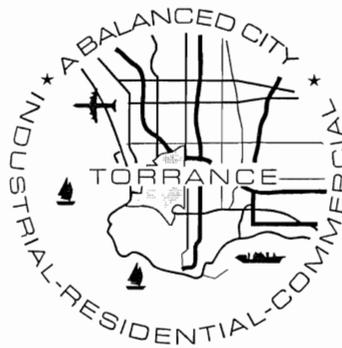


**PROJECT MANUAL FOR EL RETIRO AND SOUTHEAST LIBRARY
ACCESSIBILITY UPGRADES
B 2013-37**



May 2013

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PART A

NOTICE INVITING BIDS

**CITY OF TORRANCE
CALIFORNIA**

NOTICE INVITING BIDS

Notice is hereby given that sealed proposals for performing the following described work will be received at the office of the City Clerk of the City of Torrance, California, until **2:00 p.m. on Thursday, July 18, 2013** after which time they will be publicly opened and read at 2:15 p.m. in the Council Chambers of said City:

**Bid for El Retiro and Southeast Library Accessibility Upgrades
B2013-37**

Plans, Bid Proposal, and Specifications are available for viewing and printing from the City's website at <http://www.torranceca.gov/25079.htm>.

There will be a mandatory pre-bid conference held on Thursday, June 20, 2013 at 10:00 a.m. commencing at Southeast Library 23115, Arlington Avenue, Torrance, CA 90501. The City of Torrance will consider the bidder as non-responsive if the bidder does not attend the mandatory pre-bid conference. **Addenda will be issued only by email and only to those attended the mandatory pre-bid conference.** All addenda must be acknowledged. Failure to acknowledge addenda on the bid forms provided may render the proposal non-responsive and cause it to be rejected.

An official bid proposal packet, which includes: bid proposal forms, and a bound Specifications booklet may be obtained at the Office of the City Clerk (310) 618-2870, \$25 if picked up at City Hall, or payment of \$35 if requested by mail. Both amounts include tax. Neither amount is refundable. A prospective bidder must provide to the City Clerk's office, the firm's name, address, telephone and fax number, a contact person and a valid email address.

If requesting any item(s) by mail, please send check to the following:

**CITY OF TORRANCE
OFFICE OF THE CITY CLERK
3031 TORRANCE BLVD
TORRANCE, CA 90503-2970
ATTN: B2013-37**

The work for both sites shall be completed within one hundred fifty (150) calendar days of receipt of the Notice to Proceed (NTP). Onsite work for El Retiro Library will be no more than sixty (60) calendar days. Onsite work for Southeast Library will be no more than sixty (60) calendar days.

The engineer's estimate is between \$100,000 to \$115,000 for El Retiro Library. The engineer's estimate is between \$150,000 to \$165,000 for Southeast Library. Bids are required for the entire work described herein.

The City has determined the bidder must have a valid "B" General Contracting License. Bidder must have at least five (5) years experience in public works projects of a similar size and scope.

Per Division 2, Chapter 2 of the Torrance Municipal Code, the Torrance City Council may reject any and all bids, waive any informality or irregularity in such bids, and determine the lowest responsible bidder.

No Facsimile Bids shall be accepted by the City.

Project is not subject to prevailing wage rates.

By order of the City Council of the City of Torrance, California.

Bidders with pre-bid inquiries should contact Diane Megerdichian, Business Manager, General Services Department at 310-781-7151 or email dmegerdichian@torranceca.gov. If emailing questions, please put project title in the subject line.

PART B
INSTRUCTIONS TO BIDDERS

**CITY OF TORRANCE
CALIFORNIA**

INSTRUCTIONS TO BIDDERS

A. QUALIFICATION OF BIDDERS

1. Competency of Bidders

The Bidder shall be thoroughly competent and capable of satisfactorily performing the Work covered by the Bid. As specified in the Bid Documents, the Bidder shall furnish statements of previous experience on similar work. When requested, the Bidder shall also furnish a plan of procedure proposed; organization, machinery, plant and other equipment available for the Work; evidence of financial condition and resources; and any other documentation as may be required by the City to determine if the Bidder is responsible.

2. Contractor's License

At the time of submitting the Bid, the Bidder shall be licensed as a contractor in accordance with the provisions of Chapter 9, Division 3, of the California Business and Professions Code. The required prime contractor license class for the Work is shown in the project Notice Inviting Bids. However, the City reserves the right to award the Contract to a contractor with another class if the City determines that the license is proper for the work.

B. BIDDER RESPONSIBILITY

A responsible Bidder is a Bidder who has demonstrated the attribute of trustworthiness, as well as ability, fitness, capacity and experience to satisfactorily perform the work.

Bidders are notified that, in accordance with Division 2, Chapter 2 of the Torrance Municipal Code, the City Council may determine whether the Bidder is responsible based on a review of the Bidder's performance on other contracts.

If, based on the provision and criteria in Division 2, Chapter 2 of the Torrance Municipal Code, the General Services Director proposes not to recommend the award of contract to the apparent low bidder, the Director shall notify the Bidder in writing of its intention to recommend to the City Council that the Council award the contract to the next lowest responsible bidder. If the Bidder presents evidence in rebuttal to the recommendation, the Director shall evaluate the merits of such evidence, and based on that evaluation, make a recommendation to the City Council.

C. ADDENDA TO THE CONTRACT DOCUMENTS

The City reserves the right to revise or amend these specifications prior to the date set for opening bids. Revisions and amendments, if any, will be announced by an addendum to this bid. If the revisions require additional time to enable Bidders to respond, the City may postpone the opening date accordingly. In such case, the addendum will include an announcement of the new opening date.

All addenda must be attached to the bid. Failure to attach any addendum may render the bid non-responsive and cause it to be rejected.

D. PREPARATION OF THE BID

1. Examination of Site, Plans and Specifications

Bidders shall examine the site of the work and acquaint themselves with all conditions affecting the work. By submitting a bid, the bidder shall be held to have personally examined the site and the drawings, to have carefully read the specifications, and to have satisfied itself as to its ability to meet all the difficulties attending the execution of the proposed contract before the delivery of this proposal, and agrees that if awarded the contract, will make no claim against the City based on ignorance or misunderstanding of the plans, specifications, site conditions and/or contract provisions.

The Contractor shall have included in the contract price a sufficient sum to cover all items, including labor, materials, tools, equipment and incidentals, that are implied or required for the complete improvements as contemplated by the drawings, specifications, and other contract documents.

2. Bid Instructions and Submissions

The Bid shall be submitted on the Bid Proposal forms included in the Specifications. All Bid Documents must be completed, executed and submitted with Bid by Bidder. Required seven (7) Bid Proposal Documents:

1. Bidder's Proposal
2. Addenda Acknowledgment
3. Contractor's Affidavit
4. Bid Bond (10% of Bid)
5. List of Subcontractors
6. Bidder's References/Experience
7. Bidder's Information (2 pages)

All prices submitted will be considered as including any and all sales or use taxes.

E. BID FORM/BOND

The Bid must be accompanied by cash, a certified or cashier's check, or a surety bond (bid bond) payable to the City of Torrance. Bids must be submitted on the proposal forms furnished by the City Clerk's office. The Bid Guaranty shall be in an amount equivalent to at least 10% of the Total Contract Bid Price.

Within ten (10) days after the award of the contract, the City Clerk will return the proposal guarantees accompanying those proposals, which are not to be considered in making the award. All other proposal guarantees will be held until the contract has been finally executed, after which they will be returned to the respective bidders whose proposals they accompany.

F. AFFIDAVIT.

An affidavit form is enclosed. It must be completed signifying that the bid is genuine and not collusive or made in the interest or on behalf of any person not named in the bid, that the bid has not directly or indirectly induced or solicited any other Bidder to put in a sham bid or any other person, firm, or corporation to refrain from bidding, and that the Bidder has not in any manner sought by collusion to secure for itself an advantage over any other Bidder. Any bid submitted without an affidavit or in violation of this requirement will be rejected.

G. NONRESPONSIVE BIDS AND BID REJECTION

1. A Bid in which any one (1) of the required eight (8) Bid proposal documents are not completed, executed and submitted may be considered non-responsive and be rejected.
2. A Bid in which the Contract Unit Prices are unbalanced, which is incomplete or which shows alteration of form or irregularities of any kind, or which contains any additions or conditional or alternate Bids that are not called for, may be considered non-responsive and be rejected.

H. AWARD OF CONTRACT

In accordance with Division 2, Chapter 2 of the Torrance Municipal Code, the City Council reserves the right to reject any and all bids received, to take all bids under advisement for a period not-to-exceed sixty (60) days after date of opening thereof, to waive any informality or irregularity in the Bid, and to be the sole judge of the merits of material included in the respective bids received. This bid does not commit the City to award a contract or to pay any cost incurred in the preparation of a bid. All responses to this bid become the property of the City of Torrance.

I. EXECUTION OF CONTRACT

After the Contract is awarded, the awarded bidder shall execute the following five (5) documents:

1. Performance Bond (100% of Bid)
2. Labor and Material Bond (100% of Bid)
3. Contract - Public Works Agreement
4. Verification of Insurance and Workers Compensation Coverage (Certificates and Endorsements)
5. Business License Application Form

J. PERMITS, LICENSES AND PUBLIC WORKS AGREEMENT

The Contractor shall procure and execute all permits, licenses, pay all charges and fees, and give all notices necessary and incidental to completion of Work. The Contractor shall execute a Public Works Agreement. No fee is charged for a permits issued by the City of Torrance Building and Safety Department for a public works project. The Contractor shall obtain a City of Torrance Business License. To obtain a Torrance Business License please call 310-618-5923.

K. INSURANCE

The Contractor shall maintain Automobile Liability, General Liability and Workers' Compensation Insurance as specified in the Public Works Agreement included in the Project Specifications.

L. SUBCONTRACTS

Each Bidder shall comply with the Chapter of the Public Contract Code including sections 4100 through 4113. The Contractor shall perform, with its own organization, Contract work amounting to at least 50 percent of the Contract price. When a portion of an item is subcontracted, the value of the work subcontracted will be based on the estimated percentage of the Contract Unit Price, determined from information submitted by the Contractor, subject to approval by the City Manager.

M. TRAFFIC CONTROL PLAN

Not applicable

N. PRE-BID INQUIRIES

Bidders with pre-bid inquiries should contact Diane Megerdichian, Business Manager, General Services Department at 310-781-7151 or email dmegerdichian@torranceca.gov. If emailing, please put project title in the subject line.

DO NOT RETURN PLANS AND SPECIFICATIONS.

ALL BIDS MUST BE SEALED AND MARKED:

"BID FOR EL RETIRO AND SOUTHEAST LIBRARY
ACCESSIBILITY UPGRADES B2013-37

O. EXECUTION OF CONTRACT

1. The contract shall be signed by the successful bidder and returned, together with the contract bonds and evidence of required insurance coverage, **within ten (10) working days**, not including Sundays, after the bidder has received notice that the contract has been awarded. Failure to execute the contract as specified above shall be just cause for annulment of the award and forfeiture of the proposal guarantee. The Contract shall not be considered binding upon the CITY until executed by the authorized CITY officials.

2. Bond amounts shall be as provided in Section 2-4 of the Standard Specifications for Public Works Construction. The Performance Bond shall be required to remain in effect for one (1) year following the date specified in the City's Notice of Completion, or, if no Notice of Completion is recorded for one (1) year following the date of final acceptance by the City Manager.

P. INSURANCE REQUIREMENTS FOR CONTRACTORS.

CONTRACTOR must maintain at its sole expense the following insurance, which will be full coverage not subject to self insurance provisions:

1. Automobile Liability, including owned, non-owned and hired vehicles, with at least the following limits of liability:
 - a. Primary Bodily Injury with limits of at least \$500,000 per person, \$1,000,000 per occurrence; and
 - b. Primary Property Damage of at least \$250,000 per occurrence; or
 - c. Combined single limits of \$1,000,000 per occurrence.
2. General Liability including coverage for premises, products and completed operations, independent contractors, personal injury and contractual obligations with combined single limits of coverage of at least \$ 2,000,000 per occurrence.
3. Workers' Compensation with limits as required by the State of California and Employers Liability with limits of at least \$1,000,000.

Q. The insurance provided by CONTRACTOR will be primary and non-contributory.

R. The CITY ("City of Torrance"), the Successor Agency to the former Redevelopment Agency of the City of Torrance, the City Council and each member thereof, members of boards and commissions, every officer, agent, official, employee and volunteer must be named as additional insured under the automobile and general liability policies.

S. CONTRACTOR must provide certificates of insurance and/or endorsements to the City Clerk of the City of Torrance before the commencement of work.

T. Each insurance policy required by this Paragraph must contain a provision that no termination, cancellation or change of coverage can be made without thirty days notice to the CITY.

U. CONTRACTOR must include all subcontractors as insured under its policies or must furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors will be subject to all of the requirements of this Paragraph 17.

4. Sufficiency of Insurers and Sureties:
Insurance required by this contract will be satisfactory only if issued by companies rated "B+" or better in the most recent edition of Best's Key Rating Guide, and only if they are of a financial category of a VII or better, unless these requirements are modified or waived by the City Risk Manager.

W. RESPONSIBILITY OF CITY.

The City of Torrance shall not be held responsible for the care or protection of any material or parts of the work prior to final acceptance, except as expressly provided in these specifications.

X. CONSTRUCTION SCHEDULE AND PRECONSTRUCTION CONFERENCE.

The office staff of the City is currently operating on a 9/80 work week; therefore, City Hall is closed every other Friday.

In accordance with the herein Special Provisions, after notification of award and prior to start of any work, **the Contractor shall submit to the City Manager for approval its proposed Construction Schedule within ten (10) working days from the date of Notice of Proceed.** At least two (2) days, exclusive of Saturdays, Sundays and holidays, prior to commencement of work, the Contractor shall attend a pre-construction conference.

The Contractor will provide all product and equipment submittals to the City of Torrance or designated consultant within ten (10) working days from the date of Notice to Proceed. The Contractor shall immediately order materials requiring a delivery delay upon receipt of a written notice from the City that the City Council has approved an Award of Contract. Contractor shall provide written proof(s) of timely material order(s) and shall include any delivery delays in the Construction Schedule.

Y. PROGRESS OF THE WORK AND TIME FOR COMPLETION

The Contractor shall begin work after the mailing, from the City Manager to the Contractor, by first class mail, postage prepaid, of a Notice to Proceed. **The Contractor shall diligently prosecute the same to completion within one hundred fifty (150) calendar days of the start date specified in said Notice.** The one hundred eighty calendar day schedule includes, completion of contractual paper work, equipment/material submittal review, the lead time for materials and equipment, and on site work. Onsite work for El Retiro Library will be no more than sixty (60) calendar days. Onsite work for Southeast Library will be no more than sixty (60) calendar days.

