW = Lumen per watt rating of the luminaire. This information is available on the ABL luminaire spec sheet.
The LPW rating is also available at Designlight Consortium.

LDN4 SWW

* All dimensions are inches (centimeters) unless otherwise noted.

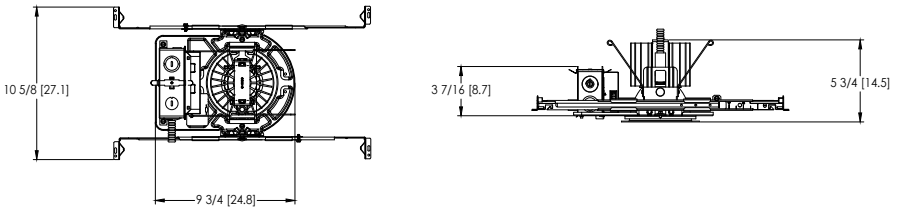
LDN4 SWW1 IC RATING	
AL01	IC
AL02	NON-IC
AL03	NON-IC

LDN4 SWW1 500-2000 Lumens



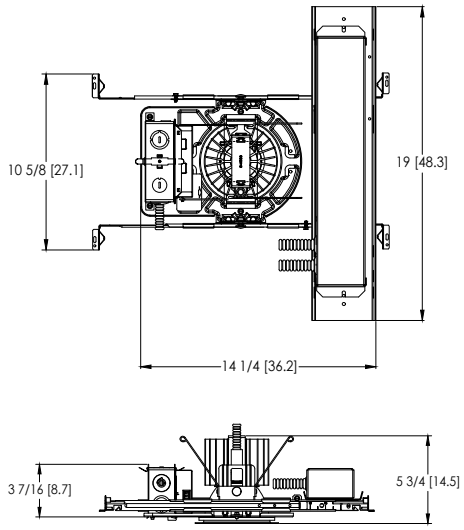
Aperture: Ø 4-5/16" [11]
Ceiling Cutout: Ø 5-1/8" [13] Self-flanged
Overlap Trim: Ø 5-7/16" [13.8]
Ceiling Cutout: Ø 5-1/4" [13.3] Flangeless

LDN4 SWW1 CP 2000-4000 Lumens



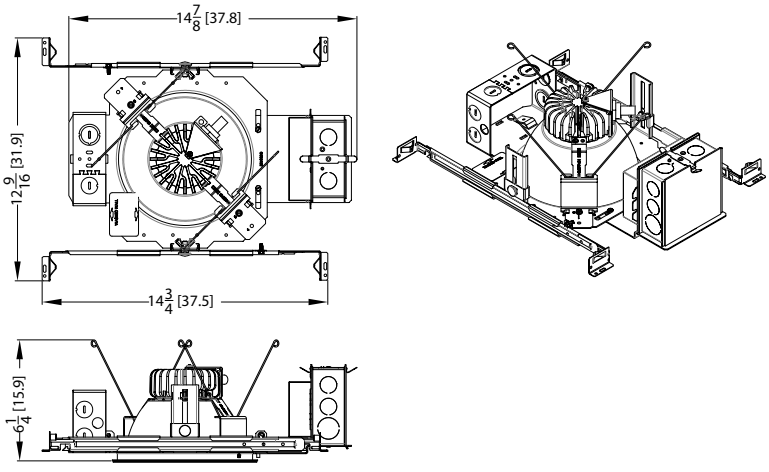
Aperture: Ø 4-5/16" [11]
Ceiling Cutout: Ø 5-1/8" [13] Self-flanged
Overlap Trim: Ø 5-7/16" [13.8]
Ceiling Cutout: Ø 5-1/4" [13.3] Flangeless

LDN4 SWW1 EL



Aperture: Ø 4-5/16" [11]
Ceiling Cutout: Ø 5-1/8" [13] Self-flanged
Overlap Trim: Ø 5-7/16" [13.8]
Ceiling Cutout: Ø 5-1/4" [13.3] Flangeless

LDN4 SWW1 CP 500-3000LM



DIMMER COMPATIBILITY

Not compatible with DALI or DMX dimmers. For specific compatible dimmers see below.

COMPATIBLE LINE VOLTAGE DIMMERS:						
Type	Forward Phase	ALO1 (500-1000lm)	ALO2 (1000-2000lm)	ALO3 (2000-3000lm)	ALO4 (3000-5000lm)	Comment
MLV	Sensorswitch WPD	YES	YES	YES	YES	
MLV	Sensorswitch CMR PDT10 ADC VLP	YES	YES	YES	YES	
MLV	Synergy ISD 600LV	YES, 2x *	YES	YES	YES	* min 2 fixtures
INC	Synergy ISD 600 I	YES, 2x *	YES	YES	YES	* min 2 fixtures
MLV	Lutron Glyder GLV-600	YES	YES	YES	YES	
INC	Leviton SureSlide 6633	YES	YES	YES	YES	
MLV	Lutron Diva DVLV-600P	YES	YES	YES	YES	
MLV	Lutron Skylark SLV-600P	YES	YES	YES	YES	
INC	Lutron RadioRA 2 10ND	YES	YES	YES	YES	
MLV	Leviton SureSlide 6613-PLW	YES	YES	YES	YES	
INC	Lutron Diva DVCL-153P	YES	YES	YES	YES	
MLV	Leviton IPM06	YES, 2x *	YES	YES	YES	* min 2 fixtures

Type	Reverse Phase Dimmer Bank	ALO1 (500-1000lm)	ALO2 (1000-2000lm)	ALO3 (2000-3000lm)	ALO4 (3000-5000lm)	
ELV	Lutron Nova T NTELV-600	YES	YES	YES	YES	
ELV	Lutron Diva DVELV 600P	YES	YES	YES	YES	
ELV	Lutron Maestro MAELV 600	YES	YES	YES	YES	
ELV	Leviton Vizia VPE06-1LX	YES	YES	YES	YES	
ELV	Leviton Illumatech IPE04	YES	YES	YES	YES	
ELV	Control4 C4-APD 120 REVERSE PHASE	YES	YES	YES	YES	

Type	Miscellaneous Dimmers	ALO1 (500-1000lm)	ALO2 (1000-2000lm)	ALO3 (2000-3000lm)	ALO4 (3000-5000lm)	
PHA	Lutron RadioRA2 RRD-6NA	YES	YES	YES	YES	
PHA	Lutron Maestro PRO LED+ RRD-PRO	YES	YES	YES	YES	

Type	Control Systems	ALO1 (500-1000lm)	ALO2 (1000-2000lm)	ALO3 (2000-3000lm)	ALO4 (3000-5000lm)	
MLV	Lutron LP-RPM-4U	YES	YES	YES	YES	
PHA	Lutron LP-RPM-4A	YES	YES	YES	YES	
MLV	Lutron GRAPHIC EYE QSGRJ-3P	YES	YES	YES	YES	
PHA	Lutron PA Power Module PHPM-PA-120	YES	YES	YES	YES	
ELV	Lutron nLight nSP5PCD ELV	YES	YES	YES	YES	

COMPATIBLE 0-10V DIMMERS:							
Manufacturer	System Type	Description	P/N	ALO1 (500-1000lm)	ALO2 (1000-2000lm)	ALO3 (2000-3000lm)	ALO4 (3000-5000lm)
ACUITY	Wall Box	sensorswitch, dimming switch with multi-way option	SPODMRA	YES	YES	YES	YES
ACUITY	Wall Box	sensorswitch, wall switch sensor, occupancy controlled dimming	WSX D WH	YES	YES	YES	YES
ACUITY	Control System	nLight	nPP16D	YES	YES	YES	YES
ACUITY	Control System	nLight	nPS 80 EZ	YES	YES	YES	YES
ACUITY	Control System	nLight Air	rPP20 D	YES	YES	YES	YES
Lutron	Other	0-10V (sink or source) PowPak wireless dimming module	RMJ-5T-DV-B	YES	YES	YES	YES
Wattstopper	Control System	Digital single relay room controller (0-10V)	LMRC-211	YES	YES	YES	YES
Crestron	Control System	DIN Rail 0-10V fluorescent dimmer, 4 feeds, 4 channels (Green Light System)	DIN-4DIMFLV4	YES	YES	YES	YES
Lutron	Other	Grafik Eye 0-10V adapter	GRX-TVI	YES	YES	YES	YES
Leviton	Wall Box	Illumatech 0-10V	IP710-DLX	YES	YES	YES	YES
Lutron	Control System	Mounted in the Homeworks QS panel - 0-10V dimmer (sink or source)	GRX-TVM2	YES	YES	YES	YES
Lutron	Wall Box	Nova 0-10V wallbox dimmer (use with PP-120-H line voltage relay)	NTFTV	YES	YES	YES	YES
Lutron	Wall Box	Nova 0-10V wallbox dimmer (use with PP-120-H line voltage relay)	NTSTV-DV	YES	YES	YES	YES
Lutron	Wall Box	Nova T	NFTV	YES	YES	YES	YES
Leviton	Wall Box	Renior II 0-10V	AWSMG-7DW	YES	YES	YES	YES

ADDITIONAL DATA

JOT
JUST ONE TOUCH

The Sensor Switch JOT enabled solution offers a wireless, app-free approach to single room lighting control. JOT enabled products use Bluetooth® Low Energy (BLE) technology to enable wireless dimming and switching.

Diagram

LDN4 Series

Sensor Switch
WSXA JOT

1. **Power:** Install JOT enabled fixtures and controls as instructed.
2. **Pair:** Insert the pairing tool into the pinhole on the wall switch; press and hold any button for 6 seconds.
3. **Play:** Once paired, each fixture will individually dim down to 10% brightness. All products will be fully functional.

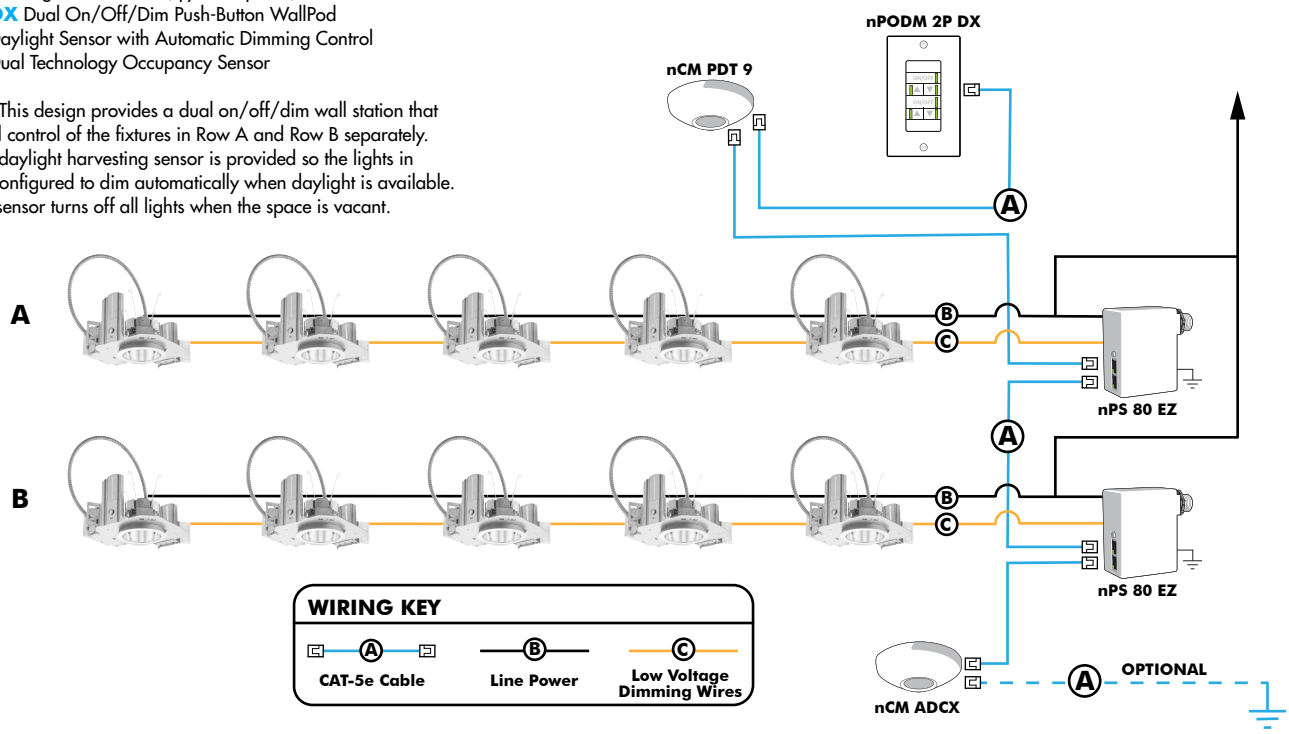
COMPATIBLE 0-10V WALL-MOUNT DIMMERS		
MANUFACTURER	PART NO.	POWER BOOSTER AVAILABLE
Lutron®	Diva® DVTV	
	Diva® DVSCTV	
	Nova T® NTFTV	
	Nova® NFTV	
Leviton®	AWSMT-7DW	CN100
	AWSMG-7DW	PE300
	AMRMG-7DW	
	Leviton Centura Fluorescent Control System	
	IllumaTech® IP7 Series	
Synergy®	ISD BC	RDMFC
	SLD LPCS	
	Digital Equinox (DEQ BC)	
Douglas Lighting Controls	WPC-5721	
Entertainment Technology	Tap Glide TG600FAM120 (120V)	
	Tap Glide Heatsink TGH1500FAM120 (120V)	
	Oasis 0A2000FAMU	
Honeywell	EL7315A1019	EL7305A1010 (optional)
	EL7315A1009	
HUNT Dimming	Preset slide: PS-010-IV and PS-010-WH	
	Preset slide: PS-010-3W-IV and PS-010-3W-WH	
	Preset slide, controls FD-010: PS-IFC-010-IV and PS-IFC-010-WH-120/277V	
	Preset slide, controls FD-010: PS-IFC-010-3W-IV and PS-IFC-010-3W-WH-120/277V	
	Remote mounted unit: FD-010	
Lehigh Electronic Products	Solitaire	PBX
PDM Electrical Products	WPC-5721	
Starfield Controls	TR61 with DALI interface port	RT03 DALInet Router
WattStopper®	LS-4 used with LCD-101 and LCD-103	

LDN4 SWW

EXAMPLE
Group Fixture Control*
*Appiication diagram applies for fixtures with eldoLED drivers only.

nPS 80 EZ Dimming/Control Pack (qty: 2 required)
nPODM 2P DX Dual On/Off/Dim Push-Button WallPod
nCM ADCX Daylight Sensor with Automatic Dimming Control
nCM PDT 9 Dual Technology Occupancy Sensor

Description: This design provides a dual on/off/dim wall station that enables manual control of the fixtures in Row A and Row B separately. Additionally, a daylight harvesting sensor is provided so the lights in Row B can be configured to dim automatically when daylight is available. An occupancy sensor turns off all lights when the space is vacant.



Choose Wall Controls

nLight offers multiple styles of wall controls - each with varying features and user experience.

Push-Button Wallpod
Traditional tactile buttons and LED user feedback

Graphic Wallpod
Full color touch screen provides a sophisticated look and feel

nLight® Wired Controls Accessories:			
Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlight for complete listing of nLight controls.			
WallPod Stations	**Model number**	**Occupancy sensors**	**Model Number**
On/Off	nPODM (Color)	Small motion 360°, ceiling (PIR/dual Tech)	nCM 9 / nCM PDT 9
On/Off & Raise/Lower	nPOD DX (Color)	Large motion 360°, ceiling (PIR/dual tech)	nCM 10 / nCM PDT 10
Graphic Touchscreen	nPOD GFX (Color)	Wide View (PIR/dual tech)	nWV 16 / nWV PDT 16
Photocell controls	**Model Number**	Wall Switch w/ Raise/Lower (PIR/dual tech)	nWSX LV DX / nWSX PDT LV DX
Dimming	nCM ADCX	**Cat-5 cables (plenum rated)**	**Model Number**
		10', CAT5 10FT	CAT5 10FT J1
		15, CAT5 15FT	CAT5 15FT J1

nLight® AIR Control Accessories:
Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlightair.