During periods when weather or other conditions are unfavorable for construction, the Contractor shall pursue only such portions of the work as shall not be damaged thereby. No portions of the work whose acceptable quality or efficiency will be affected by any unfavorable conditions shall be constructed while those conditions exist. It is expressly understood and agreed by and between the Contractor and the City that the Contract time for completion of the work described herein is a reasonable time taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work.

Z. LIQUIDATED DAMAGES

The Contractor agrees that failure to complete work within the time allowed will result in damages being sustained by the City. Contractor and City agree that failure to complete the project will result in inconvenience to the citizens of Torrance and the City of Torrance and their customers using the affected areas. Such delay will also result in the necessity of several inspections each day to ensure that the project is properly progressing. The parties also agree that failure to complete the project on time will prevent the City from having the use of the facility. Therefore, the parties agree such damages among others are, and will continue to be, impracticable and extremely difficult to determine, but that Seven Hundred and Fifty Dollars (\$750) a calendar day is the minimum value of such costs to the City and is a reasonable amount that the Contractor agrees to reimburse the City for each calendar day of delay in finishing the work in excess of the time specified for completion, plus any authorized time extensions.

Execution of the contract under these specifications shall constitute agreement by the Contractor and the City that Seven Hundred and Fifty Dollars (\$750) per calendar day is the minimum value of the costs and actual damage caused by failure of the Contractor to complete the work within the allotted time, that such sum is liquidated damages and shall not be construed as a penalty, and that such sum may be deducted from payments due the Contractor if such delay occurs. Said amount may be reduced by the City if work is sufficiently completed within the allotted time so that the damages are minimized.

The Contractor will not be assessed liquidated damages for any delay in completion of the work when such delay was caused by the failure of the City or the owner of a utility to provide for removal or relocation of the existing utility facilities; provided, however, that the Contractor shall have given the City and the owner of a utility timely notice of the interference. "Timely notice" shall be defined as a verbal notice (to be followed up in writing) no later than one (1) hour after initial discovery of the interference unless the City Representative is present, in which case notice shall be given immediately in writing to the City Manager.

AA. GENERAL PREVAILING WAGE RATE- Not applicable

BB. PRELIMINARY NOTICES

Preliminary Notices should be mailed to the following address.

Diane Megerdichian
General Services Department
3350 Civic Center Drive
Torrance, CA 90503

PART C

SPECIAL PROVISIONS

SECTION A. GENERAL

The Project Specifications for all work on this project are the specifications contained in the “**Project Manual for El Retiro and Southeast Library Accessibility Upgrades**”, prepared by Withee Malcolm Architects and the City of Torrance.

These Specifications are intended to govern all aspects of the appurtenant construction including, but not limited to, materials, methods and details, except as modified herein or as inconsistent with the provisions hereof.

DEFINITIONS

Whenever the following terms are used, they shall be understood to mean and refer to the following:

Agency or City - City of Torrance.

Board- The City Council of the City of Torrance herein referred to as City Council.

City Manager - The City Manager of the City of Torrance, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Consulting Architect – Jeff Lemler
Withee Malcolm Architects
2251 West 190th Street
Torrance, CA 90504
direct 424.266.6934
fax 310.217.0425
jlemler@witheemalcolm.com

Laboratory - The designated laboratory authorized by the City of Torrance to test materials and work involved in the contract.

SECTION B. REFERENCE TO STANDARDS OR PUBLICATIONS

Any reference made in the Contract Documents to any specification, standard, or publication of any organization shall, in the absence of a specific designation to the contrary, be understood to refer to the latest edition of the specification, standard, or publication in effect as of the date of advertising the work, except to the extent that said standard or publication may be in conflict with applicable laws, ordinances, or governing codes. Contractors should be aware of all new code requirements (such as Cal-Green) when dealing with HVAC and other general building work. No requirements of these specifications or the drawings shall be waived because of any provisions of, or omission from, said standards or publications.

SECTION C. DESCRIPTION OF THE WORK

1. Scope of the Work. The work to be done consists of furnishing all labor, materials, tools; equipment and incidentals complete the renovation of the accessibility upgrades at El Retiro and Southeast libraries as shown in the plans and specifications prepared by Withee Malcolm Architects for the City of Torrance.

SECTION D. GENERAL PROCEDURES

1. Specifications and Drawings Complementary. The Specifications and Drawings are complementary, and what is called for in one shall be as binding as if called for in both.
2. Order of Precedence of Contract Documents. In resolving conflicts resulting from conflicts, errors, or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:
 - a. Change Orders (Including Plans and Specifications attached thereto).
 - b. Public Works Agreement
 - c. Addenda
 - d. Special Provisions
 - e. Plans
 - f. Standard Plans
 - g. Instructions to Bidders
 - h. Standard Specifications

Within the Specifications the order of precedence is as follows:

- a. Addenda/Change Orders
- b. Permits from other agencies/supplemental agreements
- c. Special Provisions
- d. Instructions to Bidders
- e. Referenced Standard Drawings
- f. Referenced Standard Specifications

With reference to the Drawings the order of precedence is as follows:

- a. Change Orders drawings govern over Addenda and Contract Drawings
- b. Addenda drawings govern over Contract drawings
- c. Contract drawings govern over shop drawings and standard drawings
- d. Detail drawings govern over general drawings
- e. Figures govern over scaled dimensions

3. Discrepancies in the Contract Documents. Any discrepancies, conflicts, errors or omissions found in the Contract Documents shall be promptly reported in writing to the City Manager, who will issue a correction in writing. The Contractor shall not take advantage of any such discrepancies, conflicts, errors or omissions, but shall comply with any corrective measures regarding the same prescribed by the City Manager, and no additional payment or time shall be allowed therefor.

If discrepancies are discovered between the drawings and the specifications, and no specific interpretation is issued prior to bidding, the decision regarding this interpretation shall rest with the City Manager. The Contractor shall be compelled to act on the City Manager's decision as directed. In the event the installation is not in compliance with the direction of the City Manager, the installation shall be corrected by and at the expense of the Contractor at no additional cost to the City.

See Section C of these Special Provisions for "Claims".

4. Errors and Omissions. If the Contractor, in the course of the work, becomes aware of any claimed errors or omissions in the contract documents or in the City's field work, he shall immediately inform the City Manager. The City Manager shall promptly review the matter, and if the City Manager finds an error or omission has been made the City Manager shall determine the corrective actions and advise the Contractor accordingly. If the corrective work associated with an error or omission increases or decreases the amount of work called for in the Contract, the City shall issue an appropriate Change Order. After discovery of an error or omission by the Contractor, any related work performed by the Contractor shall be done at its risk unless authorized by the City Manager.

5. Changed Conditions. The plans for the work show conditions as they are believed by the City Manager to exist, but it is not intended or to be inferred that the conditions as shown thereon constitute a representation by the City that such conditions are actually existent, nor shall the City be liable for any loss sustained by the Contractor as a result of any variance of the conditions as shown on the plans and the actual conditions revealed during the progress of the work or otherwise. The word "conditions" as used in this paragraph includes, but is not limited to, site conditions, both surface and subsurface.

The Contractor shall examine the site, compare it with the drawings and specifications and shall satisfy itself as to the conditions under which the work is to be performed. The Contractor shall ascertain and check the location of all existing structures, utilities and equipment, which may affect its work. The Contractor shall be responsible to re-examine the site, as necessary, for performance of change orders or other proposed changes, which may affect its work. No allowance shall subsequently be made on the Contractor's behalf for any extra expense or loss of time, which is incurred due to failure or negligence on its part to make such examination.

6. As-built Drawings. The Contractor shall maintain a control set of Plans and Specifications on the Work site at all times. All final locations determined in the field, and any deviations from the Plans and Specifications, shall be marked in red on this control set to show as-built conditions. Upon completion of the Work, the Contractor shall submit the control set to the Engineer for approval. Final payment will not be made until this requirement is met.
7. Construction Staking. The Contractor is responsible for all construction staking and shall be responsible for the cost of any restaking required due to disturbance caused by its operations, failure to protect the work site from vandalism or other causes of loss.
8. Notice to Proceed. Notwithstanding any other provisions of the Contract, the Contractor shall not be obligated to perform any work and the City shall not be obligated to accept or pay for any work performed by the Contractor prior to delivery of a Notice to Proceed.

The City's knowledge of work being performed prior to delivery of the Notice to Proceed shall not obligate the City to accept or pay for such work. The Contractor shall provide all required contract bonds and evidences of insurance prior to commencing work at the site.

9. Delay in Obtaining Materials. No extension of time will be granted for a delay caused by the inability to obtain materials unless the Contractor either obtains advance written approval from the City Manager or obtains from the supplier and furnishes to the City Manager documentary proof that such materials could not be obtained due to war, government regulations, labor disputes, strikes, fires, floods, adverse weather necessitating the cessation of work, or other similar action of the elements. The Contractor is required to order materials in a timely manner as specified in the "Instruction to Bidders".
10. Inspection and Testing. The Work is subject to inspection and approval by the CITY. The Contractor shall notify the CITY a minimum of 48 hours in advance of the required inspection.

The CITY will make, or have made, such inspections and tests, as he deems necessary to see that the Work is in conformance with the Contract Documents. In the event such inspections or tests reveal noncompliance with the Contract Documents, the Contractor shall bear the cost of such corrective measures as deemed necessary by the CITY, as well as the cost of subsequent re-inspection and re-testing.

Work done in the absence of inspection by the CITY may be required to be removed and replaced under the inspection of the CITY, and the entire cost of removal and replacement, including the cost of all materials which may be furnished by the CITY and used in the work thus removed, shall be borne by the Contractor, regardless of whether the work removed is found to be defective or not. Work covered without the approval of the CITY shall, if so directed, be uncovered to the extent required by the CITY, and the Contractor shall similarly bear the entire cost of performing all the work and furnishing all the materials necessary for the removal of the covering and its subsequent replacement, including all costs for additional inspection.

The CITY and any authorized representatives shall at all times have access to the Work during its construction at shops and yards as well as the Work site. The Contractor shall provide every reasonable facility for ascertaining that the materials and workmanship are in accordance with the Contract Documents.

Inspection of the Work shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.

11. Project Schedule

- 12.1 The Contractor shall submit a Construction Schedule in accordance with the project manual to the City Manager prior to beginning construction. No work may be started until the Schedule has been approved in writing. The work shall be scheduled to assure that construction will be completed within the specified time. The Contractor shall be responsible for coordination of all phases of the operation so that the time schedule can be met.

12.2 If the Contractor desires to make a major change in its method or operations after commencing construction or if their Schedule fails to reflect the actual progress, the Contractor shall submit to the City Manager a revised Construction Schedule in advance of beginning revised operations.

12. Mobilization

13.1 Scope. Mobilization shall include the provision of the Construction Schedule; site review; obtaining all permits, insurance, and bonds; moving onto the site all plant and equipment; furnishing and erecting plants, temporary buildings, and other construction facilities, and removal of same at completion of the project; all as required for the proper performance and completion of the work.

Mobilization shall include, but not be limited to, the following principle items.

- (a) Submittal and modification, as required, of the Construction Schedule.
- (b) All associated documentation and submittals required by Exhibit A of the contract.
- (c) Installing temporary construction power and wiring.
- (d) Establishing fire protection system.
- (e) Developing construction water supply.
- (f) Providing on-site sanitary facilities and portable water facilities, as required.
- (g) Arranging for and erection of Contractor's work and storage yard.
- (h) Submittal of all required insurance certificates and bonds, including subcontractors.
- (i) Obtaining all required permits.
- (j) Posting all OSHA required notices and establishment of safety programs.
- (k) Have the Contractor's superintendent at the job site full-time.
- (l) Pot-holing and other research and review as necessary to verify site conditions and utility locations, including research and review as necessary for change orders.
- (m) Demobilization.

13. Markup. The following percentages shall apply for additional work:

Profit	5% maximum
Overhead	5% maximum

The markups mentioned hereinafter shall include, but are not limited to, all costs for the services of superintendents, project managers, timekeepers and other personnel not working directly on the change order, and pickup or yard trucks used by the above personnel, and other vehicles and/or equipment present at the jobsite but not directly used in actual construction activities. Incidental movements of labor, materials, supplies or equipment shall not be considered as use in actual construction activities. These costs shall not be reported as labor or equipment elsewhere, except when actually performing work directly on the change order and then shall only be reported at the labor classification of the work performed.

The City shall not pay for the cost of foremen or a superintendent unless authorized in advance by the City Manager. To the sum of the costs and markups provided for in this subsection, one (1) percent shall be added as compensation for bonding.

14. Utilities

The Contractor shall provide coordination with all the utility companies involved and shall provide protection from damage to their facilities. The Contractor shall be responsible for repair or replacement to said facilities made necessary by its failure to provide required protection. The Contractor is required to include utility requirements in the Construction Schedule.

The Contractor shall be solely responsible to check all utility record maps, books, and/or other data in the possession of the CITY, other agencies, and/or all utility companies, and no allowance shall be made for any failure to have done so.

The Contractor shall utilize the services of "Underground Service Alert - Southern California" for utility locating in all public right-of-ways by calling 1-800-227-2600 at least 48 hours prior to any excavation.

15. Completion, Acceptance and Warranty

If, in the CITY's judgment, the Work has been completed and is ready for acceptance, the CITY will so certify and will determine the date when the Work was completed. This will be the date when the Contractor is relieved from responsibility to protect the Work. The CITY may cause a Notice of Completion to be filed and recorded with the Los Angeles County Recorder's Office. At the CITY's option, the CITY may certify acceptance to the City Council who may then cause a Notice of Completion to be filed and recorded with the Los Angeles County Recorder's Office.

Manufacturer's warranties and guaranties furnished for materials used in the Work and instruction sheets and parts listed supplied with materials shall be delivered to the CITY prior to acceptance of the Work. The duration of the warranty or guaranty shall be the standard of the industry with a minimum of 1 year from the date of Notice of Completion.

Manufacturer's warranties shall not relieve the Contractor of liability under these Specifications. Such warranties only shall supplement the Contractor's responsibility.

The CITY may require a manufacturer's warranty on any product offered for use.

16. Contractor's Representative

The Contractor's Representative shall be approved by the CITY prior to the start of the Work. If the designated representative is rejected, the Contractor shall immediately designate another representative in writing and submit to the City for consideration. The CITY shall have the authority to require the Contractor to remove its representative and/or alternate representative at any time and at no cost to the CITY.

17. Waste Reduction and Recycling Requirements for Construction and Demolition Projects

Section 43.8.1 Definitions.

For the purposes of this Article, the following definitions apply:

- a) "Administrative penalty" means any penalty or fine assessed to an applicant.
- b) "Applicant" means any individual, firm, limited liability company, association, partnership, political subdivision, government agency, municipality, industry, public or private corporation, or any other entity whatsoever that applies to the City for the applicable permits or approvals to undertake construction, demolition, or renovation projects within the City.
- c) "Certified facility program" means a program wherein a recycling/reuse facility has been pre-approved by the City to provide a minimum of 50% diversion for all processed loads.
- d) "Construction" means the building or improvement of any facility or structure or any portion thereof including any tenant improvements to an existing facility or structure.
- e) "Construction and Demolition Debris" ("C&D Debris") means used or discarded materials removed from premises during construction or renovation of a structure resulting from construction, remodeling, repair or demolition operations on any pavement, residential or commercial building or other structure.
- f) "Conversion factor" means the value set forth in the standardized volume-to-weight conversion table approved by the City for use in estimating the volume or weight of materials identified in a Waste Management Plan.
- g) "Covered project" means:
 - 1) All demolition projects; and
 - 2) All construction and renovation projects in which the total costs are, or are projected to be, greater than or equal to one hundred thousand dollars (\$100,000).
- h) "Deconstruction" means the process of carefully dismantling a building or structure in order to salvage components for reuse or recycling.
- i) "Demolitions" means the razing, ruining, tearing down or wrecking of any facility, structure, pavement or building, whether in whole or in part, whether interior or exterior.
- j) "Divert" means to use material for any purpose other than disposal in a landfill or transformation facility.
- k) "Diversion requirement" means redirection from the waste stream of at least 50 percent of the total C&D Debris generated by a project via reuse or recycling.
- l) "Non-covered project" means a construction or renovation project in which the total costs are not projected to be greater than or equal to one hundred thousand dollars (\$100,000).
- m) "Project" means any activity that requires an application for a building permit, demolition permit, or any similar permit from the City.

- n) "Recycling" means the process of collecting, sorting, cleansing, treating and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw material for new, reused or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- o) "Renovation" means any change, addition or modification in an existing structure.
- p) "Reuse" means further or repeated use of materials in their original form.
- q) "Salvage" means the controlled removal of C&D Debris from a permitted building or demolition site for the purpose of recycling, reuse or storage for later recycling or reuse.
- r) "Total costs" means the total construction value of the project using standard commercial and residential valuation formulas.
- s) "Waste Management Plan" ("WMP") means a completed WMP form, approved by the City for the purpose of compliance with this Article, submitted by an applicant for any covered project.
- t) "WMP Compliance Official" ("Official") means the designated City employee(s) authorized and responsible for implementing this Article.

Section 43.8.2. Threshold for Covered Projects.

- a) Covered Projects. For the purposes of determining whether a project meets the threshold, all phases of a project and all related projects taking place on single or adjoining parcels, as determined by the Official, will be deemed a single project.
- b) Non-covered Projects. Non-covered projects are not required to meet the waste diversion requirements of this Article. However, an applicant for a non-covered project will be encouraged to divert as much project-related C&D Debris as possible.

Section 43.8.3. Submittal of A Waste Management Plan.

- a) An applicant for a covered project must submit a WMP on a form approved by the City as part of the application requirements for a demolition, construction or remodeling permit. The completed WMP must include the following:
 - 1) Estimated weight of project C&D Debris, by material type, that will be generated; and
 - 2) Maximum weight of each material type that can be feasibly diverted through deconstruction, reuse or recycling; and
 - 3) Facility or vendor that will be used to collect or receive that material; and
 - 4) Estimated weight of C&D Debris that will be landfilled; and
 - 5) Total square footage of the project.

Section 43.8.4. Review Of A Waste Management Plan.

- a) Approval. Notwithstanding any other provision of this Code, no permits will be issued for any covered project, unless and until the Official has approved the WMP. If the Official determines that the required conditions have been met, the WMP will be marked "Approved" and a copy of the WMP returned to the applicant. A WMP will be approved only if the Official determines that the following conditions have been met:
 - 1) The WMP provides all of the information set forth in Section 43.8.3; and
 - 2) The WMP indicates that at least 50 percent of all C&D Debris generated by the project will be diverted through recycling, deconstruction or reuse.
- b) Exception for Public Health or Safety. WMP approval will not be required when the City determines that an emergency demolition is required to protect public health or safety.
- c) Non-approval. If the Official determines that the WMP does not meet the required conditions, the Official will either:
 - 1) Return to the applicant the WMP marked "Denied", including a statement of reasons for non-approval; or
 - 2) Return to the applicant the WMP marked "Further Explanation Required."

Section 43.8.5 Compliance With A Waste Management Plan.

a) Documentation. Prior to the issuance of a certificate of occupancy for any covered project, the applicant must submit documentation that it has met the diversion requirement for the project to the Official. This documentation must include the following:

- 1) A copy of the previously approved WMP for the project with the addition of the actual material volume or weight generated by the project; and
- 2) Receipts from both disposal and diversion facilities and/or vendors that received each material showing whether the material was landfilled or deconstructed, reused and/or recycled; and
- 3) Any additional information that the applicant believes is relevant to determining its efforts to comply with this Article; and
- 4) If the City creates a certified facility program, documentation that a certified facility was used for disposal/recycling for a project will achieve compliance with the requirements of this Article.

b) Weighing of C&D Debris. An applicant must make reasonable efforts to ensure that all C&D Debris diverted or landfilled is measured and recorded using the most accurate method of measurement available. To the extent practical, all C&D Debris must be weighed by measurement on scales. Scales must be in compliance with all regulatory requirements for accuracy and maintenance as set forth by the State of California Bureau of Weights and Measures. For C&D Debris for which weighing is not practical due to its small size or to other considerations as determined by the Official, a volumetric measurement will be used. For conversion of volumetric measurements to weight, the applicant must use the standardized conversion rates approved by the City for this purpose.

c) Determination of compliance. The Official will review the information submitted by the applicant and determine whether the applicant has complied with the diversion requirement as follows:

1) Full compliance: If the Official determines that the applicant has fully complied with the diversion requirement applicable to the project, such compliance will be indicated on the WMP.

2) Noncompliance: Administrative Penalty: If the Official determines that the applicant has not complied with this Article, or the applicant fails to submit the documentation required, then the applicant will be assessed an administrative penalty. The amount of the penalty assessed will be ten thousand dollars (\$10,000) for demolition projects and five thousand dollars (\$5,000) for construction and remodeling projects. A project that includes demolition in addition to construction or remodeling will be subject to the demolition penalty amount.

Section 43.8.6. Infeasibility Exemption.

a) Application. If an application for a covered project experiences unique circumstances that the applicant believes make it infeasible to comply with the diversion requirement, the applicant may apply for an exemption at the time that the WMP is submitted. An applicant applying for an exemption must indicate on the WMP the minimum rate of diversion that is feasible for each material and the specific circumstances that make it infeasible to comply with the diversion requirement.

b) Meeting with the Official. The Official will review the information supplied by the applicant and may meet with the applicant to discuss possible ways of meeting the diversion requirement.

c) Granting of exemption. The Official will issue an infeasibility exemption if the following findings are made:

- 1) Circumstances exist which are unique to the project such that compliance with the provisions of this Article would create an unusual burden on the project which is different than that of similarly situated projects; or
- 2) For a specific project, compliance with the requirements of the ordinance codified in this Article would result in minimal or no increase in recycled materials or reduction in the waste stream; or
- 3) That diversion of one or more substances involved in the project presents unique and burdensome obstacles and would create an especially onerous economic burden on the project unless diversion of that substance is reduced or eliminated; or
- 4) A project is a re-roofing Project.

If the Official is able to make one or more of the above findings for a project, the Official may excuse the project from compliance with this Article, or determine the maximum feasible reduced diversion rate for each material and indicate this rate on the WMP submitted by the applicant.

d) Denial of exemption. If the Official determines that it is possible for the applicant to meet the diversion requirement, the Official will so inform the applicant in writing. The applicant will have thirty (30) days to resubmit a WMP. If the applicant fails to resubmit the WMP, or if the resubmitted WMP does not comply with Section 43.8.3, the Official will deny the WMP in accordance with Section 43.8.4.

Section 43.8.7. Appeal.

a) The determination of the Official may be appealed to the Public Works Director or his/her designee upon written request of any applicant. An applicant must file the appeal within fifteen (15) days after the rendering of the original decision. The date of the rendering of the original decision will be determined in accordance with Section 11.6.1 of this Code. The decision of the Public Works Director or his/her designee will be final.

b) The notice of appeal of the decision of the Official must contain the following information in addition to the information given by the applicant thereon or reasonably required by the City Clerk therefor:

- 1) The name, address, and telephone number of the applicant; and
- 2) The type of action requested; and
- 3) The date on which said decision was made and the name of the Official taking such action; and
- 4) The grounds on which the appeal is taken.

c) The fee for filing an appeal will be charged as provided by resolution of the City Council.

CITY OF TORRANCE
 Construction & Demolition Waste Management Plan (WMP)
THE REQUIRED GOAL IS TO REUSE OR RECYCLE AT LEAST 50% OF PROJECT WASTE

- 1) As part of your application, you must complete the front and back of this page and the "estimate" or left side of the table on the backside of this page to the best of your ability, indicating that you will recycle at least 50% of the waste from the project.
- 2) As your project proceeds, collect and keep receipts of all waste disposed, recycled, reused or donated.
- 3) To final your project, you must then fill out the "actual" or right side of the table on the backside of this sheet, and submit it again with all the receipts to verify that at least 50% of the project's waste was diverted from the landfills.

If you have any questions about the City's C & D Recycling Ordinance or how to fill out this form, please call (310) 781-6900.

Use tons to quantify total estimated waste and percentages of materials. A conversion table is available. Ask your hauler, recycler or site cleanup vendor to assist you with this WMP.

Please note, if you are contracting with a different company to haul your waste or using a roll off box from another company, that company must have a business license to operate in the City of Torrance.

A COPY OF THIS WMP AND RECEIPTS (TICKETS) FOR ALL RECYCLING AND DISPOSAL SHALL BE SUBMITTED BEFORE THE PROJECT WILL RECEIVE FINAL BUILDING APPROVAL. (FOR DEMO PERMITS, THE RECEIPTS FOR THE DEMOLITION WASTE SHOULD BE PROVIDED BEFORE THE FIRST FOOTING INSPECTION AFTER THE BUILDING PERMIT HAS BEEN ISSUED.)

Project Name: _____

Location: _____

Requesting Infeasibility Exemption: Yes No

Contractor Name: _____ Contact Name: _____

Address: _____ Contact Phone: _____

Recycler: _____ Recycler Contact: _____

Recycler Address: _____ Recycler Contact Phone: _____

CITY USE ONLY	
	Application (Date) Final (Date)
Approved	
Further explanation needed (see attached)	
Denied	
Infeasibility Exemption Approved	
Reviewed By	

Submit this form and the attached Waste Management Plan Table to:
 Compliance Official

WMP

City of Torrance
 20500 Madrona Avenue
 Torrance, CA 90503

CITY OF TORRANCE
Construction & Demolition Waste Management Plan Table

Project Name: _____

Total Estimated Waste Generated by Project: _____ (in tons). (Ask your hauler, recycler or site cleanup vendor to assist you. Use receipts from your previous jobs for estimates)					
Complete and return with Building Permit Application			Complete and return with receipts prior to final building approval		
Material Type	Estimated Reused/ Recycled	Estimated Disposed/ Landfilled	Actual Reused/ Recycled	Actual Disposed/ Landfilled	Vendor or Facility Used (Destination)
Asphalt & Concrete					
Bricks/Masonry/Tiles					
Building Materials (doors, windows, fixtures, etc.)					
Cardboard					
Concrete Pavement and Grindings					
Drywall (new, unpainted)					
Asphalt Pavement Grindings					
Landscape Debris (Plant & Tree Trimmings)					
Scrap Metal					
Unpainted Wood & Pallets					
Other (painted wood & drywall, roofing, etc.)					
Mixed C&D*					
Trash/Garbage					
TOTAL					

If you are requesting an infeasibility exemption and the estimated amount reused/recycled is less than 50%, please explain why (attach additional sheets if necessary):

If the actual amount reused/recycled is less than 50%, please explain why:

Prepared by (please print): _____ Date: _____

Signature: _____ Phone Number: _____

* *Mixed C&D* is defined as a mixture of three or more materials (e.g. wood, drywall, roofing, etc.) from construction or demolition sites that will be taken to a facility capable of recycling those commingled materials.

SECTION E. PAYMENTS TO CONTRACTOR AND CLAIMS

1. Breakdown of Contract Prices. The Contractor shall, within ten (10) working days of receipt of a request from the City, submit a complete breakdown of lump sum bid prices showing the value assigned to each part of the work, including an allowance for profit and overhead. In submitting the breakdown, the Contractor certifies that it is not unbalanced and that the value assigned to each part of the work represents its estimate of the actual cost, including profit and overhead, of performing that part of the work. The breakdown shall be sufficiently detailed to permit its use by the City Manager as one of the bases for evaluating requests for payment. No extra costs shall be allowed for these breakdowns.
2. Payment for Labor and Materials. The Contractor shall pay and cause the subcontractors to pay any and all accounts for labor, including Worker's Compensation premiums, State Unemployment and Federal Social Security payments and all other wage and salary deductions required by law. The Contractor also shall pay and cause the subcontractors to pay any and all accounts for services, equipment and materials used by it and the subcontractors during the performance of work under this contract. All such accounts shall be paid as they become due and payable. If requested by the City Manager, the Contractor shall immediately furnish the City with proof of payment of such accounts. Please see Exhibit A of the Public Works Agreement for further contract requirements.
3. Additional Work. Payment for additional work and all expenditures in excess of the bid amount must be authorized in writing by the City Manager. Such authorization shall be obtained by the Contractor prior to engaging in additional work. It shall be the Contractor's sole responsibility to obtain written approval from the City Manager for any change(s) in material or in the work proposed by suppliers or subcontractors. No payment shall be made to the Contractor for additional work which has not been approved in writing, and the Contractor hereby agrees that it shall have no right to additional compensation for any work not so authorized.
4. Claims. The Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act, or failure to act, by the City, or the happening of any event, thing or occurrence, unless he shall have given the City due written notice of potential claim as hereinafter specified.