Wall switches	Model number
On/Off single pole	rPODB [color]
On/Off two pole	rPODB 2P [color]
On/Off & raise/lower single pole	rPODB DX [color]
On/Off & raise/lower two pole	rPODB 2P DX [color]
On/Off & raise/lower single pole	rPODBZ DX WH[1]

Notes

1 Can only be ordered with the RES7Z zone control sensor version.

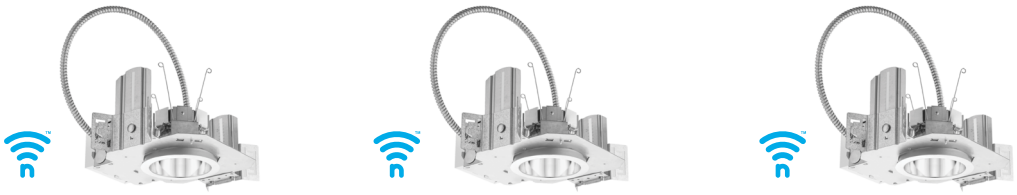
UL924 Sequence of Operation

The below information applies to all nLight AIR devices with an EM option.

- EM devices will remain at their high-end trim and ignore wireless lighting control commands, unless a normal-power-sensed (NPS) broadcast is received at least every 8 seconds.
- Using the CL**AIR**ITY+ mobile app, EM devices must be associated with a group that includes a normal power sensing device to receive NPS broadcasts.
- Only non-emergency rPP20, rLSXR, rSBOR, rSDGR, and nLight AIR luminaires with version 3.4 or later firmware can provide normal power sensing for EM devices. See specification sheets for control devices and luminaires for more information on options that support normal power sensing.

nLight AIR

nLight AIR is the ideal solution for retrofit or new construction spaces where adding communication is cost prohibitive. The integrated nLight AIR rPP20 Power Pack is part of each Lithonia LDN Luminaire. These individually addressable controls offer the ultimate in flexibility during initial setup and for space repurposing.



Simple as 1,2,3

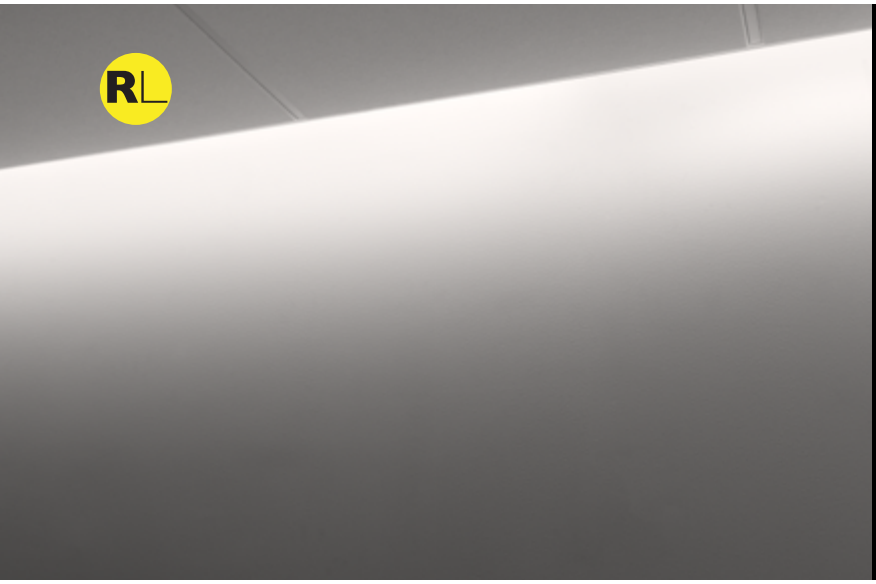
1. Install the nLight® AIR fixtures with embedded smart sensor
2. Install the wireless battery-powered wall switch
3. With CL**AIR**ITY app, pair the fixtures with the wall switch and if desired, customize the sensor settings for the desired outcome

nLight AIR rPODB 2P DX Mobile Device

Focus™ Wall Wash

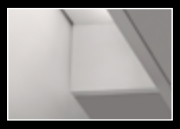
LED

FOCAL POINT®



inside corner

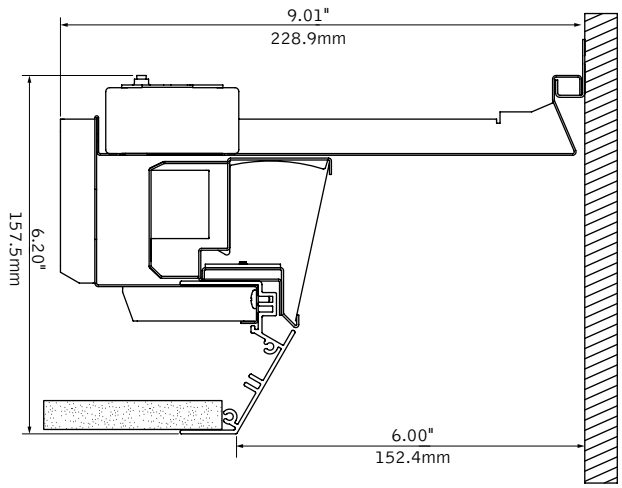
outside corner



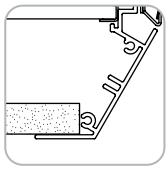
optional flanged end detail

DIMENSIONAL DATA

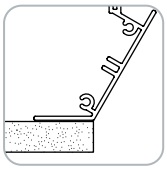
Grid Ceiling Shown



Mounting Details



Grid



Drywall
Ceiling mounts below housing.

FEATURES

Low profile LED wall wash provides a glowing transition between wall and ceiling.

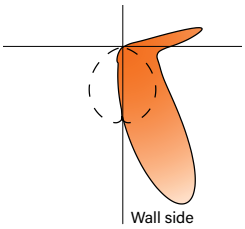
Housing creates 6" architectural slot with extruded splay to conceal light source from view at standard ceiling heights. Slight shadows between adjoining light modules may be perceptible when mounted into high ceilings..

Infinite lengths with the ability for pattern creation with 90° inside and outside corners.

Ease of installation and maintenance with rough-in housing and separate snap and lock LED light module.

Integrated sliding sleeve extends to meet precise dimensions of a finished space with +/- 2" adjustment.

PERFORMANCE



6' Luminaire,
450 Lumens per foot

Delivered Lumens:2700lm

Total System Watts: 28W

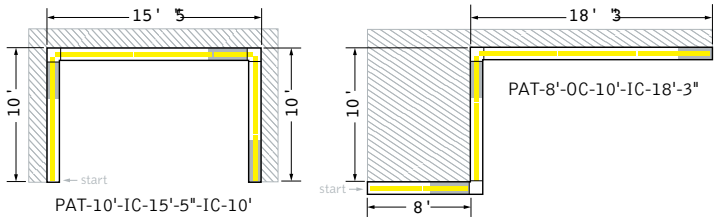
PRODUCT OVERVIEW

Lumen Output:	1500-5700lm
Wattage:	15-63W
LPW:	88-100
SDCM:	3

Photometric performance is measured in accordance with IESNA LM-79.
Visit focalpointlights.com for complete photometric data.

PATTERN CONFIGURATIONS (continued on page 3)

Wall-to-wall dimensions required. Integrated sliding sleeve accommodates +/-2" minimum field adjustment of luminaire.



IC - 90° Inside Corner
OC - 90° Outside Corner
Integrated Sliding Sleeve
LED Light Module

SPECIFICATIONS

LED System

Proprietary linear LED module incorporates premium LEDs on a robust platform to achieve excellent thermal management. Module is available in 2700K, 3000K, 3500K or 4000K with CRI > 80 or CRI>90. LED module and driver are replaceable from below.

Construction

One-piece, 22Ga. steel rough-in housing powder coated in matte satin white. Housing includes extruded splay in a matte satin white finish and steel alignment bracket. Light engine module constructed with 22Ga. steel and finished in matte satin white. Light engine must be installed after rough-in housing installation. Inside/outside corners and sliding sleeve fabricated with 22Ga. steel and include extruded aluminum splay. Fixture weight: 5.8 lbs/ft.

Optic

Semi-specular aluminum optical reflector with .020" thick diffuser lens. Light chamber does not provide fully continuous illumination, slight shadows may be perceptible between adjoining light modules, especially at high mounting heights.

Electrical

Light engine module includes driver and wiring harness. Single power drop can power up to 40' or more in a single run. Galvanized feed box with access plate provided for every start of run luminaire and installed in the field. Emergency circuit feed locations are field located by positioning of feed box. Standard 120-277V driver includes 0-10V analog dimming. Power factor > .9.

Labels

UL and cUL listed. Suitable for Dry or Damp Locations, indoor use only. Suitable for wood ceiling applications.

Emergency Battery

Bodine BSL-310LP. Emergency output for 90 minutes. Maximum mounting height: 12ft.

Finish

Polyester powder coat applied over a multi-stage pre–treatment.

Lumen Maintenance

Reported: L70 > 60,000 hours Calculated: L70 at > 95,000 hours

(Derived from EPA TM-21 calculator. Based on typical conditions, consult factory for additional data.)

Reliability

At Focal Point, our products are designed to stand the test of time. Each luminaire is engineered using superior components, manufactured with the utmost care and rigorously tested. Contact us for reliability data.

Warranty

LED system rated for operation in ambient environments up to 25°C. 5 year limited warranty.

6' PERFORMANCE CHART

Lumens per Foot	Delivered Lumens	Tested System Watts	LPW
250LF	1500	15	100
450LF	2700	28	96
650LF	3900	42	92
800LF	4800	51	90
950LF	5700	63	88

Based on 3500K, 80 CRI, 6' lengths. Lumen Multipliers: Preferred Light = 0.65, 90+ CRI = 0.87.
Lumen output may vary + /- 5%. Actual wattage may vary + /- 5%.

ORDERING

Luminaire Series		**FWSL**
Focus Wall Wash	FWSL	
Shielding		**FL**
Frosted Lens	FL	
Lumen Output		
250 Lumens per foot	250LF	
450 Lumens per foot	450LF	
650 Lumens per foot	650LF	
800 Lumens per foot (Not available with DALI)	800LF	
950 Lumens per foot (Not available with Lutron or DALI drivers)	950LF	
Color Temperature		
2700K, 80+ CRI **or** 90+ CRI	27K **or** 927K	
3000K, 80+ CRI **or** 90+ CRI	30K **or** 930K	
3500K, 80+ CRI **or** 90+ CRI	35K **or** 935K	
4000K, 80+ CRI **or** 90+ CRI	40K **or** 940K	
Circuits		**1C**
Single Circuit	1C	
Voltage		
120/277 UNV	UNV	
347 Volt (650LF & LD1 driver only)	347	
Driver		
0-10V - 10% Dimming	LD1	
0-10V - 1% Dimming	L11	
Lutron Hi-Lume EcoSystem (LDE1) - 1% Dimming	LH1	
DALI - 1% Dimming	D11	
Mounting		**U**
Universal	U	
Factory Options		
Air Return	AR	
Chicago Plenum	CP	
Emergency Circuit	EC	
Emergency Battery Pack	EM	
Flanged Ends	FL	
Finish		**WH**
Matte White Housing	WH	
Luminaire Length (2' minimum. Leave blank for pattern ordering.)		**ft** **in**
Specify luminaire/row length in 1" increments	_ft _in	
Pattern Options		
Specify patterns based on wall-to-wall dimensions (See Pattern Configurations for example)	PAT-	

Pattern Example: FWSL-FL-650LF-35K-1C-UNV-LD1-U-WH-**PAT-10'-IC-20'-5"-IC-10'**

PATTERN CONFIGURATIONS

Specify wall-to-wall dimensions in feet and inches. Integrated sliding sleeve accommodates +/- 2" minimum field adjustment of luminaire at corners and end of run.

FOCAL POINT®

KEY

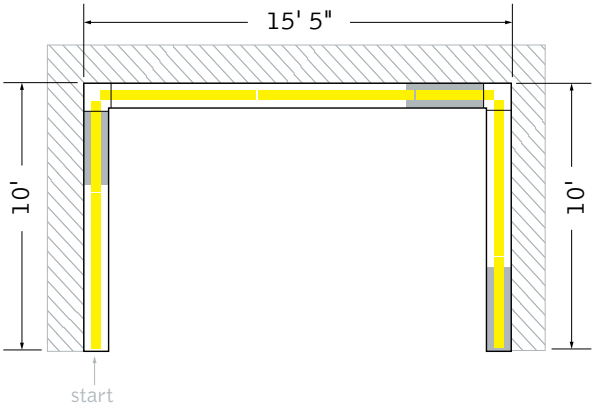
IC - 90° Inside Corner

OC - 90° Outside Corner

- Integrated Sliding Sleeve

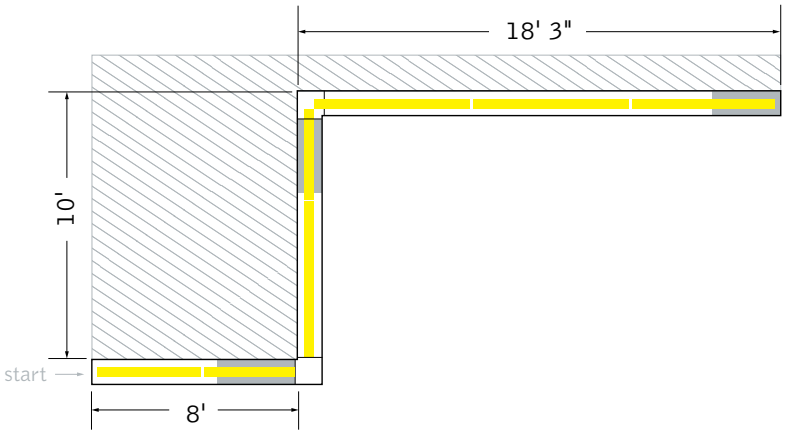
- LED Light Module

U-Pattern



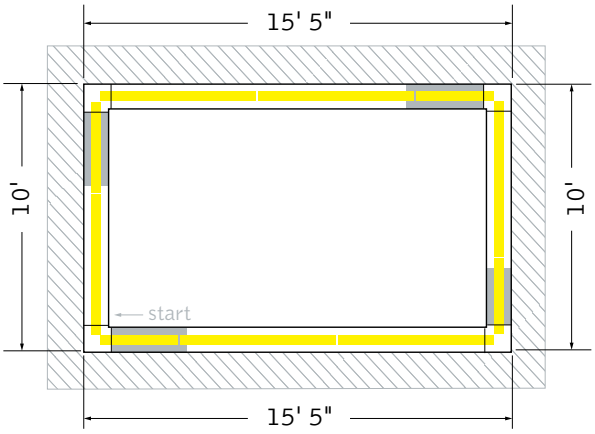
PAT-10'-IC-15'-5"-IC-10'

Z-Pattern



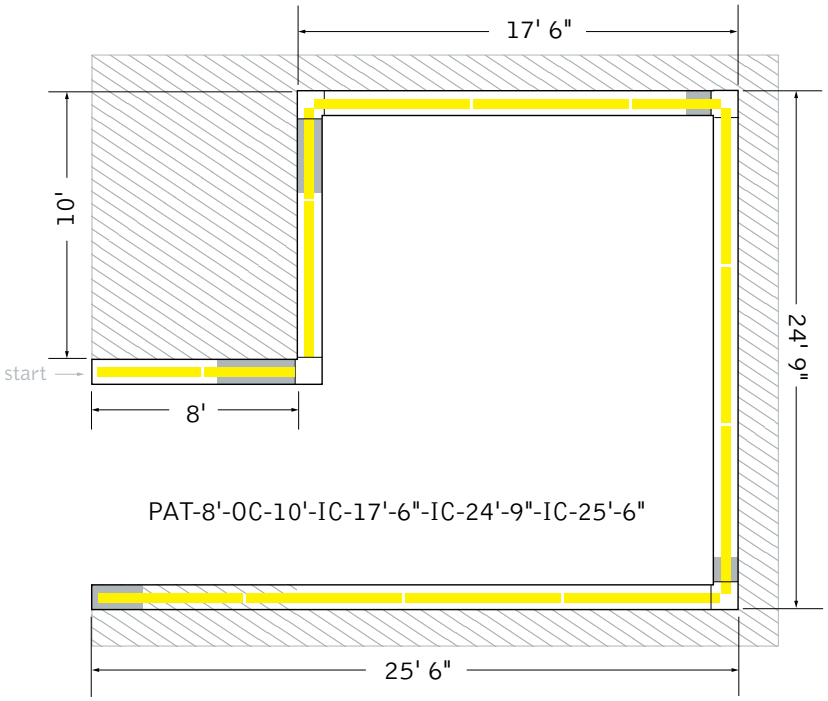
PAT-8'-OC-10'-IC-18'-3"

Square/Rectangular Pattern



PAT-10'-IC-15'-5"-IC-10'-IC-15'-5"-IC

Unique Pattern

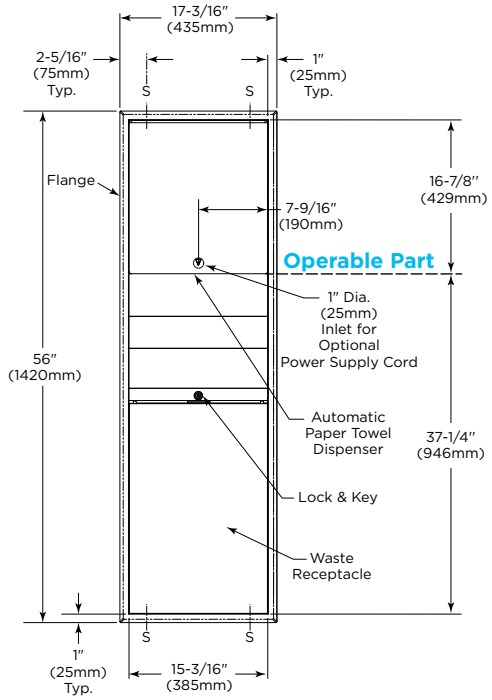


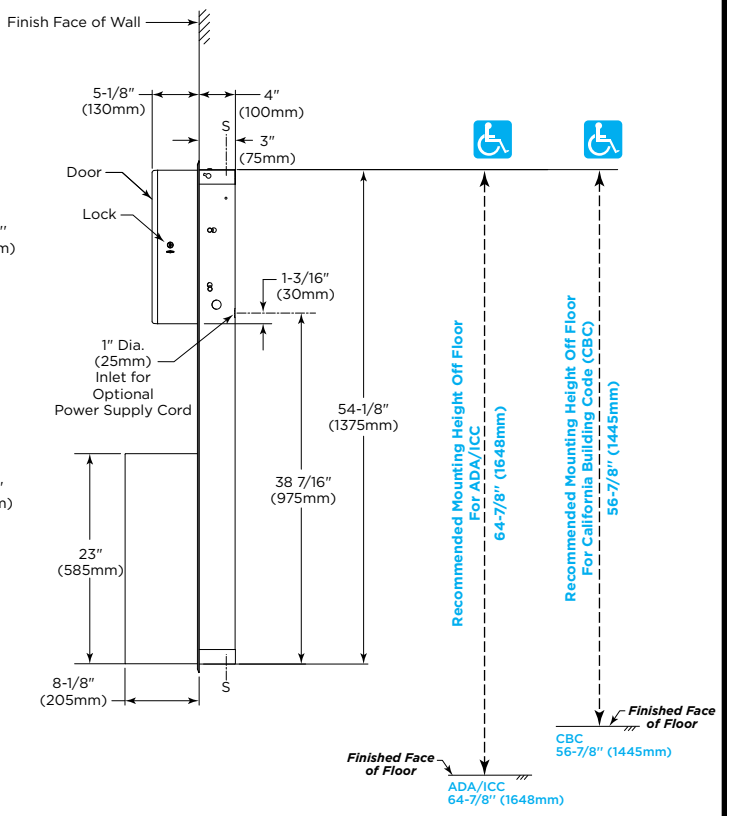
PAT-8'-OC-10'-IC-17'-6"-IC-24'-9"-IC-25'-6"

Technical Data

ClassicSeries® RECESSED CONVERTIBLE AUTOMATIC UNIVERSAL ROLL PAPER TOWEL DISPENSER AND WASTE RECEPTACLE

B-39747





Rough Wall Opening

16" (405mm) wide

54-3/4" (1390mm) high

4" (102mm) minimum recessed depth

ADA/CBC Installation Guidance

***Operable Part:** Towel dispenser towel outlet

Maximum mounting height of Operable Part:

ADA/ICC: 48" maximum above finished floor (AFF)
CBC: 40" maximum above finished floor (AFF)

*For more information regarding operable parts, please refer to Bobrick Planning Guide for Accessible Restrooms, page 9.

MATERIALS:

Cabinet — 18-8, Type-304, heavy-gauge stainless steel. Welded construction. Exposed surfaces have satin-finish. Equipped with a tumbler lock keyed like other Bobrick washroom accessories.

Flange — 18-8, Type-304, 22-gauge (0.8mm) stainless steel with satin-finish. Drawn and beveled, one-piece, seamless construction.

Door — 18-8, Type-304, 20-gauge (0.9mm) stainless steel with satin-finish. Drawn, one-piece, seamless construction. Secured to cabinet with full-length, stainless steel piano-hinge. Equipped with a tumbler lock keyed like other Bobrick washroom accessories.

Automatic Roll Towel Dispenser — Durable, high-impact resin materials. Accepts universal standard-core, non-perforated rolls up to 8" (205mm) wide, 8" (205mm) diameter. 800 ft (244 m) long. Dispenses one towel per dispense and can be set to dispense paper towels at three different lengths. Accommodates up to 3-1/2" (90mm) diameter stub roll with automatic transfer to full roll.

Waste Receptacle — 18-8, Type-304, 22-gauge (0.8mm) stainless steel with satin finish. Edges hemmed for safe handling. Secured to cabinet with a tumbler lock keyed like other Bobrick washroom accessories. Capacity: 18-gal. (68.0-L).

continued . . .

Revised 1/18/23

OPERATION:

Adjustable (2″, 3.5″, 4″) electronic sensor automatically dispenses towel when hands are placed under the towel opening. Intuitive LED light on door directs patrons to dispense area. Dispenses universal, 1-1/2″ to 2″ (38 to 51mm) diameter core, up to 8″ (205mm) diameter, 8″ (205mm) wide, non-perforated, non-proprietary paper towel rolls. LED light on the door flashes green when dispenser is ready to dispense, flashes red to indicate paper maintenance is required and red and green (alternating) to indicate low battery. Towel length can be set to short (10″), medium (12″) and long (14″) lengths. Dispenser can be set to "exposed" or "hidden" mode which determines whether a paper towel hangs down when in idle mode. Customizable sensor range can be set to 4″, 6″ or 8″. Dispenser includes a 3-1/2″ (90mm) diameter stub roll feature. Paper advance button dispenses paper when pressed.

To empty waste receptacle, unlock with key provided.

NOTE: LinerMate™ sold as an optional accessory to accommodate disposable trash liners. LinerMate™ eliminates unsightly trash liner overhang and facilitates installation and removal of disposable trash liners in the 12-gallon (45.5 L) waste receptacle.

Options:

- Folded Towel Dispenser Module convertible in field: order Bobrick Part No. 3944-152.
- Mechanical (Non-Automatic) Universal Touch-Free Roll Towel Dispenser Module convertible in field: order Bobrick Part No. 3961-50.
- 6-gallon (27.2 L) Waste Receptacle: order Bobrick Part No. 366-60.
- 12-gallon (45.5 L) Waste Receptacle: order Bobrick Part No. 367-60.
- 18-gallon (68.1 L) Waste Receptacle: order Bobrick Part No. 368-60.
- LinerMate™ for 12-gal (45.5 L) waste only: order Bobrick Part No. 3944-134.

POWER REQUIREMENTS:

Dispenser is powered by 4 "D" size alkaline batteries (not furnished) or an external 6-volt AC to DC switching power supply. Power supply is an optional accessory: order Bobrick AC Adapter Kit Part No. 3974-57. (For non-U.S. compatible plugs, order Part No. 3974-58).

INSTALLATION:

Provide framed rough wall opening 16″ wide x 54-3/4″ high (405 x 1390mm). Minimum recessed depth required to finish face of wall is 4″ (102mm). Allow clearance for construction features that may protrude into rough wall opening from opposite wall. Coordinate with mechanical engineer to avoid pipes, vents, and conduits. If unit projects above top of wainscot, provide channel or other filler to eliminate gap between flange and finish face of wall. Mount unit in wall opening with shims between framing and cabinet at all points indicated by an S, then secure unit with #8 x 1-1/4″ (4.2 x 32mm) sheet-metal screws (not furnished).

Open battery cover toward the back in the dispenser and install 4 "D" size alkaline batteries. Select sheet length and "Paper Saver" mode using the switches to the right of the batteries. Load paper towel using the instructions on the dispenser.

Electrical supply for use with 6-volt AC to DC power supply must be installed per applicable building codes.

SPECIFICATION:

Recessed convertible automatic universal roll paper towel dispenser and waste receptacle shall be Type-304 stainless steel with welded construction; exposed surfaces shall have satin-finish. Flange shall be drawn and beveled, one-piece, seamless construction. Door shall be secured to cabinet with a full-length stainless steel piano-hinge and equipped with a concealed tumbler lock keyed like other Bobrick washroom accessories. No-touch dispenser, equipped with an intuitive LED light to direct patrons to the dispense area, dispenses universal, 1-1/2″ to 2″ (38 to 51mm) diameter core, up to 8″ (205mm) diameter, 8″ (205mm) wide, non-perforated, non-proprietary paper towel rolls. 800 ft (244 m) long. Dispenser automatically dispenses towel when hands are placed under the towel opening. Dispenser can be powered by 4 "D" size alkaline batteries or an optional 6-volt AC to DC power supply. Equipped with switches that allow paper length to be set at 10″ (255mm), 12″ (305mm) or 14″ (355mm). Adjustable (2″, 3.5″, 4″) electronic sensor automatically dispenses towel when hands are placed under the towel opening. LED light on the door flashes green when dispenser is ready to dispense, flashes orange, indicating low battery, flashes red if not ready to dispense or in need of service. Automatic transfer shall dispense stub roll up to 3-1/2″ (90mm) diameter before new main roll is automatically dispensed. Removable waste receptacle shall be secured to cabinet with a tumbler lock, edges hemmed for safe handling, and shall have a minimum capacity of 18-gal. (68.0-L).

Recessed Convertible Automatic Universal Roll Paper Towel Dispenser And Waste Receptacle shall be Model B-39747 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Limited, United Kingdom.

B-39747 r1/18/23

BOBRICK

Technical Data

fino collection

SURFACE-MOUNTED AUTOMATIC HAND DRYER

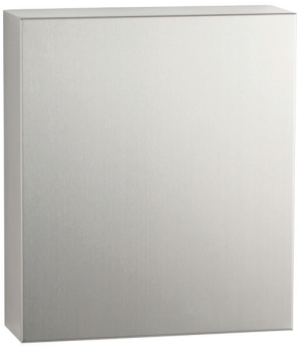
B-7179

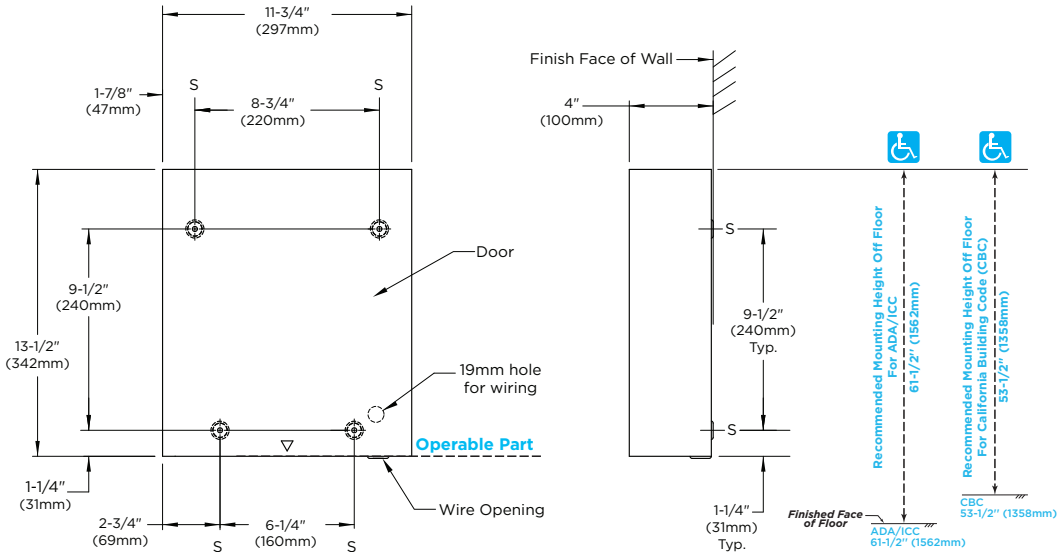
Specify Finish Required

- ☐ Stainless Steel, Satin Finish
- ☐ Matte Black Finish, please use model no. B-7179.MBLK

Universal Voltage:

- 110V–240V, 0.8–1.9 AMP, 50/60 Hz, 202–213 Watts, cULus Listed and CE marked.





ADA/CBC Installation Guidance

***Operable Part:** Electronic sensor on the bottom of the hand dryer cabinet.

Maximum mounting height of Operable Part:
ADA/ICC 48" (1220mm) above finished floor (AFF)
CBC: 40" (1015mm) above finished floor (AFF)

*For more information regarding operable parts, please refer to Bobrick Planning Guide for Accessible Restrooms, page 9.

MATERIALS:

Cover — 18-8, Type-304 stainless steel 18-gauge, 1.2mm thick with #4 satin-finish vertical grain. Air-inlet is vandal-resistant. Cover projects no more than 4" (100mm) from wall and is secured to mounting base with two recessed socket button head cap screws.

Mounting Base — 1.5mm SECC punched and formed.

Motor — Brushless 24Vdc with built in thermal protection. Ball bearings. Operates at 40,000 RPM.

Blower — Backward curved radial bladed impeller in polycarbonate housing.

Electronic Control — Infrared sensor automatically turns dryer on when hands are held under air-outlet opening and across path of sensor. Remove hands from path of sensor and dryer stops. Electronic sensor has automatic shutoff approximately 85 seconds after dryer turns on if an inanimate object is placed across air-outlet opening. After inanimate object is removed, electronic sensor automatically resets itself and dryer operates normally.

continued . . .

Revised 4/8/22

OPERATION:

Infrared sensor automatically turns dryer on when hands are held under air-outlet opening and across path of sensor. Remove hands from path of sensor and dryer stops. Electronic sensor has automatic shutoff approximately 85 seconds after dryer turns on if an inanimate object is placed across air-outlet opening. After inanimate object is removed, electronic sensor automatically resets itself and dryer operates normally.

5-Year Limited Warranty — In addition to Bobrick's one-year guarantee, Bobrick extends a limited 5-year warranty from the date of purchase on all parts for model B-7125. This warranty is limited to the repair or exchange of defective parts at the option of Bobrick and is only extended to the original owner of the installed unit against defects in factory workmanship or material under normal use and service.

INSTALLATION:

Wall preparation — Locate mounting base on wall using template provided. For brick, stone, and concrete walls drill four 0.315" (8mm) holes to suit provided wall plugs 0.315" x 1-1/4" (8 x 45mm) and screws # 10 x 2" (4.8 x 50mm) long. See template for wall plug and screw installation details. For plaster or dry wall construction, provide concealed backing to comply with local building codes and secure with four #10 (4.8) round-head sheet-metal screws or 3/16" (5mm) toggle bolts (not furnished). Provide electrical service from nearest distribution panel to dryer mounting base in conformance with local electrical codes.

Dryer Wiring Instructions:

1. For 115-Volt Dryers — Connect ground wire to ground terminal marked ⏚, the black or hot wire to terminal marked L1, and neutral or white wire to terminal marked N.

2. For 208–240-Volt Dryers — Connect ground wire to ground terminal marked ⏚ and the 208- or 240-volt wires to terminal marked L1 and L2.

3. This is a class 1 product and requires grounding.

Notes: Electronic sensor in Automatic dryers will pick up movement within 6" (150mm) of the air-outlet opening. Use caution when choosing location for Automatic dryers in confined areas. Consider proximity to doorways and other traffic areas. Bobrick automatic hand dryers should be installed at least 19-3/4" (500mm) above any projection or horizontal surface which may interfere with the operation of the automatic sensor.