The written notice of potential claim shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. Said notice shall be submitted on a form approved by the City at least forty-eight (48) hours (two working days) in advance of performing said work, unless the work is of an emergency nature, in which case the Contractor shall notify and obtain approval from the Inspector prior to commencing the work. The City Manager may require the Contractor to delay construction involving the claim, but no other work shall be delayed, and the Contractor shall not be allowed additional costs for any said delay but may be allowed on extension of time if the City Manager agrees that the work delayed is a controlling element of the Construction Schedule. The Contractor shall be required to submit any supporting data (or a detailed written explanation justifying further delay) within five (5) Work Days of a request from the City Manager and shall be responsible for any delays resulting from late and/or incomplete submittals. By submitting a Bid, the Contractor hereby agrees that this Section shall supersede Sections 6-6.3 and 6-6.4 of the Standard Specifications.

The City shall be the sole authority to interpret all plans, specifications and contract documents, and no claim shall be accepted which is based on the Contractor's ignorance, misunderstanding or noncompliance with any provision or portion thereof.

The Contractor shall be responsible to provide all data and to obtain all approvals required by said Specifications. No claims or extras shall be approved by the City unless all work was done under the direction of and subject to the approval of the Inspector.

It is the intention of this Subsection that differences between the parties arising under and by virtue of the Contract be brought to the attention of the City Manager at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that it shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was filed.

5. Noncompliance with Plans and Specifications. Failure of the Contractor to comply with any requirement of the Plans and Specifications, and/or to immediately remedy any such noncompliance upon notice from the City Manager, may result in suspension of Contract Progress Payments. Any Progress Payments so suspended shall remain in suspension until the Contractor's operations and/or submittals are brought into compliance to the satisfaction of the City Manager. No additional compensation shall be allowed as a result of suspension of Progress Payments due to noncompliance with the plans or specifications. The Contractor shall not be permitted to stop work due to said suspension of Progress Payments.

6. Request for Payment. Contractor shall submit all requests for payment on AIA Document G702 – Application and Certificate for Payment and G703- Continuation Sheet. For each item provide a column for listing: Item Number; Description of Work; Scheduled Value, Previous Application; Authorized Change Orders; Total completed and Stored to Date of Application; Percentage of Completion; Balance to Finish; and Retainage.

Prior to submittal of said form, all items for which payment is requested shall be checked and approved in writing by the City Manager. No payments will be made unless all back-up data is submitted with the payment request and the Progress Payment Invoice is signed by both Contractor and Manager.

The City will retain 5 percent of the value of all work done and materials installed as part security for fulfillment of the contract by Contractor. The full 5 percent retention will be retained on all payments for 35 days after the filing of the Notice of Completion.

There shall be no separate payment for any relocations, barriers or forms, grading or temporary construction required to construct the improvements herein. Payment for these items shall be absorbed in the Bid Prices for the applicable work to which they are appurtenant, and no extra costs shall be allowed.

The payment of amounts due to the Contractor shall be contingent upon the Contractor furnishing the City with a release of all claims against the City arising by virtue of the Contract related to said amounts. It is the contractor's responsibility to provide the correct releases in order to obtain payment by the City. The Contractor shall provide the City with Unconditional Lien Release on Final Payment with a zero balance is required from all material suppliers and subcontractors with the request for final payment.

PART D
BID DOCUMENTS

BIDDER'S PROPOSAL

**BID FOR EL RETIRO AND SOUTHEAST LIBRARY
ACCESSIBILITY UPGRADES
B2013-37**

In accordance with the Notice Inviting Bids pertaining to the receiving of sealed proposals by the City Clerk of the City of Torrance for the above titled improvement, the undersigned hereby proposes to furnish all work to be performed in accordance with the Plans, Specifications and Contract Documents, prepared by Withee Malcolm Architects for the lump sum bid as set forth in the following schedules.

Assignment of Contractor's values:

Item	Description	El Retiro Library Accessibility Upgrades Total Amount	Southeast Library Accessibility Upgrades Total Amount
Division 01	General Requirements:		
Division 02	Site Work:		
Division 03	Concrete:		
Division 04	Masonry:		
Division 05	Metals:		
Division 06	Wood and Plastics:		
Division 07	Thermal and Moisture Protection:		
Division 08	Doors and Windows:		
Division 09	Finishes:		
Division 10	Specialties:		
Division 11	Equipment:		
Division 12	Furnishings:		

Item	Description	El Retiro Library Accessibility Upgrades Total Amount	Southeast Library Accessibility Upgrades Total Amount
Division 13	Special Construction:		
Division 14	Conveying Systems:		
Division 15	Mechanical:		
Division 16	Electrical:		
	BID TOTAL- in figures*		

EL RETIRO LIBRARY TOTAL: _____
(Words)*

SOUTHEAST LIBRARY TOTAL: _____
(Words)*

***BID MAY BE REJECTED IF TOTAL IS NOT SHOWN IN FIGURES AND WORDS.**

The undersigned furthermore agrees to enter into and execute a contract, with necessary bonds, at the prices set forth herein and in case of default in executing such contract, with necessary bonds, the check or bond accompanying this bid and the money payable thereon shall be forfeited thereby to and remain the property of the City of Torrance.

The above prices include all work appurtenant to the various items as outlined in the specifications and all work or expense required for the satisfactory completion of said item.

The undersigned declares that it has carefully examined the Plans, Specifications, and Contract Documents, and has investigated the site of the work and is familiar with the conditions thereon.

Contractor Name

Signer's Name and Title

Date: _____ License No. & Classification _____

Address:

ACKNOWLEDGMENT OF ADDENDA RECEIVED

B2013-37

The Bidder shall acknowledge the receipt of addenda by placing an "X" by each addendum received.

Addendum No. 1 _____

Addendum No. 2 _____

Addendum No. 3 _____

Addendum No. 4 _____

Addendum No. 5 _____

Addendum No. 6 _____

Addendum No. 7 _____

Addendum No. 8 _____

If an addendum or addenda have been issued by the City and not noted above as being received by the Bidder, the Bid Proposal may be rejected.

Bidder's Signature

Date

CONTRACTOR'S AFFIDAVIT (CONTINUED)

7. That the Contractor did not, directly or indirectly, submit the Contractor's bid price or any breakdown thereof, or the contents thereof, or divulge information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, or to any individual or group of Individuals, except to the City of Torrance, or to any person or persons who have a partnership or other financial interest with said Contractor in its business.

Dated this _____ day of _____, 20_____.

Subscribed and Sworn to
before me this _____
of _____, 20_____

(Contractor)

(Title)

Notary Public in and for said
County and State.
(Seal)

BID BOND

B2013-37

KNOW ALL MEN BY THESE PRESENTS: That we, _____

as principal, and _____
as sureties, are held and firmly bound unto the City of Torrance, State of California, in the penal sum of _____ dollars (\$ _____), for the payment whereof we hereby bind ourselves, our successors, heirs, executors or administrators jointly and severally, firmly by these presents.

The condition of this obligation is such that, whereas the above bounded principal is about to file with and submit to the City of Torrance a bid or proposal for the performance of certain work as required in the City of Torrance, Project No. B2013-37, said work being: the El Retiro and Southeast Library Accessibility Upgrades, in compliance with the Specifications therefore under an invitation of said City contained in a notice or advertisement for bids or proposals; now if the bid or proposal of said principal shall be accepted and if said work be thereupon awarded to the principal by said City and if the said principal shall enter into a contract with the said City in accordance with said bid or proposal, or if the bid or proposal of the said principal is rejected, then this bond shall be void and of no effect and otherwise in full force and effect.

WITNESS our hands this _____ day of _____, 20 _____.

Principal

Surety/Attorney-in-Fact

Signature

Name: _____
Local Address: _____

Phone No.: _____
Fax No.: _____

LIST OF SUBCONTRACTORS

The Bidder is required to fill in the following blanks in accordance with the provisions of the Subletting and Subcontracting Fair Practices Act (Chapter 2 of Division 5, Title 1 of the Government Code of the State of California) and should familiarize itself with Section 2-3 of the Standard Specifications.

Name under Which Subcontractor is Licensed: _____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

Name under Which Subcontractor is Licensed: _____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

Name under Which Subcontractor is Licensed: _____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

Name Under Which Subcontractor is Licensed: _____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

Subcontractors listed in accordance with the provisions of Section 2-3 must be properly licensed under the laws of the State of California for the type of work which they are to perform. Do not list alternate subcontractors for the same work.

REFERENCES

(Public Works projects similar in magnitude and degree of difficulty completed by Contractor within the past five (5) years).

1.Name (Firm/Agency): _____

Address: _____

Contact Person: _____ Telephone No.: _____

Title of Project: _____

Project Location: _____

Date of Completion _____ Contract Amount:\$ _____

2.Name (Firm/Agency): _____

Address: _____

Contact Person: _____ Telephone No.: _____

Title of Project: _____

Project Location: _____

Date of Completion _____ Contract Amount:\$ _____

3.Name (Firm/Agency): _____

Address: _____

Contact Person: _____ Telephone No.: _____

Title of Project: _____

Project Location: _____

Date of Completion _____ Contract Amount:\$ _____

4.Name (Firm/Agency): _____

Address: _____

Contact Person: _____ Telephone No.: _____

Title of Project: _____

Project Location: _____

Date of Completion _____ Contract Amount: \$ _____

Bidder's Information

The bidder must provide a detailed list of the trades and the description of the work they will perform with their own company for this project.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

Contractor's License No.: _____ Class: _____

Date first obtained: _____

Has License ever been suspended or revoked? _____

If yes, describe when and why _____

Any current claims against License or Bond? _____

If yes, describe claims: _____

Type of entity (check one)

_____ Incorporated _____ Partnership _____ Sole Proprietorship

If incorporated, in what state _____

Federal Tax ID Number # _____

Principals in Company (List all - attach additional sheets if necessary):

<u>NAME</u>	<u>TITLE</u>	<u>LICENSE NO.</u> (If Applicable)
_____	_____	_____
_____	_____	_____
_____	_____	_____

PART E.

**DOCUMENTS TO BE COMPLETED
AND DELIVERED TO CITY AS PART
OF CONTRACT WITH THE CITY**

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as Principal(s) and ____ a _____ corporation, incorporated, organized, and existing under the laws of the State of _____, and authorized to execute bonds and undertakings and to do a general surety business in the State of California, as Surety, are jointly and severally held and firmly bound unto the City of Torrance, a municipal corporation, located in the County of Los Angeles, State of California, in the full and just sum of: _____ Dollars (\$ _____), lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves and our respective heirs, executors, administrators, representative, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that: WHEREAS, said Principal(s) have/has entered into, or are/is about to enter into, a certain written contract or agreement, dated as of the _____ day of _____, 20____, with the said City of Torrance for the EL RETIRO AND SOUTHEAST LIBRARY ACCESSIBILITY UPGRADES, B2013-37, all as is more specifically set forth in said contract or agreement, a full, true and correct copy of which is hereunto attached, and hereby referred to and by this reference incorporated herein and made a part hereof;

NOW, THEREFORE, if the said Principal(s) shall faithfully and well and truly do, perform and complete, or cause to be done, performed and complete, each and all of the covenants, terms, conditions, requirements, obligations, acts and things, to be met, done or performed by said Principal(s), including any guarantee period as set forth in, or required by, said contract or agreement, all at and within the time or times, and in the manner as therein specified and contemplated, then this bond and obligation shall be null and void; otherwise it shall be and remain in full force, virtue and effect.

The said Surety, for value received, hereby stipulates and agrees that no amendment, change, extension of time, alteration or addition to said contract or agreement, or of any feature or item or items of performance required therein or there under, shall in any manner affect its obligations on or under this bond; and said Surety does hereby waive notice of any such amendment, change, extension of time, alteration, or addition to said contract or agreement, and of any feature or item or items of performance required therein or there under.

PERFORMANCE BOND (CONTINUED)

In the event any suit, action or proceedings is instituted to recover on this bond or obligation, said Surety will pay, and does hereby agree to pay, as attorney's fees for said City, such sum as the Court in any such suit, action or proceeding may adjudge reasonable.

EXECUTED, SEALED AND DATED this _____ day of _____, 20____

CORPORATE SEAL

PRINCIPAL(S):

BY _____

BY _____

CORPORATE SEAL

SURETY:

BY _____

Name: _____
Local Address: _____
Phone No.: _____
Fax No.: _____

LABOR AND MATERIAL BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____
As Principal(s) and _____ a
corporation, incorporated, organized, and existing under the laws of the State of
_____, and authorized to execute bonds and undertakings and to do a general
surety business in the State of California, as Surety, are jointly and severally held and firmly
bound unto:

- (a) The State of California for the use and benefit of the State Treasurer, as ex-officio Treasurer and custodian of the Unemployment Fund of said State; and
- (b) The City of Torrance, California; and
- (c) Any and all persons who do or perform or who did or performed work or labor upon or in connection with the work or improvement referred to in the contract or agreement hereinafter mentioned; and
- (d) Any and all materialmen, persons, companies, firms, association, or corporations, supplying or furnishing any materials, provisions, provender, transportation, appliances or power, or other supplies used in, upon, for or about or in connection with the performance of the work or improvement contracted to be executed, done, made or performed under said contract or agreement; and
- (e) Any and all persons, companies, firms, associations, or corporations furnishing, renting, or hiring teams, equipment, implements or machinery for, in connection with, or contributing to, said work to be done or improvement to be made under said contract or agreement; and
- (f) Any and all persons, companies, firms, associations, or corporations who supply both work and materials;

and whose claim has not been paid by said Principal(s), in full and just sum of _____ Dollars (\$_____), lawful money of the United States of America, for the payment of which will and truly to be made, said Principal(s) and said Surety do hereby bind themselves and their respective heirs, executors, administrators, representatives, successors and assigns, jointly and severally, firmly by these presents.

LABOR AND MATERIAL BOND (CONTINUED)

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH, THAT: WHEREAS, said Principal(s) have/has entered into or are/is about to enter into a certain written contract or agreement, dated as of the _____ day of _____ 20 ____, with the City of Torrance for the EL RETIRO AND SOUTHEAST LIBRARY ACCESSIBILITY UPGRADES, B2013-37, all as is more specifically set forth in said contract or agreement, a full, true and correct copy of which is hereunto attached, and hereby referred to and by this reference incorporated herein and made a part hereof;

NOW, THEREFORE, if the said Principal(s) (or any of his/her, its, or their subcontractors) under said contract or agreement fails or fail to pay:

- (1) For any materials, provisions, provender, transportation, appliances, or power, or other supplies; or
- (2) For the hire of any teams, equipment, implements, or machinery; or
- (3) For any work or labor; supplies, furnished, provided, used, done or performed in, upon, for or about or in connection with the said work or improvement; or
- (4) For amounts due under the Unemployment Insurance Act of the State of California with respect to such work or improvement;

the Surety on this bond will pay the same in an amount not exceeding the sum hereinabove specified in this bond; and, also, in case suit is brought upon this bond, said Surety will (and does hereby agree to) pay a reasonable attorney's fee, to be fixed and taxed as costs, and included in the judgment therein rendered.

This bond shall (and it is hereby made to) insure to the benefit of any and all persons entitled to file claims under Section 1192.1 of the Code of Civil Procedure of the State of California, so as to give a right of action to them or their assigns in any suit brought upon this bond, all as contemplated under the provisions of Section 4205 of the Government Code, and of Chapter 1 of Title 4 of Part 3 of the Code of Civil Procedure, of the State of California.

This bond is executed and filed in connection with said contract or agreement hereunto attached to comply with each and all of the provisions of the laws of the State of California above mentioned or referred to, and of all amendments thereto, and the obligors so intend and do hereby bind themselves accordingly.

LABOR AND MATERIAL BOND (CONTINUED)

The said Surety, for value received, hereby stipulates and agrees that no amendment, change, extension of time, alteration, or addition to said contract or agreement, or of any feature or item or items of performance required therein or thereunder, shall in any manner affect its obligations on or under this bond; and said Surety does hereby waive notice of any such amendment, change, extension of time, alteration, or addition to said contract or agreement, and of any feature or item or items of performance required therein or thereunder.

EXECUTED, SEALED AND DATED this _____ day of _____, 20 _____

CORPORATE SEAL

PRINCIPAL:

BY _____

CORPORATE SEAL

SURETY:

BY _____

Name: _____
Local Address: _____
Phone No.: _____
Fax No.: _____

PUBLIC WORKS AGREEMENT

This PUBLIC WORKS AGREEMENT ("Agreement") is made and entered into as of Effective Date, by and between the CITY OF TORRANCE, a municipal corporation ("CITY"), and Company Name, type of Entity.

RECITALS:

- A. The CITY wishes to retain the services of an experienced and qualified CONTRACTOR to furnish all labor, materials, tools, equipment and incidentals in accordance with the plans and specifications prepared for the City of Torrance by Withee Malcolm Architects;
- B. In order to obtain the desired services, The CITY has circulated a Notice Inviting Bids for EL Retiro and Southeast Library Accessibility Upgrades, Notice Inviting Bids No. **B2013-37** (the "NIB"); and
- C. CONTRACTOR has submitted a Bid (the "Bid") in response to the NIB. CONTRACTOR represents that it is qualified to perform those services requested in the Plans and Specifications. Based upon its review of all Bids submitted in response to the NIB, The CITY is willing to award the contract to CONTRACTOR.

AGREEMENT:

1. SERVICES TO BE PERFORMED BY CONTRACTOR

CONTRACTOR will provide the services and install those materials listed in the Plans and Specifications, which are on file in the General Services Department. The NIB and the Plans and Specifications are made a part of this Agreement. A copy of the Bid is attached as Exhibit A.

2. TERM

Unless earlier terminated in accordance with Paragraph 4 below, this Agreement will continue in full force and effect for one year from Effective Date.

3. COMPENSATION

- A. CONTRACTOR's Fee.

For services rendered pursuant to this Agreement, CONTRACTOR will be paid in accordance with CONTRACTOR's Bid; provided, however, that in no event will the total amount of money paid the CONTRACTOR, for services initially contemplated by this Agreement, exceed the sum of \$ unless otherwise first approved in writing by the CITY.

B. Schedule of Payment.

Provided that the CONTRACTOR is not in default under the terms of this Agreement, upon presentation of an invoice, CONTRACTOR will be paid monthly, within 30 days after the date of the monthly invoice.

4. **TERMINATION OF AGREEMENT**

A. Termination by CITY for Convenience.

1. CITY may, at any time, terminate the Agreement for CITY's convenience and without cause.
2. Upon receipt of written notice from CITY of such termination for CITY's convenience, CONTRACTOR will:
 - a. cease operations as directed by CITY in the notice;
 - b. take actions necessary, or that CITY may direct, for the protection and preservation of the work; and
 - c. except for work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.
3. In case of such termination for CITY's convenience, CONTRACTOR will be entitled to receive payment for work executed; and costs incurred by reason of such termination, along with reasonable overhead and profit on the work not executed.

B. Termination for Cause.

1. If either party fails to perform any term, covenant or condition in this Agreement and that failure continues for 15 calendar days after the nondefaulting party gives the defaulting party written notice of the failure to perform, this Agreement may be terminated for cause; provided, however, that if during the notice period the defaulting party has promptly commenced and continues diligent efforts to remedy the default, the defaulting party will have such additional time as is reasonably necessary to remedy the default.
2. In the event this Agreement is terminated for cause by the default of the CONTRACTOR, the CITY may, at the expense of the CONTRACTOR and its surety, complete this Agreement or cause it to be completed. Any check or bond delivered to the CITY in connection with this Agreement, and the money payable thereon, will be forfeited to and remain the property of the CITY. All moneys due the CONTRACTOR under the terms of this Agreement will be retained by the CITY, but the retention will not release the CONTRACTOR and its surety from liability for the default. Under these circumstances, however, the CONTRACTOR and its surety will be credited with the amount of money retained, toward any amount by which the cost of completion exceeds the Agreement Sum and any amount authorized for extra services.

3. Termination for cause will not affect or terminate any of the rights of the CITY as against the CONTRACTOR or its surety then existing, or which may thereafter accrue because of the default; this provision is in addition to all other rights and remedies available to the CITY under law.

C. Termination for Breach of Law.

In the event the CONTRACTOR or any of its officers, directors, shareholders, employees, agents, subsidiaries or affiliates is convicted (i) of a criminal offense as an incident to obtaining or attempting to obtain a public or private contract or subcontract, or in the performance of a contract or subcontract; (ii) under state or federal statutes of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense indicating a lack of business integrity or business honesty which currently, seriously, and directly affects responsibility as a public consultant or contractor; (iii) under state or federal antitrust statutes arising out of the submission of bids or proposals; or (iv) of violation of Paragraph 19 of this Agreement; or for any other cause the CITY determines to be so serious and compelling as to affect CONTRACTOR's responsibility as a public consultant or contractor, including but not limited to, debarment by another governmental agency, then the CITY reserves the unilateral right to terminate this Agreement or to impose such other sanctions (which may include financial sanctions, temporary suspensions or any other condition deemed appropriate short of termination) as it deems proper. The CITY will not take action until CONTRACTOR has been given notice and an opportunity to present evidence in mitigation.

5. **FORCE MAJEURE**

If any party fails to perform its obligations because of strikes, lockouts, labor disputes, embargoes, acts of God, inability to obtain labor or materials or reasonable substitutes for labor or materials, governmental restrictions, governmental regulations, governmental controls, judicial orders, enemy or hostile governmental action, civil commotion, fire or other casualty, or other causes beyond the reasonable control of the party obligated to perform, then that party's performance shall be excused for a period equal to the period of such cause for failure to perform.

6. **RETENTION OF FUNDS**

CONTRACTOR authorizes the CITY to deduct from any amount payable to CONTRACTOR (whether or not arising out of this Agreement) any amounts the payment of which may be in dispute or that are necessary to compensate the CITY for any losses, costs, liabilities, or damages suffered by the CITY, and all amounts for which the CITY may be liable to third parties, by reason of CONTRACTOR's negligent acts or omissions or willful misconduct in performing or failing to perform CONTRACTOR's obligations under this Agreement. In the event that any claim is made by a third party, the amount or validity of which is disputed by CONTRACTOR, or any indebtedness exists that appears to be the basis for a claim of lien, the CITY may withhold from any payment due, without liability for interest because of the withholding, an amount sufficient to cover the claim. The failure of the CITY to exercise the right to deduct or to withhold will not, however, affect the obligations of CONTRACTOR to insure, indemnify, and protect the CITY as elsewhere provided in this Agreement.

7. THE CITY'S REPRESENTATIVE

Tom Kelly, Facility Services Coordinator is designated as the "City Representative," authorized to act in its behalf with respect to the work and services specified in this Agreement and to make all decisions in connection with this Agreement. Whenever approval, directions, or other actions are required by the CITY under this Agreement, those actions will be taken by the City Representative, unless otherwise stated. The City Manager has the right to designate another City Representative at any time, by providing notice to CONTRACTOR.

8. CONTRACTOR REPRESENTATIVE(S)

The following principal(s) of CONTRACTOR are designated as being the principal(s) and representative(s) of CONTRACTOR authorized to act in its behalf with respect to the work specified in this Agreement and make all decisions in connection with this Agreement:

Company Representative

9. INDEPENDENT CONTRACTOR

The CONTRACTOR is, and at all times will remain as to the CITY, a wholly independent contractor. Neither the CITY nor any of its agents will have control over the conduct of the CONTRACTOR or any of the CONTRACTOR's employees, except as otherwise set forth in this Agreement. The CONTRACTOR may not, at any time or in any manner, represent that it or any of its agents or employees are in any manner agents or employees of the CITY.

10. BUSINESS LICENSE

The CONTRACTOR must obtain a City business license prior to the start of work under this Agreement, unless CONTRACTOR is qualified for an exemption.

11. OTHER LICENSES AND PERMITS

CONTRACTOR warrants that it has all professional, contracting and other permits and licenses required to undertake the work contemplated by this Agreement.

12. FAMILIARITY WITH WORK

By executing this Agreement, CONTRACTOR warrants that CONTRACTOR (a) has thoroughly investigated and considered the scope of services to be performed, (b) has carefully considered how the services should be performed, and (c) fully understands the facilities, difficulties and restrictions attending performance of the services under this Agreement. If the services involve work upon any site, CONTRACTOR warrants that CONTRACTOR has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services set forth in this Agreement. Should CONTRACTOR discover any latent or unknown conditions that will materially affect the performance of the services set forth in this Agreement, CONTRACTOR must immediately inform the CITY of that fact and may not proceed except at CONTRACTOR's risk until written instructions are received from the CITY.

13. CARE OF WORK

CONTRACTOR must adopt reasonable methods during the life of the Agreement to furnish continuous protection to the work, and the equipment, materials, papers, documents, plans, studies and other components to prevent losses or damages, and will be responsible for all damages, to persons or property, until acceptance of the work by the CITY, except those losses or damages as may be caused by the CITY's own negligence.

14. CONTRACTOR'S ACCOUNTING RECORDS; OTHER PROJECT RECORDS

Records of the CONTRACTOR's time pertaining to the project, and records of accounts between the CITY and the CONTRACTOR, will be kept on a generally recognized accounting basis. CONTRACTOR will also maintain all other records, including without limitation specifications, drawings, progress reports and the like, relating to the project. All records will be available to the CITY during normal working hours. CONTRACTOR will maintain these records for three years after final payment.

15. INDEMNIFICATION

CONTRACTOR will indemnify, defend, and hold harmless CITY, the City Council, each member thereof, present and future, its officers, agents and employees from and against any and all liability, expenses, including defense costs and legal fees, and claims for damages whatsoever, including, but not limited to, those arising from breach of contract, bodily injury, death, personal injury, property damage, loss of use, or property loss however the same may be caused and regardless of the responsibility for negligence. The obligation to indemnify, defend and hold harmless includes, but is not limited to, any liability or expense, including defense costs and legal fees, arising from the negligent acts or omissions, or willful misconduct of CONTRACTOR, its officers, employees, agents, subcontractors or vendors. It is further agreed, CONTRACTOR's obligations to indemnify, defend and hold harmless will apply even in the event of concurrent negligence on the part of CITY, the City Council, each member thereof, present and future, or its officers, agents and employees, except for liability resulting solely from the negligence or willful misconduct of CITY, its officers, employees or agents. Payment by CITY is not a condition precedent to enforcement of this indemnity. In the event of any dispute between CONTRACTOR and CITY, as to whether liability arises from the sole negligence of the CITY or its officers, employees, agents, subcontractors or vendors, CONTRACTOR will be obligated to pay for CITY's defense until such time as a final judgment has been entered adjudicating the CITY as solely negligent. CONTRACTOR will not be entitled in the event of such a determination to any reimbursement of defense costs including but not limited to attorney's fees, expert fees and costs of litigation.

16. NON-LIABILITY OF THE CITY'S OFFICERS AND EMPLOYEES

No officer or employee of the CITY will be personally liable to CONTRACTOR, in the event of any default or breach by the CITY or for any amount that may become due to CONTRACTOR.

17. INSURANCE

- A. CONTRACTOR must maintain at its sole expense the following insurance, which will be full coverage not subject to self insurance provisions:
 - (1) Automobile Liability, including owned, non-owned and hired vehicles, with at least the following limits of liability:
 - (a) Primary Bodily Injury with limits of at least \$500,000 per person, \$1,000,000 per occurrence; and
 - (b) Primary Property Damage of at least \$250,000 per occurrence; or
 - (c) Combined single limits of \$1,000,000 per occurrence.
 - (2) General Liability including coverage for premises, products and completed operations, independent contractors, personal injury and contractual obligations with combined single limits of coverage of at least \$2,000,000 per occurrence.
 - (3) Workers' Compensation with limits as required by the State of California and Employers Liability with limits of at least \$1,000,000.
- B. The insurance provided by CONTRACTOR will be primary and non-contributory.
- C. The CITY of Torrance, the Successor Agency to the former Redevelopment Agency of the City of Torrance, the City Council and each member thereof, members of boards and commissions, every officer, agent, official, employee and volunteer must be named as additional insureds under the automobile and general liability policies.
- D. CONTRACTOR must provide certificates of insurance and/or endorsements to the City Clerk of the City of Torrance before the commencement of work.
- E. Each insurance policy required by this Paragraph must contain a provision that no termination, cancellation or change of coverage can be made without thirty days notice to the CITY.
- F. CONTRACTOR must include all subcontractors as insureds under its policies or must furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors will be subject to all of the requirements of this Paragraph 17.