Replacement Parts:

Cover	7179-150
Controller	7125-25
Controller Loom (Wiring)	7125-30

SAFETY WARNING:

Installation and wiring must conform to current local regulations and building codes. Unit must be installed by a qualified electrician. Turn off electrical power supply before making electrical connections. If the unit fails or malfunctions, it should be disconnected from the power supply and a qualified electrician should be called. To avoid potential injury, the building owner or maintenance personnel should remove the unit from service if the grille is missing or damaged.

SPECIFICATION:

Surface-mounted high-speed hand dryer shall have an energy consumption of only 200 watts. Unit shall have 18-gauge (1.2mm) thick Type-304 stainless steel cover with #4 satin finish vertical grain. The slim profile cover shall project no more than 3 7/8" (98mm) from the finished face of wall to comply with accessible design guidelines (including ADAAG in the U.S.A.) and have a dry time of less than 12 seconds. Dryer shall be universal, to accommodate voltages between 110-240V. Dryer shall be secured to concealed mounting bracket with vandal-resistant screws. Electronic sensor automatically turns dryer on when hands are held under air-outlet opening and across path of sensor. Dryer turns off automatically when hands are removed. Sensor automatically shuts dryer off approximately 85 seconds after dryer turns on if an inanimate object is placed across air-outlet opening. After object is removed, electronic sensor automatically resets itself and dryer operates normally. Unit is cULus listed and is CE marked. Dryer has a limited 5-year warranty on all parts.

Surface-Mounted Automatic Hand Dryer shall be Model B-7179 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

Industrial IL7302-03-04-06

Stellar open aperture LED pristmatic low bay

CONSTRUCTION

- Canopy mounts to standard J-box.
- Die cast aluminum housing and heat sink.
- Clear prismatic acrylic shade.
- 6 ft. power cord supplied, standard. Specify **XP** for additional length (25 ft. max.).
- Default finish/power cord pairings are silver/gray, white/white, black/black.
- For RAL colors, power cord color must be specified.
- For differing fixture/canopy colors, please consult factory.

- Drivers are universal voltage (120–277V), integral or remote.
- Component design provides maximum airflow for cool operation.
- cUL listed for dry locations, standard drivers; damp locations only for remote drivers.

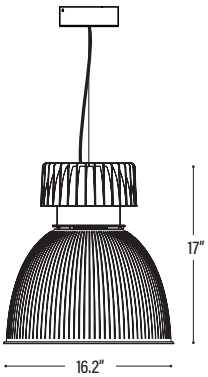
TYPE:	**PROJECT:**
ORDER NUMBER:	

MODEL#	LEDS	FINISH	DIMMING	OPTION	OPTION
IL7302 **IL7303** **IL7304** **IL7306**	**W30** **W35** **W40**	**S**–Silver **W**–White **K**–Black **CC**–RAL Color*	**D**–Standard 0-10V **BDIM-W11** **DA**–DALI	**EM**–Emergency	**BA**–Ball aligner
Example:					
IL7306	**W35**	**1**	**D**		

XP–Extra power cord (in inches, 25 ft. max.):		Specify **canopy** finish (silver, white, black):	
EB–Earthquake Bracing Kit (enter quantity):		Specify power cord color (gray, white, black):	
XL–Custom lumen reduction (specify lumens):		*Specify RAL color number:	
CM1–Pipe mount (24 in. included, specify total length):			

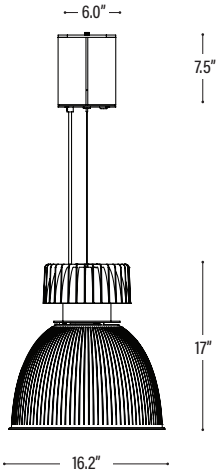
IL7302
30 watts

IL7303
36 watts

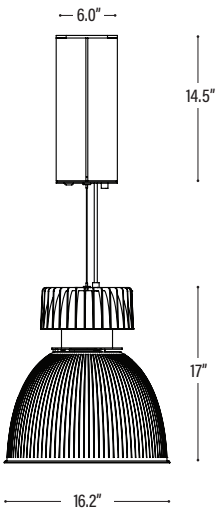


IL7304
47 watts

IL7306
83 watts



EM
Emergency Battery Pack
10W for 90 minutes



OCT 2022

Industrial IL7302-03-04-06

Stellar open aperture LED pristmatic low bay

WHITE LEDS
Nichia Corp. NFSL757 linear board chips. 90 CRI. Specify color: **W30**–3000º Kelvin, **W35**–3500º Kelvin, or **W40**–4000º Kelvin.

CUSTOM LUMEN OUTPUT REDUCTION
Factory set custom reduced-lumen output driver configuration. Order **XL**. Specify lumens.

DIMMING
- **D**–standard supplied driver. 0–10V, programmable, 1% dimming, 120/277V, 50/60 Hz.
- **BDIM-W11**–Lutron EcoSystem LED14 Series, 1% dimming, fade-to-off.
- **DA**–DALI, 1% dimming, fade-to-off. 120/277V, 50/60 Hz.

EMERGENCY
Battery pack provides 90 minutes. See drawing on page 1. Order **EM**.

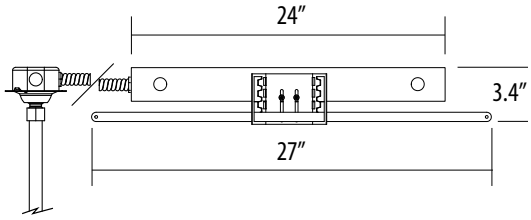
mA / WATTS / LUMENS

MODEL	CURRENT (mA)	WATTS	DELIVERED LUMENS
IL7302	750	30	2,000
IL7303	900	36	3,000
IL7304	940	47	4,000
IL7306	1,700	83	6,000

CM1–1/2" ID hard stem option, supplied with swivel canopy for earthquake code, sloped ceilings, and indoor areas with light air movement (e.g., near HVAC vents). Pipe replaces power cord and cable. Length must be specified.

Pipe longer than 8 ft. will be shipped in two sections —one 8 ft., the other for the balance—with painted, threaded pipe coupler and set screws.

Remote installed required.



NOTE: Aircraft cable suspension is not recommended for outdoor use, where fixture will be exposed to water, or subject to wind oscillation. Avoid use near HVAC vents and in environments with corrosive chemical vapors, such as swimming pools.

Industrial IL7702

Sonar I frosted lens LED metal low bay with 6W uplight

CONSTRUCTION

- Canopy mounts to standard J-box.
- Die cast aluminum housing and heat sink.
- Spun matte anodized .063 aluminum housing.
- Frosted 3/16" tempered, soda lime glass with 2 in. ventilation opening. Secured with a rubber gasket, the lens is held in place by three positive-locking clamps.
- 6 ft. 18 AWG power cord supplied, standard. Specify **XP** for additional length (25 ft. max.). Default finish/power cord pairings are anodized/gray, white/white, black/black.
- For RAL colors, power cord color must be specified.
- For differing fixture/canopy colors, please consult factory.
- Standard finish is **A**-Anodized. All other finish options require price adder.
- Lens and component design provides maximum airflow for cool operation.
- Drivers are universal voltage (120–277V), integral or remote.
- cUL listed for dry locations only.

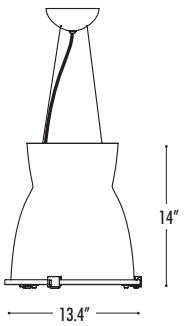
TYPE:	PROJECT:
ORDER NUMBER:	

MODEL#	FINISH	OUTPUT	LEDS		DIMMING	OPTIONS
			DOWN	UP		
IL7702	**A**–Anodized **W**–White **K**–Black **CC**–RAL Color*	**LO** **MO** **HO****	**W30** **W35** **W40** **RGBW**–color + 3500° K white	**W30** **W35** **W40** **RGBW**–color + 3500° K white	**D**–Standard **BDIM-W11** **DA**–DALI **DMX** **DPH**–Phase (**LO**, **MO** 120V only)	**RD** **SM** **EM** **RDEM** **SMEM** **TB**
Example:						
IL7802	**A**	**LO**	**W35**	**RGBW**	**D**	**RD, TB**

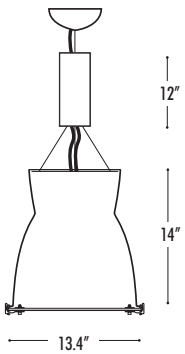
BDMXCON-W–white faceplate (enter quantity):		**XP**– Extra power cord (in inches, 25 ft. max.):	
BDMXCON-B– black faceplate (enter quantity):		Specify canopy finish (silver, white, black):	
EB– Earthquake Bracing Kit (enter quantity):		Specify power cord color (gray, white, black):	
XL– custom lumen reduction (specify lumens):		*Specify RAL color number:	

****DPH**–Phase dimming not available for **HO**.

IL7702
For up/down watts & delivered lumens, see p. 2.



IL7702/EM
Emergency Battery Pack
10W for 90 minutes



OCT 2021

Industrial IL7702

Sonar I frosted lens LED metal low bay with 6W uplight

WHITE LEDS
Nichia Corp. chips, available in three colors: **W30**–3000°, **W35**–3500° or **W40**–4000° Kelvin.

CUSTOM LUMEN OUTPUT REDUCTION
Factory-set custom reduced-lumen output driver configuration. Order **XL**. Specify lumens.

COLOR LEDS
RGBW with 3500° K white. Includes RGBW interface. Optional DMX controller also available (below).

OPTIONAL DMX CONTROLLER
- Standalone, wall-mounted DMX controller for **RGBW** LEDs that provides direct access to fixtures. Power supply included.
- Tune color hue with sensitive wheel. Saturation and brightness control. On/off switch.
- See https://www.nicolaudie.com/en/stick-cw4.htm for details.

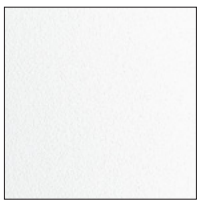
Order separately, either **BDMXCON-W**–white faceplate or **BDMXCON-B**–black faceplate.

WATTS / LUMENS

	WHITE LEDs (3500°K)			
	WATTS		DELIVERED LUMENS	
OUTPUT	UP	DOWN	UP	DOWN
HO	6	56	1,050	5,400
MO	6	42	1,050	3,780
LO	6	28	1,050	2,700
RGBW	6	50	N/A	N/A

PAINT FINISHES

A-Anodized



W-White

K-Black

NOTE: Standard finish is **A**-Anodized. All other finish options require price adder.

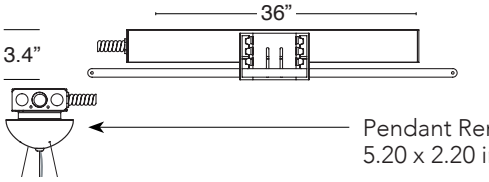
NOTE: Aircraft cable suspension is not recommended for outdoor use, where fixture will be exposed to water or subject to wind oscillation. Avoid use near HVAC vents and in environments with corrosive chemical vapors, such as swimming pools.

DIMMING
- **D**–standard supplied driver. 0–10V, programmable, 1% dimming, 120–277V, 50/60 Hz.
- **BDIM-W11**–Lutron EcoSystem LED14 Series, 1% dimming, fade-to-off.
- **DPH**–Triac and ELV 1% dimming at 120V 60 Hz, **LO** and **MO** only.
- **DA**–DALI 1% dimming, fade-to-off. 120–277V, 50/60 Hz.
- **DMX**–for both white and **RGBW** LEDs, 0.1% dimming fade-to-off. 120/277V 50/60Hz.

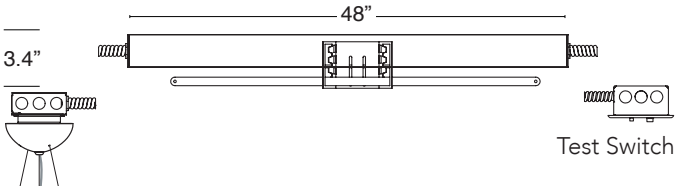
EMERGENCY
Battery pack provides 10W for 90 minutes. See drawing, p. 1. Order **EM**.

REMOTE DRIVERS
Driver must be accessible after installation. For suspended and hard lid ceilings with access panels. Standard pendant length: 8 ft. Specify **XP** for extra pendant. Maximum canopy to fixture distance: 25 ft. Maximum canopy to driver distance: 100 ft. (with 10 AWG wire). DMX requires 48" driver enclosure.

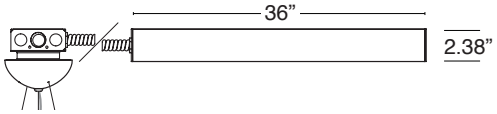
RD–Above ceiling remote driver installation: **TB**–T-Bar install shown.



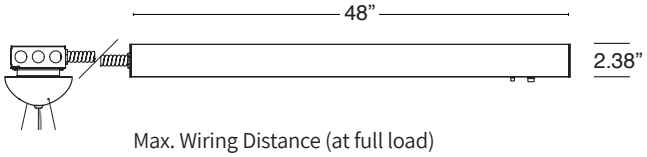
RDEM–Above-ceiling installation with emergency. **TB**–T-Bar install shown.



SM–Surface mount installation:



SMEM–Surface mount installation with emergency:



Max. Wiring Distance (at full load)	
Wire Size (AWG)	Distance (ft.)
18	18
16	29
14	46
12	71
10	120

OCT 2021

//// PARCEL PENDING®
by Quadient

Standard Indoor Locker System

Parcel Pending's indoor locker systems are designed and engineered for multiple package management applications that facilitate a seamless and convenient package delivery process for multifamily properties.

Parcel Pending parcel lockers make package management simple, freeing up time and space for both residents and property management.

Locker Specs

- 18-gauge double-reinforced cold-rolled steel construction
- Operational conditions: temperature +41° to +95° F - humidity up to 80% non-condensing
- Control towers feature an industrial-grade indoor touchscreen, a camera for photo capture, a keypad, a scanner supporting 1D and 2D barcode reading, and speakers
- Each door features smart package sensors to detect packages and other items
- Locker design is compliant with the Americans with Disabilities Act (ADA) - Every door size is available within the "reachable" range for wheelchair users, and control touchscreen and barcode scanner are also compliant for wheelchair accessibility
- Locker system is anchored on the wall or on the ground depending on setup and location
- Each tower is bolted and secured together
- Cloud-based video surveillance is available as an option
- Lockers are certified for UL/CSA safety standards - UL/CSA 62368 and UL/CSA 60950
- Lockers are RoHS and REACH compliant

Colors

Stone Grey (RAL7030)

Brown Grey (RAL7013)

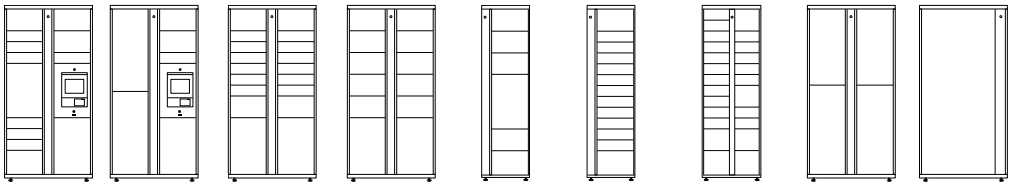
Jet Black (RAL9005)

Custom wraps available

www.parcelpending.com | sales@parcelpending.com | (844) 657-4608

//// PARCEL PENDING®
by Quadient

Standard Indoor Locker System



Tower specs

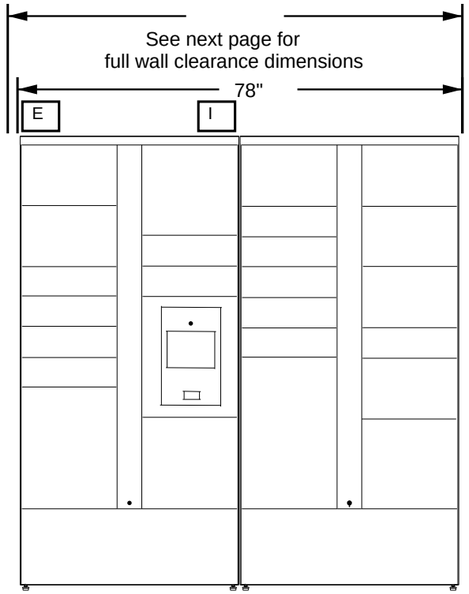
Total Doors (internal size in inches W x D x H) / (Max weight in lbs)	**D13** control tower	**D6** control tower	**D18**	**D12**	**S6**	**S13**	**M23**	**D4**	**D1**
Small (13.59 x 23.1 x 4.23) / (33)	7	1	12			11			
Medium (13.59 x 23.1 x 9.25) / (33)	4	2	4	10	5	2			
Large (13.59 x 23.1 x 24.33) / (44)	2	1	2	2	1				
X-Large (13.59 x 23.1 x 36.85) / (44)		2						4	
H-Small (7.39 x 23.1 x 4.23) / (33)							17		
H-Medium (7.39 x 23.1 x 9.25) / (33)							6		
Ultra (30.42 x 22.06 x 74.33) / (220)									1
Weight (lbs)	397	353	408	375	203	294	388	309	287