18. SUFFICIENCY OF INSURERS

Insurance required by this Agreement will be satisfactory only if issued by companies admitted to do business in California, rated "B+" or better in the most recent edition of Best's Key Rating Guide, and only if they are of a financial category Class VII or better, unless these requirements are waived by the Risk Manager of the CITY ("Risk Manager") due to unique circumstances. In the event the Risk Manager determines that the work or services to be performed under this Agreement creates an increased or

decreased risk of loss to the CITY, the CONTRACTOR agrees that the minimum limits of any insurance policies and/or the performance bond required by this Agreement may be changed accordingly upon receipt of written notice from the Risk Manager; provided that CONTRACTOR will have the right to appeal a determination of increased coverage by the Risk Manager to the City Council of the CITY within 10 days of receipt of notice from the Risk Manager.

19. CONFLICT OF INTEREST

- A. No officer or employee of the CITY may have any financial interest, direct or indirect, in this Agreement, nor may any officer or employee participate in any decision relating to the Agreement that effects the officer or employee's financial interest or the financial interest of any corporation, partnership or association in which the officer or employee is, directly or indirectly interested, in violation of any law, rule or regulation.
- B. No person may offer, give, or agree to give any officer or employee or former officer or employee, nor may any officer or employee solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any way pertaining to any program requirement, contract or subcontract, or to any solicitation or proposal.

20. NOTICE

- A. All notices, requests, demands, or other communications under this Agreement will be in writing. Notice will be sufficiently given for all purposes as follows:
 - (1) Personal delivery. When personally delivered to the recipient: notice is effective on delivery.
 - (2) First Class mail. When mailed first class to the last address of the recipient known to the party giving notice: notice is effective three mail delivery days after deposit in an United States Postal Service office or mailbox.
 - (3) Certified mail. When mailed certified mail, return receipt requested: notice is effective on receipt, if delivery is confirmed by a return receipt.
 - (4) Overnight delivery. When delivered by an overnight delivery service, charges prepaid or charged to the sender's account: notice is effective on delivery, if delivery is confirmed by the delivery service.
 - (5) Facsimile transmission. When sent by fax to the last fax number of the recipient known to the party giving notice: notice is effective on receipt. Any notice given by fax will be deemed received on the next business day if it is received after 5:00 p.m. (recipient's time) or on a non-business day.

Addresses for purpose of giving notice are as follows:

CONTRACTOR:	Company Name Address Address Fax
CITY:	City Clerk City of Torrance 3031 Torrance Boulevard Torrance, CA 90509-2970 Fax: (310) 618-2931

- B. Any correctly addressed notice that is refused, unclaimed, or undeliverable because of an act or omission of the party to be notified, will be deemed effective as of the first date the notice was refused, unclaimed or deemed undeliverable by the postal authorities, messenger or overnight delivery service.
- C. Either party may change its address or fax number by giving the other party notice of the change in any manner permitted by this Agreement.

21. PROHIBITION AGAINST ASSIGNMENT AND SUBCONTRACTING

This Agreement and all exhibits are binding on the heirs, successors, and assigns of the parties. The Agreement may not be assigned or subcontracted by either the CITY or CONTRACTOR without the prior written consent of the other.

22. INTEGRATION; AMENDMENT

This Agreement represents the entire understanding of the CITY and CONTRACTOR as to those matters contained in it. No prior oral or written understanding will be of any force or effect with respect to the terms of this Agreement. The Agreement may not be modified or altered except in writing signed by both parties.

23. INTERPRETATION

The terms of this Agreement should be construed in accordance with the meaning of the language used and should not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction that might otherwise apply.

24. SEVERABILITY

If any part of this Agreement is found to be in conflict with applicable laws, that part will be inoperative, null and void insofar as it is in conflict with any applicable laws, but the remainder of the Agreement will remain in full force and effect.

25. TIME OF ESSENCE

Time is of the essence in the performance of this Agreement.

26. GOVERNING LAW; JURISDICTION

This Agreement will be administered and interpreted under the laws of the State of California. Jurisdiction of any litigation arising from the Agreement will be in Los Angeles County, California.

27. COMPLIANCE WITH STATUTES AND REGULATIONS

CONTRACTOR will be knowledgeable of and will comply with all applicable federal, state, county and city statutes, rules, regulations, ordinances and orders.

28. WAIVER OF BREACH

No delay or omission in the exercise of any right or remedy by a nondefaulting party on any default will impair the right or remedy or be construed as a waiver. A party's consent or approval of any act by the other party requiring the party's consent or approval will not be deemed to waive or render unnecessary the other party's consent to or approval of any subsequent act. Any waiver by either party of any default must be in writing and will not be a waiver of any other default concerning the same or any other provision of this Agreement.

29. ATTORNEY'S FEES

Except as provided for in Paragraph 15, in any dispute, litigation, arbitration, or other proceeding by which one party either seeks to enforce its rights under this Agreement (whether in contract, tort or both) or seeks a declaration of any rights or obligations under this Agreement, the prevailing party will be awarded reasonable attorney's fees, together with any costs and expenses, to resolve the dispute and to enforce any judgment.

30. EXHIBITS

All exhibits identified in this Agreement are incorporated into the Agreement by this reference.

31. CONTRACTOR'S AUTHORITY TO EXECUTE

The persons executing this Agreement on behalf of the CONTRACTOR warrant that (i) the CONTRACTOR is duly organized and existing; (ii) they are duly authorized to execute this Agreement on behalf of the CONTRACTOR; (iii) by so executing this Agreement, the CONTRACTOR is formally bound to the provisions of this Agreement; and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which the CONTRACTOR is bound.

CITY OF TORRANCE,
a Municipal Corporation

Company Name
Type of Entity

Frank Scotto, Mayor

By: _____
Name
Title

ATTEST:

Sue Herbers, City Clerk

APPROVED AS TO FORM:

JOHN L. FELLOWS III
City Attorney

By: _____

Attachments: Exhibit A: Bid

EXHIBIT A

Bid

[To be attached]

PART F

PROJECT SPECIFICATIONS

PROJECT MANUAL

ACCESSIBILITY UPGRADE

OF

CITY OF TORRANCE

**EL RETIRO LIBRARY
126 VISTA DEL PARQUE
AND
SOUTHEAST LIBRARY
23115 S. ARLINGTON AVE
TORRANCE, CALIFORNIA**

PREPARED BY

WITHEE MALCOLM ARCHITECTS, LLP

**2251 WEST 190TH STREET
TORRANCE, CALIFORNIA 90504**

**PH (424)266-6934
FAX (310) 217-0425**

PROJECT NO. A 9041

DATE: APRIL - 2010

TECHNICAL SPECIFICATIONS

DIVISION 1 GENERAL REQUIREMENTS

- 01010 Summary of Work
- 01015 Definitions
- 01048 Contractor's Requests For Information
- 01049 Support From Building Structures
- 01060 Regulatory Requirements
- 01070 Abbreviations
- 01300 Submittals
- 01400 Quality Control
- 01500 Construction Facilities and Temporary Controls
- 01600 Material and Equipment
- 01700 Contract Closeout
- 01740 Warranties and Guarantees
- 01900 Miscellaneous Work

DIVISION 2 SITE WORK

- 02513 Asphaltic Concrete Paving
- 02579 Pavement Markings, Truncated Domes and Signage

DIVISION 3 CONCRETE

- 03100 Forms
- 03200 Concrete Reinforcement
- 03300 Cast-In-Place Concrete
- 03345 Concrete Finishing
- 03720 Anchorage to Existing Concrete

DIVISION 4 MASONRY

- 04220 Concrete Unit Masonry

DIVISION 6 WOOD AND PLASTIC

- 06100 Rough Carpentry

DIVISION 7 THERMAL AND MOISTURE PROTECTION

- 07270 Firestopping
- 07900 Calking and Sealants

DIVISION 8 DOORS AND WINDOWS

- 08110 Hollow Metal
- 08210 Wood Doors
- 08710 Finish Hardware
- 08800 Glass and Glazing
- 08900 Window Wall, Storefront and Entrances

DIVISION 9 FINISHES

- 09100 Metal Support Systems
- 09250 Gypsum Wallboard
- 09300 Tile Masonry
- 09650 Resilient Flooring
- 09682 Carpet Tile
- 09900 Painting
- 09955 Fiberglass Reinforced Polyester Panels

DIVISION 10 SPECIALTIES

- 10010 Building Specialties
- 10800 Toilet Accessories

DIVISION 15 MECHANICAL

- 15000 Mechanical

DIVISION 16 ELECTRICAL

- 16000 Electrical

END OF TABLE OF CONTENTS

SECTION 01010

SUMMARY OF WORK

- 1.01 DESCRIPTION: The Work includes Accessibility Upgrades of CITY OF TORRANCE BRANCH LIBRARY

EL RETIRO LIBRARY
126 Vista Del Parque
Redondo Beach, CA 90277

And

SOUTHEAST LIBRARY
23115 S. Arlington Ave
Torrance, CA 90501

In strict conformance with the Drawings and Specifications prepared by:

WITHEE MALCOLM ARCHITECTS, LLP
2251 West 190th Street
Torrance, California 90504
Telephone (310) 217-8885
Fax: (310) 217-0425

AND OTHER CONSULTANTS

- 1.02 WORK NOT IN THE CONTRACT: The term "NIC" means "Not In Contract". Following portions of the Work will be provided by the Owner under separate contract or other arrangement:

1. All other items indicated or specified as NIC.

- 1.03 INFORMATION TO CONTRACTORS: The Contractor shall be aware the there are various locations discussed in this Manual and not all specification sections are related to all locations. Contractor shall use only sections that apply to his exact project.

END OF SECTION

SECTION 01015

DEFINITIONS

PART 1 - GENERAL

- 1.01 DESCRIPTION: This Section covers additional definitions supplementary to those given in the Conditions of the Contract.
- 1.02 DEFINITIONS:
- A. **Drawings:** Words such as "shown", "indicated", "detailed", "noted", "scheduled", or words of similar import shall mean that reference is made to the information on the Drawings unless stated otherwise.
 - B. **Architect:** Words such as Architect shall mean that of Architect/Engineer unless stated otherwise.
 - C. **Contractor:** Words such as Contractor shall mean specific Prime Contractor(s) unless stated otherwise.
 - D. **Owner/Owner's Representative:** Words such as Owner/Owner's Representative shall mean that of City's Program Manager unless stated otherwise.
 - E. **Construction Manager:** Shall mean the City's Construction Manager.
 - F. **Actions of Architect:** Such words as "directed", "designated", "selected", and words of similar import shall mean that the direction, designation, selection, or similar action of the Architect is intended unless stated otherwise.
 - G. **Required:** The word "required" and words of similar import shall mean "required to complete the Work" and "required by the Architect", as is applicable to the context of the place where used, unless stated otherwise.
 - H. **Perform:** The word "perform" shall be understood to mean that the Contractor, at his expense, shall perform all the operations necessary to complete the Work or mentioned portions of the Work, including furnishing and installing materials as are indicated, specified, or required to complete such performance.
 - I. **Provide:** The term "provide" shall be understood to mean that the Contractor, at his expense, shall furnish and install the Work and the mentioned portion of the Work, complete and ready for the intended use. These definitions apply the same to future, present, and past tenses except "provided" may mean "contingent upon" where such is the context.
 - J. **Equal:** Terms such as "equal", "approved equal", "equivalent", and all terms of similar import shall be understood to be followed by the phrase "in the opinion of

the Architect" unless stated otherwise. Refer to Section 01600 Materials and Equipment in Paragraph 1.03 for additional definitions and requirements.

- K. Approval:** Such words as "approved", "approval", "acceptable", "acceptance", or words of similar import shall mean that approval, acceptance, or similar import of the Architect is intended unless stated otherwise.
- L. Submit:** Such words as "submit", "submittal", "submission" and terms of similar import shall include the meaning of the phrase "submit to the Architect for his approval" unless otherwise stated.
- M. Expense:** Such terms as "at no extra cost to Owner", "with no extra compensation to Contractor", "at Contractor's expense", or phrases of similar import shall be understood to mean that the Contractor shall perform or provide the operation or Work with no increase to the Contract Sum stated in the Agreement.
- N. Fees and Charges:** To the extent indicated or specified, Contractor shall secure the permits, governmental authorizations, utility fees, licenses, inspections, and all similar requirements and shall pay all costs relating thereto no matter how such costs are defined by the political subdivision, public authorities or agencies, public utilities, telephone company, special district, quasi-governmental entity, or other agency involved.
- O. Language:** Specifications are written in a modified brief style consistent with clarity. Generally, the words "the", "shall", "will" and "all" are not stated. Words requiring an action or performance, such as "perform", "provide", "erect", "install", "furnish", "connect", "test", "coordinate", and words and phrases of similar import, shall be understood to be preceded by the phrase "The Contractor shall" unless otherwise stated. The requirements indicated and specified apply to all Work of the same kind, class, and type, even though the word "all" is not stated.
- P. Titling and Arrangement:** Article, Paragraph, and Subparagraph titles and other identifications of subject matter in the Specifications are intended as an aid in locating and recognizing various requirements in the Specifications. Except where titling forms a part of the text, such as beginning words of a sentence or where the title establishes the subject, the titles are subordinate to and do not define, limit, or otherwise restrict the Specification text. Underlining or capitalizing of any words in the text does not signify or mean that such words convey special or unique meanings having precedence over any other part of the Contract Documents. Specification text shall govern over titling and shall be understood to be and interpreted as a whole. The order of Articles, Paragraphs, Subparagraphs, and Sub-subparagraphs in the Specifications text is defined by the sequence of indentations.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01048

CONTRACTOR'S REQUESTS FOR INFORMATION

PART 1 - GENERAL

1.01 DESCRIPTION: All other sections of Division 1 apply to this Section. This Section covers the general requirements for Contractor's Requests for Information, and pertains to all portions of the contract documents.

A. Related Work Specified Elsewhere:

1. Project Meetings - Section 01200
2. Submittals - Section 01300

1.02 DEFINITION: Request for Information, a document submitted by the Contractor requesting clarification of a portion of the contract documents, hereinafter referred to as RFI.

1.03 CONTRACTOR'S REQUESTS FOR INFORMATION:

- A. When the Contractor is** unable to determine from the contract documents, the exact material, process or system to be installed, the Engineer shall be requested to make a clarification of the indeterminate item. Wherever possible, such clarification shall be requested at the next appropriate project meeting, with the response entered into the meeting minutes. When clarification at the meeting is not possible, either because of the urgency of the need, or the complexity of the item, Contractor shall prepare and submit an RFI to the Engineer.
- B. Contractor shall endeavor** to keep the number of RFI's to a minimum. In the event that the process becomes unwieldy, in the opinion of the Engineer, because of the number and frequency of RFI's submitted, the Engineer may require the Contractor to abandon the process and submit all requests as either submittals, substitutions or requests for change.
- C. RFI's shall be submitted** on a form provided by, or approved by, the Engineer. Forms shall be completely filled in, and if prepared by hand, shall be fully legible after copying by xerographic process. Each page of attachments to RFI's shall bear the RFI number in the lower right corner.
- D. RFI's from subcontractors** or material suppliers shall be submitted through, reviewed by, and signed by the Contractor prior to submittal to the Engineer.
- E. Contractor shall carefully** study the contract documents to assure that the requested information is not available therein. RFI's which request information available in the contract documents will not be answered by the Engineer.