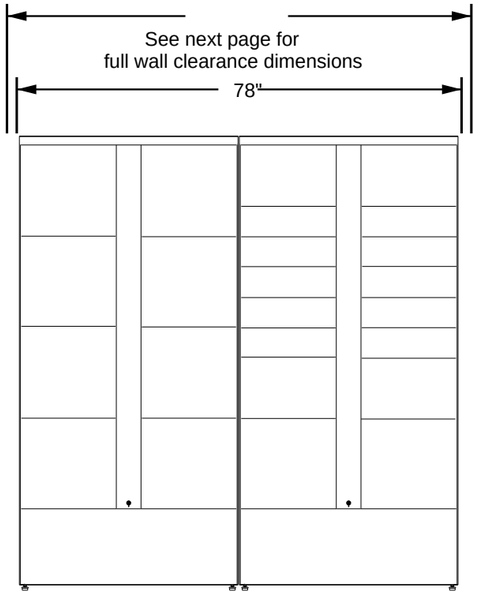
Tower measurements (in inches W x D x H)*

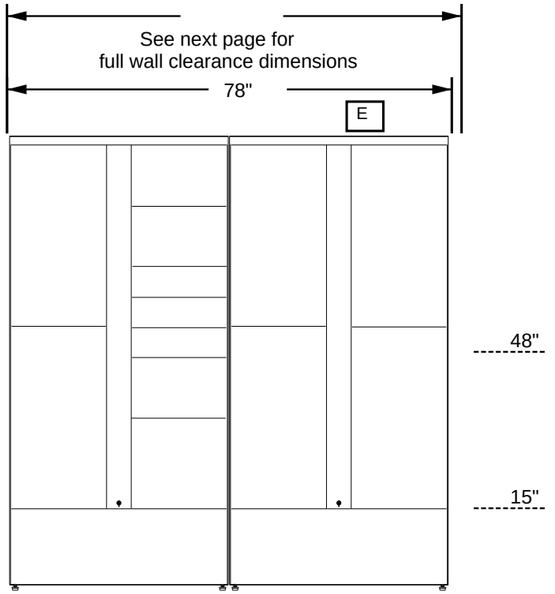
D13, D6, D18, D12, D4, D1	39.5 x 24 x 80.9~81.7
S13, S6	22.5 x 24 x 80.9~81.7
M23	27 x 24 x 80.9~81.7

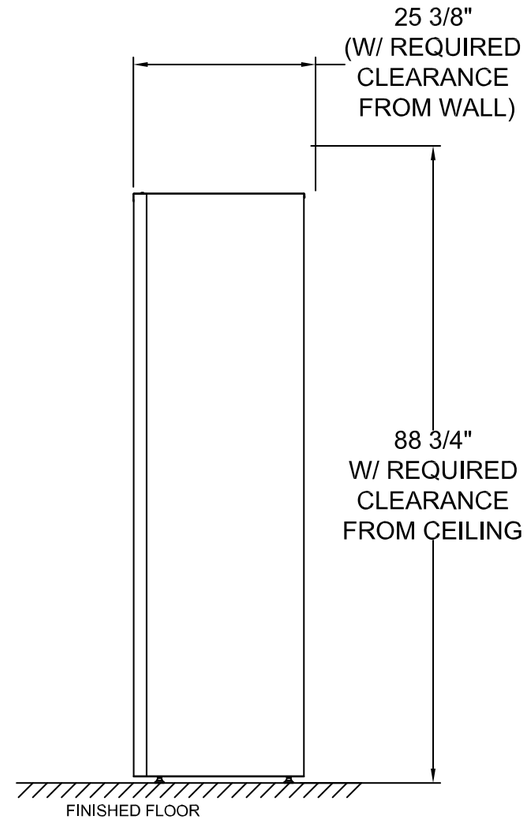
* includes slight adjustments to tower feet for balancing and leveling purposes

POW+ETH		POW	
1	2	3	4	5	6
ELIK11A-PC	ELIM13A	ELIM08A	ELIM16A	ELIM09A	ELIM04A









System Overview

1. Locker Series: Element Indoor
2. Installation Type: U-shaped
3. Color Finish: Black
4. Total Package Lockers: 61
5. Total Dry Cleaning Lockers: 0

Site Preparation Requirements (Provided by Others):

1. Electrical and Internet outlets must be installed with bottom of the faceplates at 83" FFF. If outlets are surface mounted, bottom of faceplates must be at 84.5" FFF.
2. System dimensions shown above should be verified in the field to confirm the system fits within the desired space
3. Each locker module has a typical dimension tolerance of +/- 1/8"
4. Actual Locker Height is: 82-1/4" - 83-3/4" (range due to adjustable leveling feet)
5. Actual Locker Depth is: 23-7/8"
6. If the system will be recessed and trimmed in, all finished trim must be completed after installation

Module/Tower Count	
Module	**Qty.**
ELIM04A	1
ELIM08A	1
ELIM09A	1
ELIM10A	0
ELIM13A	1
ELIM16A	1
ELIK11A-PC	1
ELIM04A-DCL	0
Total:	6

Locker Compartment Information (inches)				
Type	**Qty.**	**Height**	**Width**	**Depth**
1-High	25	4.8	13.5	22.5
2-High	14	10.3		
3-High	14	15.8		
4-High	1	21.3		
5-High	1	26.8		
6-High	6	32.3		
D6-High	0	32.3		
Total:	61			

DO NOT SCALE OFF THIS DRAWING

ELEVATION: Front View / Profile | Bank 1

ARCHITECT: Vivian Walker

PROJECT NAME: Larimer Tennant Fit Out

DRAWN BY: Vivian Walker

CREATED: 06/11/2023

LOCATION: Pittsburgh ,PA

INSTALL BY: Jun, 2024

REFERENCE NO: 230608

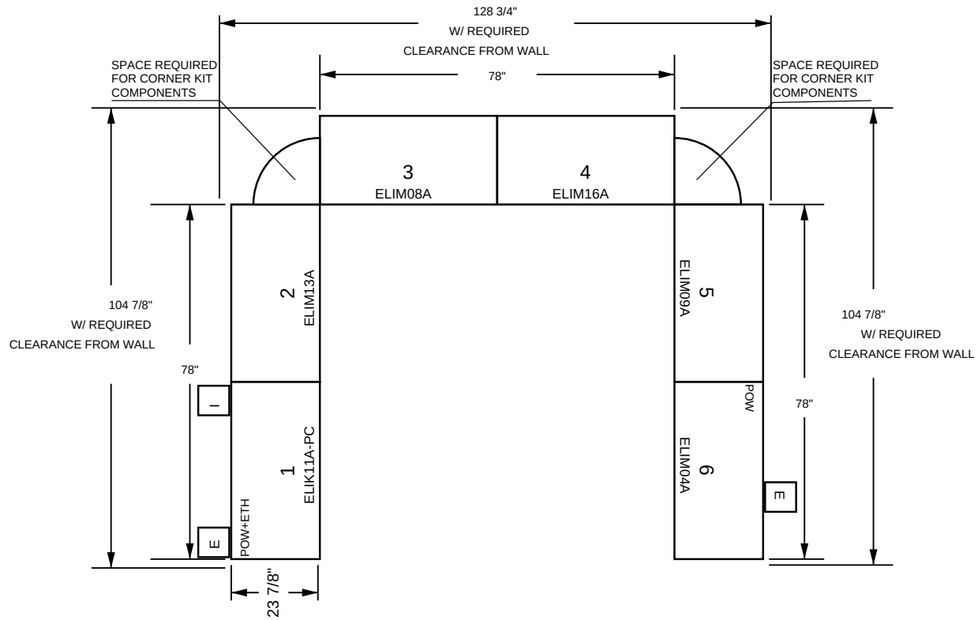
DRAWING NO. WEB-16483

SHEET 1

PACKAGE CONCIERGE
packageconcierge.com
Manufactured by Florence Corporation

APPROVED SIGNATURE:

PRINTED NAME/DATE:



System Overview

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2. Installation Type: U-shaped
3. Color Finish: Black
4. Total Package Lockers: 61
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Site Preparation Requirements (Provided by Others):

1. Electrical and Internet outlets must be installed with bottom of the faceplates at 83" FFF. If outlets are surface mounted, bottom of faceplates must be at 84.5" FFF.
2. System dimensions shown above should be verified in the field to confirm the system fits within the desired space
3. Each locker module has a typical dimension tolerance of +/- 1/8"
4. Actual Locker Height is: 82-1/4" - 83-3/4" (range due to adjustable leveling feet)
5. Actual Locker Depth is: 23-7/8"
6. If the system will be recessed and trimmed in, all finished trim must be completed after installation

Module/Tower Count	
Module	**Qty.**
ELIM04A	1
ELIM08A	1
ELIM09A	1
ELIM10A	0
ELIM13A	1
ELIM16A	1
ELIK11A-PC	1
ELIM04A-DCL	0
Total:	6

Locker Compartment Information (inches)				
Type	**Qty.**	**Height**	**Width**	**Depth**
1-High	25	4.8	13.5	22.5
2-High	14	10.3		
3-High	14	15.8		
4-High	1	21.3		
5-High	1	26.8		
6-High	6	32.3		
D6-High	0	32.3		
Total:	61			

DO NOT SCALE OFF THIS DRAWING

ELEVATION: Floorplan View | Bank 1
ARCHITECT: Vivian Walker
PROJECT NAME: Larimer Tennant Fit Out
DRAWN BY: Vivian Walker
CREATED: 06/11/2023
LOCATION: Pittsburgh ,PA
INSTALL BY: Jun, 2024
REFERENCE NO: 230608
DRAWING NO. WEB-16483
SHEET 2

PACKAGE CONCIERGE
packageconcierge.com
Manufactured by Florence Corporation

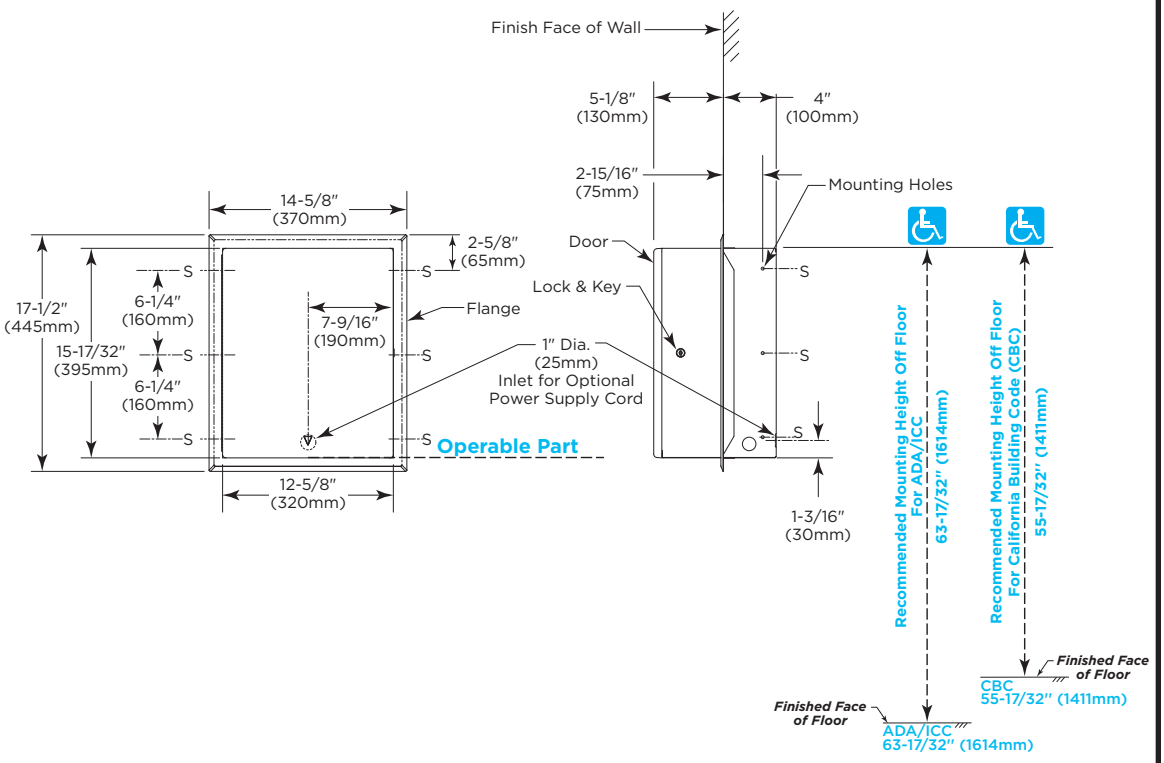
APPROVED SIGNATURE:
PRINTED NAME/DATE:

BOBRICK

Technical Data

SEMI-RECESSED AUTOMATIC, UNIVERSAL ROLL PAPER TOWEL DISPENSER

B-29744



Rough Wall Opening

13" (330mm) wide

16" (405mm) high

4" (102mm) minimum recessed depth

ADA/CBC Installation Guidance

***Operable Part:** Towel dispenser towel outlet

Maximum mounting height of Operable Part:

ADA/ICC: 48" maximum above finished floor (AFF)

CBC: 40" maximum above finished floor (AFF)

*For more information regarding operable parts, please refer to Bobrick Planning Guide for Accessible Restrooms, page 9.

MATERIALS:

Cabinet — 18-8, Type-304, heavy-gauge stainless steel. All-welded construction. Exposed surfaces have satin finish. Equipped with a tumbler lock keyed like other Bobrick washroom accessories.

Door — 18-8, Type-304, 20-gauge (0.9mm) stainless steel with satin finish. Drawn, one-piece, seamless construction. Secured to cabinet with a full-length stainless steel piano-hinge.

Flange — 18-8, Type-304, 22-gauge (0.8mm)stainless steel with satin finish. Drawn, one-piece, seamless construction.

Shell — 18-8, Type-304, 22-gauge (0.8mm) stainless steel. All welded construction. Exposed surfaces have satin-finish.

Automatic Roll Towel Dispenser — Durable, high-impact resin materials. Accepts universal standard-core, non-perforated rolls 8" (205mm) wide, 8" (205mm) diameter. 800 ft (244 m) long. Dispenses one towel per dispense and can be set to dispense paper towels at three different lengths. Accommodates up to 3-1/2" (90mm) diameter stub roll with automatic transfer to full roll.

continued . . .

OPERATION:

Adjustable (2″, 3.5″, 4″) electronic sensor automatically dispenses towel when hands are placed under the towel opening. Intuitive LED light on door directs patrons to dispense area. Dispenses universal, 1-1/2″ to 2″ (38 to 51mm) diameter core, up to 8″ (205mm) diameter, 8″ (205mm) wide, non-perforated, non-proprietary paper towel rolls. LED light on the door flashes green when dispenser is ready to dispense, flashes slowly red to indicate it needs paper and red and green (alternating) to indicate low battery. Towel length can be set to short 10″, medium 12″ and long 14″ lengths. Dispenser can be set to exposed or hidden mode which determines whether a paper towel hangs down when in idle mode. Customizable sensor can be set to 4″, 6″ or 8″. Dispenser includes a 3-1/2″ (90mm) diameter stub roll feature. Paper advance button dispenses paper when pressed.

POWER REQUIREMENTS:

Dispenser is powered by 4 “D” size alkaline batteries (not furnished) or an external 6-volt AC to DC switching power supply. Power supply is an optional accessory: order Bobrick AC Adapter Kit Part No. 3974-57. (For non-U.S. compatible plugs, order Part No. 3974-58).

INSTALLATION:

Provide framed rough wall opening 13″ wide x 16″ high (345x 420mm). Minimum recessed depth required to finish face of wall is 4″ (102mm). Allow clearance for construction features that may protrude into rough wall opening from opposite wall. Coordinate with mechanical engineer to avoid pipes, vents and conduits. If unit projects above top of wainscot, provide channel or other filler to eliminate gap between flange and finish face of wall. Unlock and open the door of the dispenser cabinet. Mount unit in wall opening with shims between framing and cabinet at all points indicated by an S, then secure with #8 x 1/2″ (4.2 x 13mm) sheet metal screws. For above counter installation, the unit sensor must be installed 7.5″ above the counter or any protrusion. Above counter installation is not permitted in the state of California.

Open battery cover at the front of the dispenser and install 4, “D” size alkaline batteries. Select sheet length and “Paper Saver” mode using the switches to the right of the batteries. Load paper towel using the instructions on the dispenser.

Electrical supply for use with 6-volt AC to DC power supply must be installed per applicable building codes.

SPECIFICATION:

Semi-recessed mounted automatic universal roll paper towel dispenser shall be Type-304 stainless steel with all-welded construction; exposed surfaces shall have satin finish. Door shall be secured to cabinet with a full-length stainless steel piano-hinge and equipped with a concealed tumbler lock keyed like other Bobrick washroom accessories. No-touch dispenser, dispenses universal, 1-1/2″ to 2″ (38 to 51mm) diameter cores, up to 8″ (205mm) diameter, 8″ (205mm) wide, non-perforated, non-proprietary rolls. 800 ft (244 m) long. Dispenser automatically dispenses towel when hands are placed under the towel opening. Dispenser can be powered by 4 “D” size alkaline batteries or an optional 6-volt AC to DC power supply. Equipped with switches that allow paper length to be set at 9″ (230mm), 12″ (305mm) or 15″ (380mm) and “Paper Saver” feature that provides a shorter second sheet with options of 25% shorter and 12.5% shorter. Blinking LED indicates if batteries need to be replaced. Automatic transfer shall dispense stub roll up to 3-1/2″ (90mm) diameter before new roll is dispensed.

Semi-Recessed Automatic Universal Roll Paper Towel Dispenser shall be Model B-29744 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

B-29744 r1/5/23

DELRAY LIGHTING INCORPORATED

LED PENDANTS

& SEMI-RECESSED DOWNLIGHTS

KONE3 • ASPECT • INDUSTRIAL • 4702/3L • 4742/3L

Kone3 pendants

KONE3's unique clear/opal glass design creates both upper zone glow and downlight from a single Cree LED module.

LEDs

W30–White (3000° K)
W35–White (3500° K)
W40–White (4000° K)

DIMMING

D1: Philips 0–10V, 1%

D9A: Hi-Lume, A-Series, 1%

D11: EcoSystem H-Series,1%

EMERGENCY

KLPEM–emergency battery pack, 7W for 90 minutes

4742L
2000 lumens, 21 watts

4743L
3000 lumens, 31 watts

KLP34 upview

Kone3 semi-recessed

KLS312
2000 lumens, 21 watts

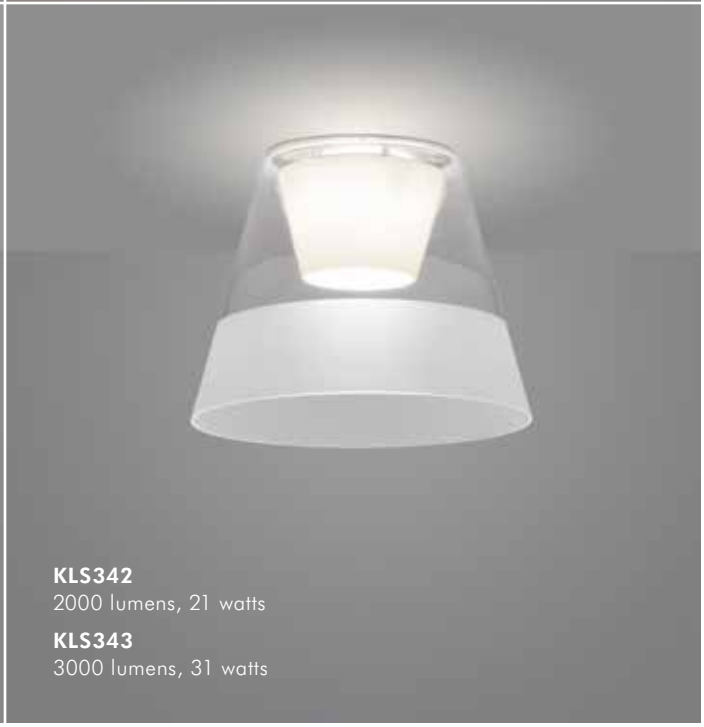
KLS313
3000 lumens, 31 watts

KLS322
2000 lumens, 21 watts

KLS323
3000 lumens, 31 watts

KLS332
2000 lumens, 21 watts

KLS333
3000 lumens, 31 watts



KLS342
2000 lumens, 21 watts

KLS343
3000 lumens, 31 watts

LEDs

W30–White (3000° K)
W35–White (3500° K)
W40–White (4000° K)

DIMMING

D1: Philips 0–10V, 1%

D9A: Hi-Lume, A-Series, 1%

D11: EcoSystem H-Series,1%

EMERGENCY

EM–emergency battery pack, 7W for 90 minutes

AL2367
2,750 lumens, 20 watts

Aspect pendants

AL2277
2,750 lumens, 20 watts

AL2297
2,750 lumens, 20 watts

AL2347
2,750 lumens, 20 watts

AL2387
2,750 lumens, 20 watts

LEDs
W30–White (3000° K)
W35–White (3500° K)
W40–White (4000° K)

DIMMING

D1: Philips 0–10V, 1%

D9A: Hi-Lume, A-Series, 1%

D11: EcoSystem H-Series,1%

EMERGENCY

ALEM–7W for 90 minutes

FINISHES

S–Silver
H–Hammertone
W–White
CC–Custom RAL Color

GLASS

I–Indigo
M–Marine
O–Opal
T–Tangerine

IL7802
Gibson Guitars
Los Angeles, CA

Industrial Sonar, lensed

IL7700 – 5800 lumens down
IL7701 – 5000 lumens down, 1500 lumens up
IL7702 – 4200 lumens down, 800 lumens up

IL7800 – 5800 lumens down
IL7801 – 5000 lumens down, 1500 lumens up
IL7802 – 4200 lumens down, 800 lumens up

Lens cut away
to reveal LED panel.

LEDs

W30–White (3000° K)
W35–White (3500° K)
W40–White (4000° K)

DIMMING

D1: Philips 0–10V, 1%

D9A: Hi-Lume, A-Series, 1%

EMERGENCY

EM–7W for 90 minutes

SEPARATE SWITCHING

SS–Separate Switching (**IL7701** and **IL7801** only.)

IL7814
Gibson Guitars
Los Angeles, CA

Rocket LED upview

Industrial Rocket & Stellar, no lens

IL7712 – 2000 lumens, 21 watts
IL7713 – 3000 lumens, 31 watts
IL7714 – 4000 lumens, 38 watts
IL7716 – 6000 lumens, 71 watts

IL7812 – 2000 lumens, 21 watts
IL7813 – 3000 lumens, 31 watts
IL7814 – 4000 lumens, 38 watts
IL7816 – 6000 lumens, 71 watts

IL7302 – 2000 lumens, 21 watts
IL7303 – 3000 lumens, 31 watts
IL7304 – 4000 lumens, 38 watts
IL7306 – 6000 lumens, 71 watts

LEDs

W30–White (3000° K)
W35–White (3500° K)
W40–White (4000° K)

DIMMING

D1: Philips 0–10V, 1%

D9A: Hi-Lume, A-Series, 1%
2000, 3000, and 4000 lumens only

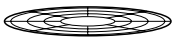
D11: EcoSystem H-Series,1%
2000, 3000, and 4000 lumens only

EMERGENCY

EM–7W for 90 minutes

WIRE GUARD

IL730 *Stellar only.*



4702L semi-recessed downlight

4702L
2000 lumens, 21 watts

4703L
3000 lumens, 31 watts

LEDs

W30–White (3000° K)
W35–White (3500° K)
W40–White (4000° K)

DIMMING

D1: Philips 0–10V, 1%

D9A: Hi-Lume, A-Series, 1%

D11: EcoSystem H-Series,1%

EMERGENCY

EM–7W for 90 minutes

DELRAY LIGHTING INCORPORATED

JAN 2017

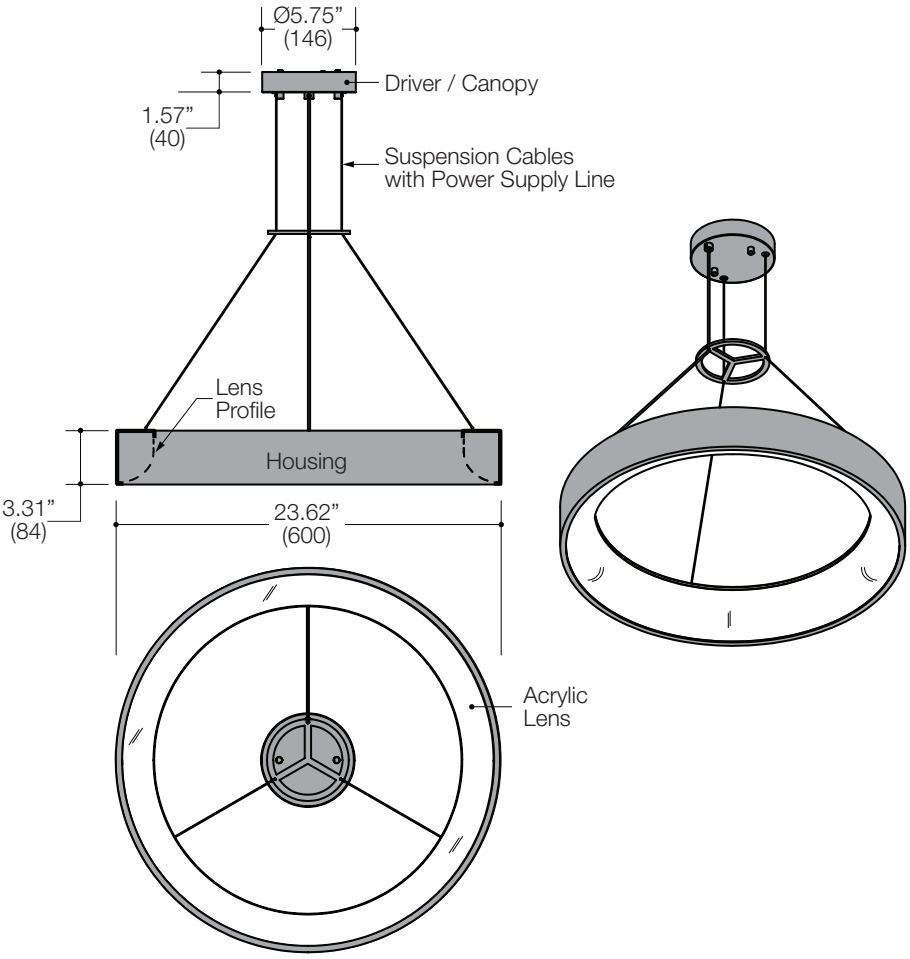
ILLUMINATION

RingLIT
CIRCULAR PENDANT

DIRECT / INDIRECT **AMBIENT** **LED**

PROJECT	TYPE	CATALOG NUMBER

Measurements in ( ) are metric equivalents.



Specifications

CONSTRUCTION
- Die formed circular LED housing
- Molded satin acrylic lens
- Spun steel canopy and driver enclosure
- Powder coat finish

LED SOURCE
- LED strip circumferentially mounted
- Direct / Indirect ambient light
- 28W / 1845lm, 90CRI / 3000K

ELECTRICAL
- Field accessible junction box wiring with power supply enclosure, access from below
- Integral thermo protection
- LED driver located in canopy

MOUNTING
- Canopy mounted directly to junction box
- Canopy, 6' aircraft cable, cable grip hardware (adjustable) and power lead

LABELS
- Suitable for damp location

5 YEAR WARRANTY
Limited

c SP us

ORDERING INFO

SERIES	WATTAGE / SIZE	CRI / COLOR	POWER SUPPLY	FINISH
RGLT **LED Pendant** **Circular Suspended** Ambient Lighting	**28L** 24" diameter 28W LED / 1845lm (@ 90CRI min / 3000K)	**9030** 90CRI / 3000K *(Other color temperatures available with special orders)*	**D2U** Dimming 0-10V Dim to Off (@ 120-277V)	**SS** Silver *(White or Black finish available with special orders)*
RGLT				

Ordering Example: **RGLT-28L-9030-D2U-SS**

HEADQUARTERS
9200 Deering Avenue
Chatsworth CA 91311

Telephone: 818-885-1335
Toll Free: 855-885-1335
Fax: 818-576-1335

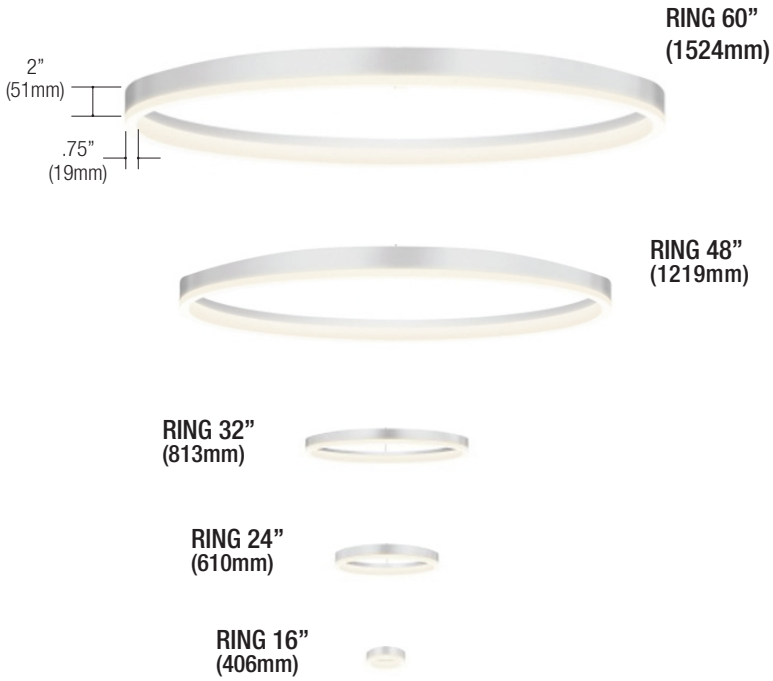
www.lfillumination.com
rev: 010219

ILLUMINATION

GlowSTX™ Series
RINGER PENDANT MOUNT
AMBIENT LED

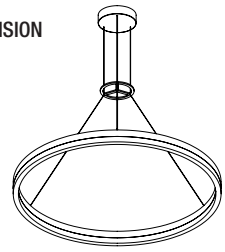
PROJECT	TYPE	CATALOG NUMBER

Measurements in ( ) are metric equivalents.