- F.** In all cases where RFI's are issued to request clarification of coordination issues, for example, pipe and duct routing, clearances, specific locations of work shown diagrammatically, and similar items, the Contractor shall fully lay out a suggested solution using drawings or sketches drawn to scale, and submit same with the RFI. RFI's which fail to include a suggested solution will not be answered.
- G.** RFI's shall not be used for the following purposes:
1. To request approval of submittals
 2. To request approval of substitutions,
 3. To request changes which entail additional cost or credit.
 4. To differentiate methods of performing work than those drawn and specified.
- H.** In the event the Contractor believes that a clarification by the Engineer results in additional cost, Contractor shall not proceed with the work indicated by the RFI until a change order is prepared and approved. Answered RFI's shall not be construed as approval to perform extra work.
- I.** Unanswered RFI's will be returned with a stamp or notation: Not Reviewed.
- J.** Contractor shall prepare and maintain a log of RFI's, and at any time requested by the Engineer, Contractor shall furnish copies of the log showing all outstanding RFI's. Contractor shall note all unanswered RFI's in the log.
- K.** Contractor shall allow for 14 days review and response time for RFI's.

PART 2 – PRODUCTS - Not applicable to this Section.

PART 3 – EXECUTION - Not applicable to this Section.

END OF SECTION

SECTION 01049

SUPPORTING FROM BUILDING STRUCTURE

PART 1 - GENERAL

1.01 CONDITIONS & REQUIREMENTS:

- A.** **The requirements of this** Section relate to various requirements of the Agreement, General and Supplementary Conditions, Specifications, Drawings and all modifying documents which are part of the Construction Contract. Responsibility for coordination of all such applicable requirements shall be that of the Contractor. Refer to the General Conditions, Supplementary Conditions, and General Requirements.

1.02 DESCRIPTION:

- A.** **This section provides** guidelines and limitations for supporting all mechanical, electrical, plumbing, equipment or architectural items from the building structure, and for seismic bracing for all such items.
- B.** **Design and install all** support and bracing systems except as noted. Provide for attachment to portions of the building structure capable of bearing the loads imposed. Design systems to not overstress the building structure.
- C.** **The Contractor is not** required to design support and bracing for items for which the contract documents provide specific attachment, support, and bracing. Seismic bracing is not required for the following items:
1. Gas piping less than 1" inside diameter.
 2. All other piping less than 2.5" inside diameter, unless racked together.
 3. All piping and duct suspended by individual hangers 12" or less in length.
 4. All rectangle air handling ducts less than 6 square feet in cross sectional area.
 5. All round air handling ducts less than 28" in diameter.
 6. All electrical conduits less than 2.5" inside diameter, unless racked together.

1.03 QUALITY ASSURANCE

- A.** **Design and install** all support systems to comply with the seismic zone 4 requirements of the 2007 California Building Code (CBC) Chapter 16.
- B.** **For seismic bracing** design and gravity support design use the services of a professional engineer licensed in California.

- C. **For seismic bracing** for mechanical, electrical and plumbing systems, refer to the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA), "Seismic Restraint Manual: Guidelines For Mechanical Systems" for guidelines.

1.04 SUBMITTALS:

- A. **Submit shop drawings** for all substructures and attachment methods.
- B. **Submit proposed alternative** methods of attachment for review and approval by the Architect, prior to deviating from the requirements given below.
- C. **For all seismic bracing** systems and gravity support systems, submit structural calculations and details prepared and signed by the Contractor's licensed professional engineer which include all resultant forces applied to the building structure. Do not overstress the building structure. Calculations will be reviewed for compliance with design criteria only.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. **Furnish all substructures** and fasteners required to comply with the limitations given below. Use materials as specified in the various sections and as appropriate to the use.
- B. **Channel framing systems:** as specified in Section 05500.
- C. **All exterior materials:** hot dipped galvanized or stainless steel.

PART 3 - EXECUTION

3.01 GUIDELINES & LIMITATIONS:

- A. **The General Contractor** shall coordinate the load requirements from all subcontractors so that no combination of loads exceeds the limitations given below.
- B. **Wood Structure:**
 - Support no loads from plywood deck.
 - At 2x4 or other stiffeners of roof panels, hang no loads.
 - At GLB girders, hang no loads greater than 200 pounds without consultation.
 - For multiple loading (on girder or from incoming purlin) submit drawings for Architect's review.
 - At floor joists, a concentrated load of 150 pounds maximum may be placed

anywhere along the span.

Place all fasteners for hanger support within the middle 1/3 of the member depth.

Total loads superimposed on the roof structure shall not exceed the equivalent design loading of 4.5 pounds/square foot.

3.02 SEISMIC BRACING:

- A. **In applying formulae** (32-1) or (32-2) from Chapter 16 of the 2007 CBC the value for "Ip" (importance factor) shall be assumed to be no less than 1.5, unless a higher value is required by the CBC.
- B. **Design and install** seismic bracing so as not to ground out vibration and sound isolation items.
- C. **All items of mechanical** and electrical equipment shall be seismically braced whether such bracing is shown or not.

END OF SECTION

SECTION 01060

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 and this Section covers general requirements for codes and standards pertaining to the Work and is supplementary to the codes and standards mentioned or referenced elsewhere in the Contract Documents.

1.02 CODES AND STANDARDS:

A. Requirements of Regulatory Agencies: All pertaining statutes, ordinances, laws, rules, codes, regulations, standards, and lawful orders of public authorities having jurisdiction of the Work of this Contract are hereby incorporated into the Contract Documents the same as if repeated in full herein and are intended wherever reference is made in either the singular or plural to Code or Building Code except as otherwise specified, including, but not limited to, those in the following listing. Contractor shall make available at the site such copies of the listed documents applicable to the Work as Architect or Owner may request, including mentioned portions of the California Code of Regulations (CCR).

1. 2007 California Building Code of jurisdiction including any amended requirements by the City of Torrance Building Department approvals for materials, equipment, systems, and designs as applicable to the Work.
2. Title 8 CCR, Industrial Relations, including Chapter 4, Div. of Industrial Safety, Safety Orders (CAL/OSHA).
3. Title 19 CCR, Public Safety.
4. Title 22 CCR, Social Security.
5. 2007 CBC Title 24, Building Standards, including ADA regulations, architectural barrier laws and regulations regarding disabled persons.
6. 2007 CBC and Local Mechanical Codes.
7. 2007 CBC and Local Plumbing Codes.
8. Local and State Elevator Codes.
9. 2007 CBC and Local and 1998 National Electrical Codes.
10. 2007 CFC and Current Edition of National Fire Protection Association.
11. State and Local Public Health Codes.
12. (SSPWC) Standard Specifications for Public Works Construction, Current Edition.
13. All other laws, regulations, rules, orders, codes, and ordinances specified in other Sections of these Specifications or bearing on the Work.

END OF SECTION

SECTION 01070

ABBREVIATIONS

PART 1 - GENERAL

- 1.01 DESCRIPTION: This Section covers abbreviations for the documents mentioned or referenced elsewhere in the Contract Documents, and language abbreviations used in the text of the Specifications. Abbreviations in Drawings and Specifications shall be interpreted according to recognized and well-known technical, industry, or trade meanings.
- 1.02 TRADE ABBREVIATIONS include but are not limited to the following:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Traffic Officials
ACI	American Concrete Institute
ADC	Air Diffusion Council
AEIC	Association of Edison Illuminating Companies
AFBMA	Anti-Friction Bearing Manufacturers Association
AFI	Air Filter Institute
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AIA	American Institute of Architects
AIMA	Acoustical and Insulating Materials Association
AISC	American Institute of Steel Construction, Inc.
AISI	American Iron and Steel Institute
AMCA	Air Moving and Conditioning Association, Inc.
ANSI	American National Standards Institute
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWPB	American Wood Preservers Bureau
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
CBM	Certified Ballast Manufacturers
CCR	California Code of Regulations (Formerly CAC)
CDA	Copper Development Association
CGA	Compressed Gas Association

CISPI	Cast-Iron Soil Pipe Institute
CS	Commercial Standard, US Department of Commerce
CTI	Cooling Tower Institute
DEMA	Diesel Engine Manufacturers Association
DOD-	Department of Defense (leading symbol)
EIA	Electronic Industries Association
ETL	Electrical Testing Laboratories
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
Fed Spec	Federal Specification or Standard
FIA	Factory Insurance Association
FM	Factory Mutual
HI	Hydraulic Institute
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IPCEA	Insulated Power Cable Engineers Association
ISO	International Standards Organization
MIL	Military Specification or Standard (leading symbol)
MSS	Manufacturers Standardization Society
NAAMM	National Association of Architectural Metal Manufacturers
NAFM	National Association of Fan Manufacturers
NBS	National Bureau of Standards
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFC	National Fire Code
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
NWWDA	National Wood Window and Door Association
OSA	Office of the State Architect
PDI	Plumbing and Drainage Institute
PS	Product Standard, US Department of Commerce
REA	Rural Electrification Administration
RIS	Redwood Inspection Service
SAE	Society of Automotive Engineers
SDI	Steel Door Institute
SFM	State Fire Marshal
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Steel Structures Painting Council
UL	Underwriters' Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau
WIC	Woodwork Institute of California
WWPA	Western Wood Products Association

1.03 TEXT ABBREVIATIONS include but are not limited to the following:

AMP or amp	Ampere
CFM or cfm	Cubic feet per minute
FPM or fpm	Feet per minute
FPS or fps	Feet per second
GPM or gpm	Gallons per minute
Kip or kip	Thousand pounds
Ksi or ksi	Thousand pounds per square inch
Ksf or ksf	Thousand pounds per square foot
KV or kv	Kilovolt
KVA or kva	Kilovolt amperes
KW or kw	Kilowatt
KWH or kwh	Kilowatt hour
LF or lf	Linear foot
MPH or mph	Miles per hour
PCF or pcf	Pounds per cubic foot
PSF or psf	Pounds per square foot
PSI or psi	Pounds per square inch
SF or sf	Square foot
SY or sy	Square yard

PART 2 - PRODUCTS (Not applicable to this Section)

PART 3 - EXECUTION (Not applicable to this Section)

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers the general requirements and procedures for submittals.

A. Submittal Requirements In This Section:

1. Schedule of submittals and transmittals.
2. Deviations.
3. Contractor's review and approval.
4. Corrections and resubmittals.
5. Review and approval.
6. Shop Drawings, samples, and product and equipment data.
7. Manufacturers' instructions.
8. Materials furnished under standard specifications.
9. Certificates.

B. Submittal Requirements Not In This Section:

1. Performance and payment bonds, insurance - Conditions of the Contract.
2. Record Drawings, manuals, and maintenance materials - Section 01700.
3. Warranties and guarantees - Section 01740.

1.02 GENERAL SUBMITTAL REQUIREMENTS: Submit to the Architect all submittals required herein, under other Sections, or by Modifications except as otherwise indicated, specified, or directed. Submittals shall be correctly prepared, identified, and transmitted as specified herein or as otherwise directed. Prepare submittals according to the requirements herein and as may be specified in other Sections.

A. Conformance: Do not purchase or commence any Work covered by a submittal until the pertaining submittal is approved. Work shall conform to approved submittals and all other requirements of Contract Documents unless revised by Modification, in which case submit revised submittals as directed or required at no extra cost to the Owner. Do not start related Work affected by Work covered in submittals until applicable submittals are approved, especially where machinery, equipment, piping, conduit, and required arrangements and clearances are involved.

B. Schedule of Submittals: Submit within 10 days of the Award of the Contract, the Progress Schedule submitted by the Contractor shall include an itemized listing of all required submittals with a scheduled date for each submittal, and shall allow reasonable times for review by the Architect and various Consultants plus time for delivery or return. Contractor shall consult with Architect regarding

major and/or large submittals and time periods required by the Architect for the reviews prior to preparation of the Progress Schedule. Extension of the Contract Time will not be granted because of the Contractor's failure to make timely and correctly prepared and transmitted submittals with an adequate and approved time allowance for the checking and review periods.

- C. Transmittals:** Deliver submittals with a dated and sequence numbered transmittal letter typed on Contractor's letterhead, noted as to the initial or resubmittal status, and describing the submittal contents. Submittals are not acceptable directly from Subcontractors, suppliers, or manufacturers. In each transmittal state the Drawing numbers and Specification Section, Articles, and Paragraphs to which the submittal pertains and identify accompanying data, catalogs, drawings, sketches, and brochures in the same manner. Include Transaction Log on Transmittal Form i.e

To Architect: (Date)____
To Consultant: _____
From Consultant _____
To Contractor _____

- D. Deviations:** Notify the Architect in the transmittals of all deviations from the requirements of the Contract Documents. Fully describe each deviation and all other changes required to correlate the Work including the related Work. State in writing all variations in costs caused by each deviation and the Contractor's assumption of costs for the deviation and of all related costs if any deviation is approved.
- E. Contractor's Review and Approval:** Every submittal upon which proper execution of the Work is dependent shall bear the Contractor's review and approval stamp, dated and signed by Contractor in every case, certifying that Contractor (a) has reviewed, checked, and approved the submittal and has coordinated (missing dimensions or information requested on Submittal) the submittal contents with requirements of the Work and Contract Documents including related Work, (b) determined and verified quantities, field measurements, construction criteria, materials, equipment, catalog numbers and identifications, and similar data, or will do so, and (c) states that Work illustrated or described in the submittal is recommended by Contractor and that Contractor's warranty will fully apply thereto.
- F. Corrections and Resubmittals:** Contractor shall make corrections required by the Architect, resubmit corrected submittals until they are approved, shall direct specific attention in writing to all revisions other than corrections called for on previous submittals, and shall state in writing all changes in costs for such revisions and assumption of all costs for revisions and related changes the same as is required for deviations in Paragraph "Deviations".