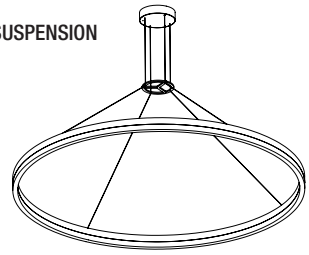


RINGER SUSPENSION

3 CABLE
CANOPY SUSPENSION
16” RING
24” RING
32” RING
48” RING



4 CABLE
CANOPY SUSPENSION
60” RING



Specifications

CONSTRUCTION
- Die formed circular steel LED housing
- Molded satin acrylic lens
- Spun steel canopy and driver enclosure
- Powder coat finish

LED SOURCE
- LED strip circumferentially mounted
- 19W / 823lm, 90CRI / 3000K - 16” Diameter
- 28W / 1419lm, 90CRI / 3000K - 24” Diameter
- 32W / 1581lm, 90CRI / 3000K - 32” Diameter
- 47W / 2337lm, 90CRI / 3000K - 48” Diameter
- 60W / 3567lm, 90CRI / 3000K - 60” Diameter

ELECTRICAL
- Field accessible junction box wiring with power supply enclosure, access from below
- Integral thermo protection
- LED driver located in Ø5” x 1.75” tall canopy

MOUNTING
- Canopy mounted directly to junction box
- Canopy, 6’ aircraft cable, cable grip hardware (adjustable) and power lead

LABELS
- Suitable for damp location

5 YEAR WARRANTY
Limited

C US

ORDERING INFO

SERIES	WATTAGE / SIZE	CRI / COLOR	POWER SUPPLY	VOLTAGE	FINISH
RINGER **GlowSTX™** **Ringer Pendant Mount** Ambient Lighting	**19L** 16” diameter 19W LED / 823lm (@ 90CRI min / 3000K)	**9030** 90CRI / 3000K *(Other color temperatures available with special orders)*	**D1** Phase Dimming* (120V only) **D2** 0-10V Dimming 120-277V * Not available in 60L - 60” Ring	**1** 120V **U** 120-277V	**SS** Silver *(White or Black finish available with special orders)*
	28L 24” diameter 28W LED / 1419lm (@ 90CRI min / 3000K)				
	32L 32” diameter 32W LED / 1581lm (@ 90CRI min / 3000K)				
	47L 48” diameter 47W LED / 2337lm (@ 90CRI min / 3000K)				
	60L 60” diameter* 60W LED / 3567lm (@ 90CRI min / 3000K)				
RINGER					

Ordering Example: **RINGER-28L-9030-D1-1-SS**

HEADQUARTERS
9200 Deering Avenue
Chatsworth CA 91311

Telephone: 818-885-1335
Toll Free: 855-885-1335
Fax: 818-576-1335

www.lfillumination.com
rev: 042319

Novato Ring - Pendant

AIP11847 36 in

SPI LIGHTING

PROJECT DETAILS

JOB NAME:

TYPE:

NOTES:

DESCRIPTION

A cornerstone of our luminous forms collection, Novato Ring is renowned for its even, three-sided illumination, versatility, and high performance. With efficacy over 100 lumens per watt delivered, it can often be the only light source required in a space, providing both the aesthetics and the performance you require. Available in a wide range of configurations, Novato Rings are well-suited for a range of environments from modern to traditional. Its luminous form is ideal for larger scale spaces including atriums, open offices, schools, and cafeterias. Hang as a pendant or cluster different sizes at varying heights to enhance any visual environment. Or create interlocking, orbit, or tiered chandeliers. Available in 2' to 10' diameters; other sizes available upon request.

designed to be LED

FEATURES & BENEFITS

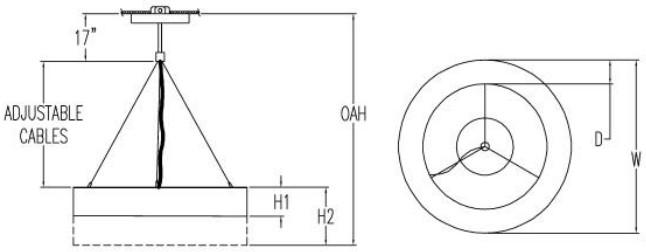
- Fully enclosed three-sided luminous form brightens horizontal and vertical planes
- Provides functional lighting with comfortable luminance levels
- Hand-fabricated construction maintains crisp, clean edges
- Diffuser available in 5” and 10” heights
- Available with metal band side walls which can be finished to add accent colors
- Choose matte opal diffuser or from four fabrics
- Specialized high-transmission diffuser offers higher delivered lumens while providing uniform illumination
- Single point mounting simplifies installation
- Mix and match with the entire Novato Family
- Handcrafted in USA

SPECIFICATIONS

- **LIGHT SOURCE:** White LED light engine
- **LUMEN MAINTENANCE:** L70 life = 50,000+ hours
- **EFFICACY:** 102 lm/W delivered
- **CCT**: 3000K, 3500K, or 4000K
- **VOLTAGE:** 120-277V standard
- **DRIVER:** Class II power supply integrated in canopy. Max distance to the driver is 15'. For extended distances, contact factory.

- **DIMMING:** 0-10V controls standard to 10% on LED light engines
- **CONSTRUCTION:** Seamless bottom and minimal lap joint(s) on inner and outer surfaces; edges are fused with solvent that permanently binds acrylic
- **FINISH:** Top plate is always white (PT01). Canopy, stem, and hub finished to match your specification. To specify separately, contact factory. Choose from more than 30 thermoset polyester powder coat paint colors. RAL®, Pantone®, or custom finishes available upon request. Metal band options are specified separately.
- **MODIFICATIONS:** Consult factory for all modification requests, including alternate mountings or 2"x2" cross-section
- **APPROVALS:** ETL listed to UL standards (US & Canada) for use in damp locations; not recommended for exterior applications

DIMENSIONS



W	H1	H2	D	OAH
36 in 91.4 cm	5 in 12.7 cm	10 in 25.4 cm	5 in 12.7 cm	54 in 137.2 cm

Mounting Weight
Approximate: 25 lb (12 kg)

CONFIGURATOR

To configure your spec sheet online, go to www.spilighting.com/AIP11847. Not all options are available in all configurations; consult factory for details.

Required Field *

Catalog	Light Source:	Primary Finish:	Voltage:	Lamp Options:	Diffuser Height:	Diffuser Finish:	Mounting:	Metal Band Options:	Other Than Standard Options:
								Finish:	
	A		B	C	D	E	F	G	H

A - LIGHT SOURCE *

To ensure color consistency, SPI uses precise bin selection and strict quality processes to maintain a 3-step (MacAdam) SDCM on all white LED lampings. Published LED luminaire wattages are calculated using a typical power supply efficiency of 88%; exact wattages may vary based on application.

☐ **L54W** | White 54W LED Light Engine | Delivered Lumens: 5,502
☐ **L108W** | White 108W LED Light Engine| Delivered Lumens: 11,004

See last page for finish options

B - VOLTAGE

☐ **120-277V** | Universal Voltage

C - LAMP OPTIONS

Delivered lumens shown are at 4000K CCT; apply multiplier for delivered lumens at other CCT.

☐ **3000K** [1] | 3000K CCT
☐ **3500K** [2] | 3500K CCT
☐ **4000K** | 4000K CCT

[1] Apply .95 multiplier for delivered lumens
[2] Apply .97 multiplier for delivered lumens

D - DIFFUSER HEIGHT *

Please choose one:

☐ **H05** | 5" Height
☐ **H10** | 10" Height


H05


H10

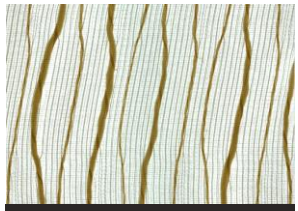
E - DIFFUSER FINISH *

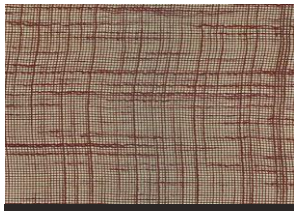
Fabrics are extruded into the acrylic and will not separate from the diffuser. They are washable. Please choose one:

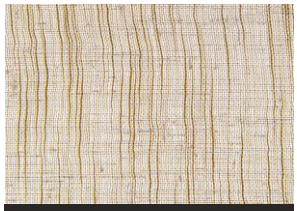
- ☐ **FB00** | Matte Opal Diffuser
- ☐ **FB01** | Fabric - Textured White Linen
- ☐ **FB02** | Fabric - Rapids
- ☐ **FB03** | Fabric - Chocolate Linen
- ☐ **FB05** | Fabric - Jute Linen

FB00


FB01


FB02


FB03


FB05

F - MOUNTING

Mounts to standard 4" octagonal junction box with auxiliary mounting holes. Power supply canopy features a 45 degree swivel and meets earthquake requirements. Fixture suspends from hub by 3 aircraft cables and includes 1 white power cord (adjustable up to OAH).

- ☐ **DF_PSS** | 12" Power Supply Canopy & Stem (default)

G - METAL BAND OPTIONS

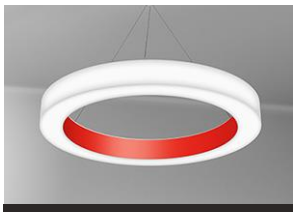
Matte Opal Acrylic (FB00) is standard with MB01 and MB02 options. Consult factory for fabric and metal band combinations.

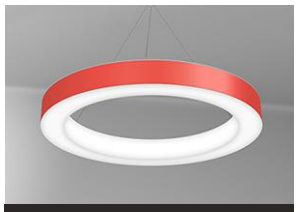
- ☐ **MB01** [3] | Metal Band Inner (See last page for finish options)
- ☐ **MB02** [4] | Metal Band Outer (See last page for finish options)
- ☐ **MB03** [5] | Metal Band Inner & Outer (See last page for finish options)

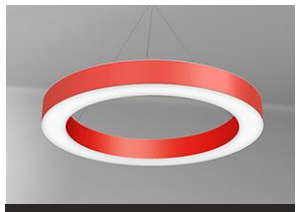
[3] Delivered lumens are 83% of luminous form output shown above

[4] Delivered lumens are 64% of luminous form output shown above

[5] Delivered lumens are 53% of luminous form output shown above. To specify different finishes for the inner and outer metal bands, consult factory.


MB01


MB02


MB03

H - OTHER THAN STANDARD OPTIONS

Specify overall height required from ceiling to the bottom of the fixture. Finished ceiling to bottom of the hub is constant at 17" regardless of OAH. Minimum adjustable cable length is half of fixture width (W).

OAH | Pendant suspension length other than standard Length:

Available Finishes

Not all finishes are available in all configurations; consult factory for details.

Paint Colors

PT01 Super White	**PT02** White	**PT03** Morning Light	**PT04** Warm White	**PT05** Putty
PT06 Warm Beige	**PT07** Light Taupe	**PT08** Medium Taupe	**PT09** Medium Grey	**PT10** Dark Grey
PT11 Black	**PT12** Dark Chocolate	**PT13** Warm Grey	**PT14** Light Grey	**PT15** Sage
PT16 Spruce	**PT17** Red	**PT18** Deep Red	**PT19** Blue	**PT20** Dark Green
PT21 Pearl White (Metallic)	**PT22** Platinum (Metallic)	**PT27** Deep Copper (Metallic)	**PT28** Dark Stainless (Metallic)	**PT29** Red Brass (Metallic)
PT31 Medium Bronze (Metallic)	**PT32** Dark Bronze (Metallic)	**PT33** Dark Blue	**PT40** Yellow	**PT41** Orange
PT42 Sky Blue	**PT43** Teal	**PT44** Green	**PT45** Purple	**PT46** Aluminum (Metallic)
PT47 Deep Red Brass (Metallic)	**PT48** Brass (Metallic)	**PT49** Bronze (Metallic)	**PT51** Matte White	

BOBRICK

Technical Data

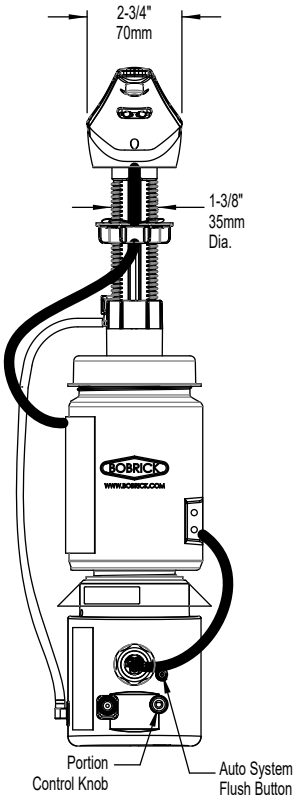
Designer Series™ COUNTER-MOUNTED AUTOMATIC FOAM SOAP DISPENSER

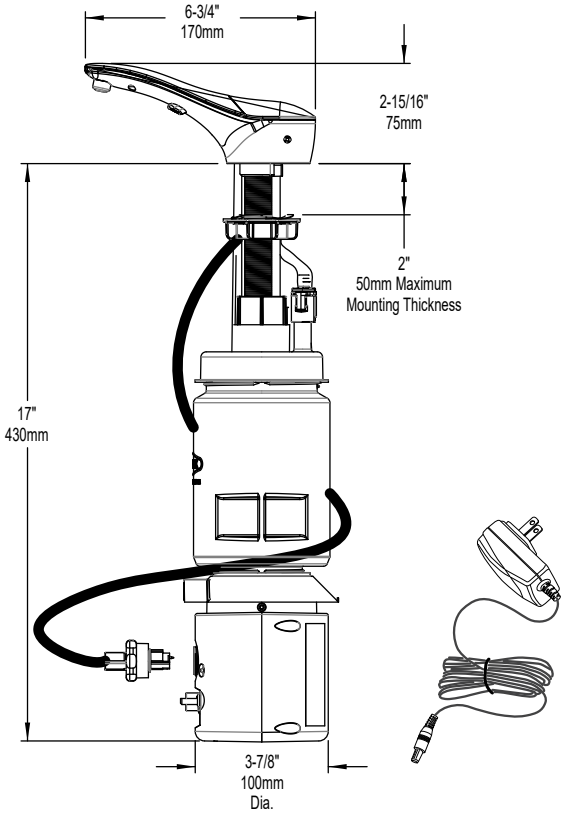
B-84_ SERIES

Specify Finish Required:

- ❑ B-840 Polished Brass
- ❑ B-842 Matte Black
- ❑ B-845 Brushed Nickel
- ❑ B-846 Polished Nickel
- ❑ B-848 Polished Chrome

Patented





MATERIALS:

Spout and Stem Assembly — Above the counter - durable die cast zinc, available in five finishes:

Finish Type	Foam
Polished Brass	B-840
Matte Black	B-842
Brushed Nickel	B-845
Polished Nickel	B-846
Polished Chrome	B-848

Unit equipped with a spring loaded 180° rotatable lid with concealed locking mechanism for top filling. Rotatable lid mechanism consists of metal components. Integrated to Spout are a grey plastic Dispense Tip and Activation Lens Housing. Delrin Stem connects to Plastic Bottle.

Foam Mixer Cartridge — Located inside grey nozzle tip, mixer cartridge has an integrated nylon mesh and nozzle tip is removable for mixer cartridge cleaning and maintenance.

Air Pump — Diaphragm operated electronic air pump connects to the air tube adapter and supplies air to the Foam Mixer Housing.

continued . . .

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Foam Mixer Housing — Plastic construction connects air tube and soap outlet into a mixing chamber to create a preliminary mixture of foam.

Soap Bottle — Translucent, shatter-resistant high-density polyethylene. Capacity: 34-fl oz (1.0-L).

Pump and Soap Delivery System — A plastic Gear Pump submerged in the bottom of the Bottle, pumps the foam soap through a vinyl tube to spout.

Bottom Housing — Water-resistant, ABS plastic housing attached to the bottom of the Bottle houses the PC Board, motor that drives the Gear Pump, and the Gear Pump Housing. It includes a Portion Control Knob, Flush Button to allow for system cleaning and maintenance, a connector for the Fiber Optic cables, and Power Port.

Electronic Activation/Indication System — Pair of plastic Fiber Optic cables connects the plastic Activation Lenses to an IR Sensor located on a PC Board in the Bottom Housing. A third plastic Fiber Optic cable connects an LED located on the PC Board to an acrylic Lens at the tip of the Spout. All three cables are Integrated into one Fiber Optic Connector Tip for ease of installation.

6V AC Adapter — 6V AC Adapter with U.S. Plug comes standard.

OPERATION:

To fill dispenser, insert tip of standard BobKey provided into opening of the concealed locking mechanism in the Spout Assembly with spout body to disengage door for quick and easy top filling. Lid will rotate open for filling dispenser with bulk **foam** hand soap only. Rotate door counter-clockwise to close and lock in place.

Spout will dispense foam that is generated by mixing air and foam soap. The texture of the foam can be adjusted by rotating the control dial. The texture may vary depending on the type of soap used.

LED Lights
Flash Green → Standby mode
No Light → During activation
Flash Red → Object remains in activation zone after single activation

Designers Note: Bobrick foam soap dispensers are designed to dispense commercially marketed all purpose foam hand soaps and antibacterial foam soaps that are not alcohol or iodine based. Acceptable foam soaps need to have a viscosity of less than 100cPc (centipoise).

INSTALLATION:

Unit is designed for installation into counters up to 2" (50mm) maximum thickness with 1-3/8" (35mm) diameter mounting hole. Unit may be mounted through special hole requisitioned when lavatory is ordered from manufacturer (specify hole location). Recommended mounting location is between 6" to 8" (150 to 205mm) from back wall and 3" (75mm) from the sink rim to the center of the mounting hole. Minimum 18" (455mm) vertical and 5" (125mm) diameter clearance required for soap bottle and bottom housing below mounting hole. Plug AC Adapter into wall and end plug into power port on bottom housing.

Designers Note: Unit is not compatible with above the counter sink rims greater than 1-1/2" W x 1" H (25 x 40mm) or 2-1/2" W x 1/2" H (65 x 12.7mm). **Caution:** Sink rim must not come into contact with activation area. For more information refer to Form No. 824-307 Mounting Template in the Installation Instructions.

SPECIFICATIONS:

Designer Series Counter-Mounted Automatic Foam Soap Dispenser shall dispense commercially marketed all-purpose bulk foam hand soaps, do not use iodine based or alcohol based soaps or sanitizers. Spout assembly shall be die cast zinc, with one of five finishes. Stem is integrated with spout and shall be Delrin plastic and accommodate up to 2" (50mm) thick counter tops. Unit shall be equipped with oversized funnel shape opening, covered by a 180° rotatable lid with concealed locking mechanism to allow for top filling. Unit shall have LED indicators to show unit is ready for activation. Unit shall have IR Sensor located on PC board housed in a water-resistant plastic housing. Activation Lens shall allow for defined activation range to eliminate chance of false activation during hand washing. Unit equipped with unique two stage foam mixing chambers. Air pump delivers air to foam mixer housing, combining foam soap solution and air to form a preliminary mixture of foam. Soap is then pumped through spout where a second chamber in the nozzle tip houses a mixer cartridge with nylon mesh which delivers a rich lather of foam soap. Control Dial shall allow field adjustment of foam texture. Unit shall be equipped with an Automatic System Flush Button to allow for cleaning and maintenance. Comes with 6V AC adapter.

Designer Series Counter-Mounted Automatic Foam Soap Dispenser shall be _____ (insert model number) of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

Revised 11/3/20 Printed in U.S.A.

LITHONIA LIGHTING®

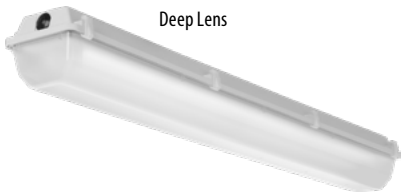
Catalog Number	
Notes	
Type	

Low-Profile Enclosed and Gasketed Industrial

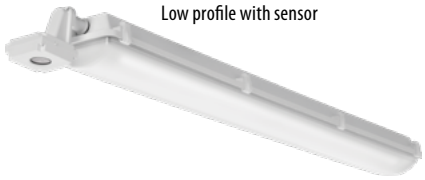
FEM LED

CEILING/ SUSPENDED MOUNT

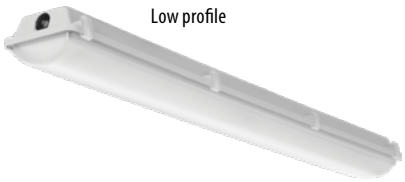
Deep Lens



Low profile with sensor



Low profile



FEATURES & SPECIFICATIONS

INTENDED USE — A general purpose and energy-efficient surface-mounted or suspended LED fixture, suitable for wet, damp and/or cold locations. For vapor-tight demanding environments where moisture or dust is a concern and where relatively low fixture mounting heights and wide fixture spacing are common. Typical applications include industrial facilities, parking garages, retail malls, multi-purpose rooms, garden centers, and food processing. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate.** **Click here for Acrylic-Polycarbonate Compatibility table for suitable use.**

Certain airborne contaminants may adversely affect the functioning of LEDs and other electronic components, depending on various factors such as concentrations of the contaminants, ventilation, and temperature at the end-user location. **Click here for a list of substances that may not be suitable for interaction with LEDs and other electronic components.**

CONSTRUCTION — One-piece 5VA fiberglass housing with integral perimeter channel utilizing continuous poured-in-place NEMA 4X gasket. Approved as a wireway and for through wiring. Captive polymeric latches are standard. Stainless steel latches (#316) available as an option for food processing or more demanding applications.

Power connection is easily accomplished through pre-drilled holes. Fixture easily mounts to ceilings and other solid structures, or can be suspended with chain, cable or rod using stainless steel mounting brackets (included).

OPTICS — Injection molded, acrylic lens (.080" thick) provides high impact-resistance comparable to 100% DR. For L48 Medium Distribution, a UV stabilized polycarbonate diffuser is available (.080" thick) in clear or frosted for additional impact strength where vandal protection is desired.

Expected service life of 60,000 hours at 80% lumen maintenance (L80); predicted life of more than 100,000 hours.

ELECTRICAL — Utilizes high-efficiency LEDs mounted to core circuit boards. High-efficiency drivers operate 120 thru 277V, 347V and 480V offered with 0-10 volt dimming, allowing granular control when coupled with wireless networking controls. Luminaire Surge Protection Level: Designed to withstand up to 6kV/3kA per ANSI C82.77-5-2015.

INSTALLATION — Fixture can be ceiling or suspended mounted. Pre-punched stainless steel mounting brackets are included (two per luminaire) for easy field-attachment of bolts, screws and other mounting hardware. A covered ceiling is not required to maintain wet location listing or IP rating.

LISTINGS — CSA certified to UL and C-UL standards. Listed for wet locations in ambient temps ranging from -35°C (-31°F) to 25°C (77°F) when fixture is surface mounted or up to 45°C (113°F) when fixture is suspended at least 6" from ceiling. IP65, IP66 and IP67 rated. NSF splash-zone 2 certified and meets FDA/USDA guidelines. Nema 4X rated lens and housing. 1500 PSI hose-down. DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY — 5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

NOTE: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Stock configurations are offered for shorter lead times:

Standard Part Number	Stock Part Number
FEM L48 4000LM LPAFL MD MVOLT GZ10 40K 80CRI	**FEM L48 4L MVOLT**
FEM L48 4000LM LPAFL MD MVOLT GZ10 50K 80CRI	**FEM L48 4L MVOLT 5K**

A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® or XPoint™ Wireless control networks marked by a shaded background*

To learn more about A+, visit www.acuitybrands.com/aplus.

*See ordering tree for details

FEM LED Low-Profile Enclosed and Gasketed

A+ Capable options indicated by this color background.

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: FEM L48 4000LM IMAFL WD MVOLT GZ10 40K 80CRI

Series	Length	Nominal Lumens	Diffuser	Distribution	Voltage	Driver	Color temperature	CRI
FEM	L48 48" [1]	3000LM 3,000 lumens 4000LM 4,000 lumens 6000LM 6,000 lumens 8000LM 8,000 lumens 10000LM 10,000 lumens	IMAFL Acrylic, lineal ribbed frosted lens IMACD Acrylic, clear deep lens IMAFD Acrylic, deep frosted lens LPAFL Acrylic, low profile frosted lens[3] LPACL Acrylic, low profile clear lens[3] LPPCL Polycarbonate, low profile clear lens[3] LPPFL Polycarbonate, low profile frosted lens[3]	MD Medium WD Wide [4]	MVOLT MVOLT 120 120V 277 277V 347 347V[5] 480 480V[5]	GZ10 0 - 10V dimming	30K 3000K 35K 3500K 40K 4000K 50K 5000K	80CRI 80 CRI 90CRI 90 CRI
	L96 96" [2]	9000LM 9,000 lumens 12000LM 12,000 lumens 15000LM 15,000 lumens 18000LM 18,000 lumens 20000LM 20,000 lumens						

Options

SF	Single fuse (available with 120, 277, 347)[6]
DF	Double Fusing (available with 347, 480V)[6]
BSL520	Bodine® emergency LED battery pack for -20°C and up. CA Title 20 Noncompliant[7,8]
E15WCP	Emergency battery pack, 15W constant power, Certified in CA Title 20 MAEDBS[6,7,9]
BGTD	Generator transfer device[6,10]
SPD	Surge protection device, additional 10kV/5kA[6]
WLF	Wet location fitting (two outboard, top)
WLFEND	Wet location fitting (one end)
WLFEND2	Wet location fitting (both ends)[11]
CS88	6' Brad Harrison 16/3 cord and straight blade plug set[6]
CS88L12	12' Brad Harrison 16/3 cord and straight blade plug set[6]
CS88R	Brad Harrison receptacle
CS89	6' white cord, 16/3, no plug, wet location
CS89L12	12' white cord, 16/3, no plug, wet location
TRS	Tamper Resistant Torx® T10 screws
DPMB	Dual pendant mounting bracket
STSL	Stainless steel latches

Individual Controls: [12]

MSI10NWL	Low mount 360° integral motion sensor, wet location, On/Off operation[6]
MSI102L3VWL	Low mount 360° integral motion sensor, wet location, High/Low operation (bi-level)[6]
MSI10NWL DSCNWL	Low mount 360° integral motion sensor, wet location, On/Off operation for motion sensing, override Off due to daylight[6]

Xpoint Wireless: [12]

MSI10XAWL DSCXAWL	Xpoint wireless integral motion sensor, On/Off operation for motion sensing, override Off due to daylight[6]
XAD	XPoint™ wireless controller, 0-10V dimming[6]

nLight Air:

NLTAIR2 RSBOR10	nLight AIR generation 2 enabled 306 low mount motion sensor [12]

Accessories: *Order as separate catalog number.*

MHCH 36	Jack chain 36" (pair)
MHHK120	10' single leg air craft cable (ships as pair)
MHHK120SS	10' single leg air craft cable, stainless steel (ships as pair)
RK1 T10BIT W/PIN U	Hex-base driver bit, Torx TX10, for tamper resistant screws with center reject pin
FEMDPMB	Dual pendant mounting bracket (ships as a pair)

Notes

1 Available with 3000LM, 4000LM, 6000LM, 8000LM, and 10000LM lumen packages. Not available with WD when using low profile diffuser.

2 Available with 9000LM, 12000LM, 15000LM, 18000LM, and 20000LM. Not available with low profile diffuser options.

3 Not available with L96. Not available with L48 when ordering WD option.

4 Not availabe with L48 when ordering low-profile lens options.

5 Utilizes step-down transformer. Not available with BGTD.

6 Must specify voltage.

7 Not available with 347 or 480V.

8 For use with ambient temperatures no lower than -20°C.

9 For use in ambient temperatures no lower than -17°C.

10 Available with 120V or 277V only. For use in ambient environments up to 25C. Not available with L48 when ordering 10000LM lumen package. Not available with L96 when ordering 18000LM or 20000LM lumen packages.

11 Not available with Sensor options or cord sets, or MSI controls.

12 Not available with multiple control options - other MSE or Xpoint.

OPERATIONAL DATA

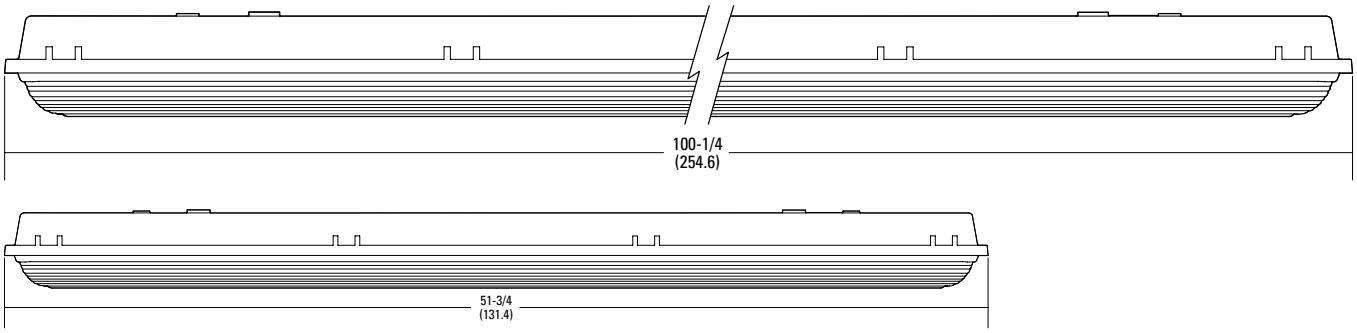
		Lumen packages	Wattage				Diffusers		
			120v	277v	347v	480v	Acrylic Lineal Frosted (IMAFL)	Frosted (IMAFD, LPAFL, LPPFL)	Clear (IMACD, LPACL, LPPCL)
L48 Medium Distribution *test results reflect less than 1% difference between acrylic (clear/deep/low profile) and polycarbonate (low profile) lens	**Delivered Lumens at 30K 80CRI**	3000LM	23	23	24	25	2972	3032	3071
		4000LM	31	30	31	32	4019	4100	4153
		6000LM	45	44	46	47	5925	6044	6122
		8000LM	69	67	70	71	7593	7746	7845
		10000LM	80	78	81	82	9781	9979	10107
	Delivered Lumens at 35K 80CRI	3000LM	23	23	24	25	3039	3100	3140
		4000LM	31	30	31	32	4109	4192	4246
		6000LM	45	44	46	47	6057	6179	6258
		8000LM	69	67	70	71	7762	7918	8020
		10000LM	80	78	81	82	9999	10201	10332
	Delivered Lumens at 40K 80CRI	3000LM	23	23	24	25	3086	3148	3189
		4000LM	31	30	31	32	4173	4257	4312
		6000LM	45	44	46	47	6151	6275	6356
		8000LM	69	67	70	71	7883	8042	8145
		10000LM	80	78	81	82	10155	10360	10493
	Delivered Lumens at 50K 80CRI	3000LM	23	23	24	25	3200	3264	3306
		4000LM	31	30	31	32	4326	4414	4470
		6000LM	45	44	46	47	6378	6506	6590
		8000LM	69	67	70	71	8173	8338	8445
		10000LM	80	78	81	82	10529	10741	10879

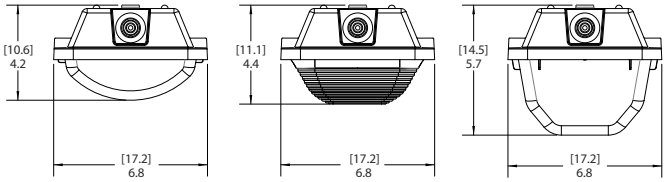
		Lumen packages	Wattage				Diffusers		
			120v	277v	347v	480v	Acrylic Lineal Frosted (IMAFL)	Acrylic Frosted (IMAFD)	Acrylic Clear (IMACD)
L96 Medium Distribution	**Delivered Lumens at 30K 80CRI**	9000LM	65	64	66	67	8718	8959	9072
		12000LM	88	86	89	90	11370	11685	11831
		15000LM	120	118	122	124	14263	14657	14841
		18000LM	145	141	146	148	16863	17330	17547
		20000LM	160	156	162	164	19313	19847	20096
	Delivered Lumens at 35K 80CRI	9000LM	65	64	66	67	8913	9159	9274
		12000LM	88	86	89	90	11624	11945	12095
		15000LM	120	118	122	124	14581	14984	15172
		18000LM	145	141	146	148	17239	17716	17938
		20000LM	160	156	162	164	19743	20289	20544
	Delivered Lumens at 40K 80CRI	9000LM	65	64	66	67	9051	9302	9419
		12000LM	88	86	89	90	11805	12131	12284
		15000LM	120	118	122	124	14808	15218	15409
		18000LM	145	141	146	148	17507	17992	18218
		20000LM	160	156	162	164	20051	20605	20864
	Delivered Lumens at 50K 80CRI	9000LM	65	64	66	67	9385	9644	9765
		12000LM	88	86	89	90	12239	12578	12736
		15000LM	120	118	122	124	15353	15778	15976
		18000LM	145	141	146	148	18152	18654	18888
		20000LM	160	156	162	164	20789	21364	21632

DIMENSIONS

Specifications subject to change without notice.
All dimensions are inches (centimeters) unless otherwise indicated.

Weight (may vary with options or accessories)
FEM L48: 11.9 lbs (5.397kg)
FEM L96: 24.3 lbs (11.022kg)





Diffuser Type:
LPAFL
LPACL
LPPFL
LPPCL

Diffuser Type:
IMAFL

Diffuser Type:
IMAFD
IMACD

PHOTOMETRICS

See www.lithonia.com for photometry reports.