- G. Check of Returned Submittals:** Contractor shall check and review the submittals returned for correction and ascertain whether the required corrections result in extra cost above that included in the Contract, and shall give written notice to the Architect within 5 working days if, in the Contractor's opinion, extra costs result from corrections. The Contractor's failure to give such written notice or the starting of any Work covered by a returned submittal constitutes a waiver by the Contractor of claims for extra costs resulting from required corrections.
- H. Review And Approval Of Submittals By The Architect:** Submittals will be reviewed with reasonable promptness, but only for conformance with the design concept of the Project and with the information indicated on the Drawings and stated in the Specifications. Approval of a separate item as such will not indicate approval of the assembly in which the item functions. Approval of submittals shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents or for any revision in resubmittals unless Contractor has given written notice of such deviation or revision at the time of submission or resubmission and written approval has been given to the specific deviation or revision, nor shall approval relieve the Contractor of responsibility for errors or omissions in the submittals or for the accuracy of dimensions and quantities, the adequacy of connections, and the proper and acceptable fitting, execution, functioning, and completion of the Work.
- I. Incomplete Or Inadequate Submittals,** including those not correctly transmitted, titled, and identified, or not bearing Contractor's review and approval stamp, will be returned to the Contractor without review.
- J. Interrelated Submittals:** Except where the preparation of submittal information is dependent upon the approval of any prior submittal, all submittals pertaining to the same class or portion of the Work shall be submitted simultaneously.
- K. Expense:** All cost for the preparation, correction, delivery, and return of the submittals shall be borne by Contractor.

1.03 SUBMITTAL REQUIREMENTS FOR COMMISSIONING

- A. Normal Submittals:**
1. The Commissioning Authority will receive a copy of the normal submittals for equipment to be commissioned.
 2. The Commissioning Authority will review normal Contractor submittals applicable to systems being commissioned for compliance with commissioning needs, concurrently with review by the Architect and Responsible Engineer.

B. Data for Commissioning:

1. The Contractor will receive a written request from the Commissioning Authority requesting specific information needed about each piece of commissioned equipment or system. This will include detailed manufacturer installation and start-up, operating, troubleshooting and maintenance procedures, full details of any owner-contracted tests, fan and pump curves, full factory testing reports and full warranty information, including all responsibilities of the Owner to keep the warranty in force clearly identified. In addition, the installation and checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the Commissioning Authority.
2. The Commissioning Authority may request further documentation necessary for the commissioning process.
3. This data request may be made prior to normal submittals.
4. Much of this information is contained in the regular O&M manual submittals normally submitted in the project and is required prior to the regular formal O&M manual submittals.

C. Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Commissioning Authority's review.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 SHOP DRAWINGS: Prepare each submittal complete including all dimensions, design criteria, materials, connections, bases, foundations, anchors, and the like, and further including such technical and performance data as is necessary to confirm the information in the Shop Drawings. Issue Shop Drawings as a PDF File or Hard Copy. Cad Files may or may not be available, contact Architect for availability and fee required.

Copies of the Contract Drawings marked to show Shop Drawing information are not acceptable and will be returned to the Contractor unreviewed. Each Shop Drawing shall have an adequate title block showing the following identification:

- Name and address of the Work.
- Name and address of the Contractor.
- Name and address of the Subcontractor, Subsubcontractor, manufacturer, supplier, or distributor, as applicable.
- Name and address of the Architect.
- Date, scale of drawings, and identification number.
- Contractor's review and approval stamp, dated and signed.

- A. Initial and Resubmittals:** Submit Shop Drawings in sets consisting of one reproducible and three blue-line prints.
- B. Correction and Approval of Shop Drawings:** The Architect will mark corrections, notations, or approval on printed sheets and return them to the Contractor. Resubmit in same manner if Shop Drawings are not approved.
- C. Final Distribution:** Furnish and distribute prints of approved Shop Drawings as required for performance of the Work.

3.02 **SAMPLES:** Unless otherwise specified, each submittal shall include (4) Four complete sets of Samples. Two sets of approved Samples and all disapproved Samples will be returned to Contractor. Samples of value retained by Architect will be returned to Contractor after completion of the Work if the Contractor's first transmittal for the Sample requests its return. Approved Samples of items returned to Contractor may be installed in the Work if the location is recorded and the Samples bear temporary identification as such.

3.03 **PRODUCT AND EQUIPMENT DATA SUBMITTALS:**

- A. Product Data** shall include materials lists, catalogs, brochures, performance and technical data, service history, characteristics, and like information to fully describe the products covered by the submittal.
 - 1. Submittal Preparation. Bind submittal copies with sturdy labeled covers and include a typed index listing the contents. Loose or unbound submittals will be returned unreviewed. For each item listed, include the manufacturer's name and address, the trade or brand name, all conditions of manufacturer's guarantee and warranty, information to fully describe each item, and supplementary information as may be required for approval. Mark clearly and completely cuts, brochures, and data to indicate the items proposed and the intended use.
 - 2. Product Data Submittals. Unless otherwise specified, every submittal shall include four bound copies. One copy will be returned to the Contractor marked to show the required corrections or approval. If corrections are required, the final submittal shall include four bound corrected copies.
- B. Equipment Data:** Submit complete technical, performance, and catalog information for every item of mechanical and electrical equipment and machinery proposed for installation in the Work, bound, indexed, and containing information and data as required in Paragraph "Product Data" above. Include information on performance and operating curves, ratings, capacities, characteristics, power efficiencies, manufacturers' standard guarantees and warranties with the terms and conditions fully described, and all other information to fully illustrate and describe the items as may be specified or required for

approval. Submit in sets which cover complete systems or functioning units. Unless otherwise specified, submittals shall be as specified in Subparagraph "Product Data Submittals". If applicable, incorporate the equipment data into and submit with the manuals specified under Section 01700.

- 3.04 MANUFACTURERS' INSTRUCTIONS: Submit manufacturers' installation instructions and directions for materials specified to be installed in accordance with such instructions to demonstrate the adequacy of the instructions. Furnish copies to all trades involved.
- 3.05 MATERIALS FURNISHED UNDER STANDARD SPECIFICATIONS: For materials specified by reference to standard or reference type specifications, prepare and submit for approval a list of such materials by manufacturer's names and identifications to the extent requested by the Architect or Owner.
- 3.06 CERTIFICATES: Deliver all certificates to Architect. Each certificate required under the Contract Documents shall be signed by the individual, officer, or the agent lawfully authorized to execute the certificate, and such authority shall be cited in the certificate by title, description, or other acceptable evidence. All certificates shall be sworn and notarized as to the correctness and validity of the contents, and copies shall be notarized to be true copies.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers general requirements for quality control of the Work, including testing and inspection procedures.

A. Requirements In This Section:

1. Testing laboratory or agency.
2. Geotechnical (Soils or Foundation) Engineer.
3. Coordination of tests and inspections.
4. Test costs and reports.
5. Inspections, continuous and special.
6. Contractor-furnished assistance.
7. Verification of conditions.

B. Requirements Not In This Section:

1. Specific test procedures in other Sections to be performed in accordance with this Section.
2. Testing of electrical work.
3. Testing of materials specified to be tested by other agencies under other Section.

1.02 GENERAL QUALITY CONTROL REQUIREMENTS:

- A. General Test Requirements:** Materials to be furnished under the Contract are subject to testing and inspection for compliance with requirements of Drawings and Specifications.
- B. Testing Laboratory or Agency** shall be the licensed Testing Laboratory or Agency, being acceptable to the City having jurisdiction and certified as meeting the requirements of ASTM D3666, D3740, E329, E543, and E548 as applicable to the Work and approved by the Owner, and referred to hereafter as the Testing Laboratory. Perform all testing under supervision and control of a California registered professional engineer employed by Testing Laboratory.
- C. Soils or Foundation Engineer** will be the registered professional Geotechnical Engineer employed and paid by Owner.
- D. Disqualified Material:** Any material shipped or delivered to the site by the Contractor from the source of supply prior to having satisfactorily passed the required testing and inspection, or prior to the receipt of a notice from the

Architect that such testing and inspection will not be required, shall not be incorporated in the Work.

1.03 COORDINATION OF TESTS AND INSPECTIONS: Contractor shall initiate and coordinate testing and inspections required by Contract Documents and public authorities having jurisdiction of the Work.

A. **Notification:** Contractor shall notify the Owner a sufficient time in advance of the manufacture of material to be supplied by him which, by requirements of the Contract Documents, must be tested at the source of supply in order that the Owner may arrange for the testing.

1.04 TEST SAMPLES AND PROCEDURES:

A. **Test Samples:** Furnish and deliver Samples of materials to be tested at no extra cost to Owner. Test samples will be selected by the Architect, Inspector, or Testing Laboratory and not by the Contractor.

B. **Test Procedures:** Testing Laboratory shall perform tests according to ASTM or other methods of test specified for the various materials under other Sections. If no procedure or test method is specified, testing shall conform to material specification referenced unless otherwise directed by Architect. The Testing Laboratory shall tag, seal, label, record, or otherwise suitably identify the materials for testing and no such materials shall be used in the Work until the test result reports are submitted and approved, excepting only the materials specified to be placed or installed prior to testing.

C. **Test Repeating:** Repeat applicable tests at specified intervals, whenever the source of supply is changed, or whenever the characteristics of the materials change or vary in the opinion of Owner or Architect.

1.05 TEST COSTS: Owner will pay for testing performed by Testing Laboratory except Contractor shall reimburse the Owner for retesting costs caused by failure of materials to pass initial tests. Contractor shall arrange and pay for all other testing.

1.06 INSPECTION AND TEST REPORTS: Furnish copies of each inspection and test result report, signed and certified by the Testing Laboratory supervising engineer, as follows:

	Copies
Owner	1
Architect	1
Structural Engineer (structural inspection and test only)	1
Contractor	2
Building Department	1

1.07 INSPECTIONS, CONTINUOUS AND SPECIAL:

- A. Inspections**, continuous and special, shall be performed by Registered Deputy approved by Agency, or Special Inspectors (hereinafter referred to as the Inspector) as required by the Contract Documents and Building Code. During course of Work under inspection, each Inspector shall submit detailed reports relative to progress and condition of Work including variances from the Contract Documents, and stipulating dates, hours, and locations of the inspections.
- B. Inspection Costs:** Owner will employ Inspector and pay for required continuous and special inspections.
- C. Reimbursement of Inspection Costs:** The Contractor shall reimburse to the Owner all or any part, as the Owner may deem just and proper, of the actual excessive inspection costs incurred by the Owner due to any or all of the following:

 - 1. Contractor's failure to complete the Work within the Contract Time stated in the Agreement, and any previously authorized extensions thereof.
 - 2. Claims between separate contractors.
 - 3. Covering of any of the Work before the required inspections or tests are performed.
 - 4. Extra inspections required for Contractor's correction of defective Work.
 - 5. Overtime costs for acceleration of Work done for Contractor's convenience.
- D. Approvals Required by Others:** If the laws, ordinances, rules, regulations, or orders of any public agency having jurisdiction require any of the Work to be specifically inspected, tested, or approved by some authority other than the Owner, Architect, or Contractor, the Contractor shall give all required notices and make all arrangements, shall deliver to the Architect the certificates of inspection, testing, or approval of such public agency, and shall pay all costs therefor unless otherwise provided in the Contract Documents.

1.08 CONTRACTOR-FURNISHED ASSISTANCE: Whenever requested, Contractor shall furnish access, facilities, and labor assistance as necessary for duties to be performed at the site by Testing Laboratory and Inspector including furnishing ladders, hoisting, temporary lighting and water supply, and like services.

1.09 VERIFICATION OF CONDITIONS: Prior to installation of any portion of the Work, the installing Contractor, Subcontractor, or Sub-subcontractor shall inspect the Work in place to receive the Work to be installed and arrange for correction of defects in the existing workmanship, material, or conditions that may adversely affect Work to be installed. Such inspections shall include test applications of the materials to be installed as required to establish the correct condition of surfaces involved. Installation of materials on Work in place constitutes acceptance by the installing

Contractor, Subcontractor, or Sub-subcontractor of such Work in place as being in proper condition to receive the materials to be applied and waiver of claim that the Work in place is defective as pertains to warranty requirements, excluding unascertainable or concealed conditions. Where the Specifications require a material to be installed under the supervision or inspection of the material manufacturer or his representative, manufacturer or his representative also shall inspect the Work in place and issue a letter of approval to Architect.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 TESTS AND INSPECTIONS: Contractor will pay for the following testing and inspections except as stated otherwise for specific items.

A. Concrete Work:

1. Mix design of concrete - costs paid by Contractor.
2. Conformance testing of materials - costs paid by Contractor.
3. Casting and testing of cylinders.
4. Inspector during construction of Tilt-up panel formwork
5. Inspector during placing of concrete.

B. Reinforcing Steel:

1. Review and approval of mill certificates.
2. Conformance testing of bars - costs paid by Contractor.
3. Inspector for welding of bars.
4. Inspector during placement of bars.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers general requirements for construction facilities and temporary controls for the Work.

A. Work In This Section: Principal items include:

1. Temporary barricades.
2. Temporary storage facilities.
3. Temporary offices and telephones.
4. Temporary toilet facilities.
5. Temporary utility services.
6. Temporary facilities for Work in existing buildings.
7. Removal of temporary facilities.
8. Construction project sign.

1.02 GENERAL: Drawings indicate building site and related areas of Owner's property available for the Work. Keep areas orderly, free of hazards, and leave in clean condition acceptable to Architect, Owner, and governing public authorities.

PART 2 AND 3 - PRODUCTS AND EXECUTION

2.01 TEMPORARY BARRICADES: Provide solid or fencing type barricades. Construct and relocate or alter as required by the Owner, Architect, Code, or public authorities having jurisdiction. Paint solid barricades exposed to public view with 2 coats of paint in colors designated by Architect. Secure and pay for building and street use permits and inspections required by Code.

2.02 TEMPORARY STORAGE FACILITIES: Provide temporary storage facilities necessary to protect materials and equipment delivered to site from damage. Maintain sheds in a clean and sightly condition. Distribute all materials stored in permanent structures to prevent overloading of floors or structure. If on-site storage area is inadequate, arrange and pay for necessary off-site facilities.

2.03 OFFICES AND TELEPHONES: Provide office space on site as required. Office may be temporary construction but waterproof, weathertight, insulated, well lighted, floored, heated, air conditioned and accessible to Owner, Architect, and their representatives; approved mobile units having equivalent facilities may be furnished and equipped with an adequate table, plan rack, desk, and chairs, and a non-pay telephone and fax for business use without charge. The office, equipment, and furniture shall remain the property of the Contractor.

- 2.04 PROJECT SIGN: If allowed by Owner, provide a sign of 3/4" x 4'-0" x 8'-0" (maximum size) exterior grade Douglas fir plywood face with a rigid frame, having painted background and lettered name of the project and names of Owner, Architect, and Contractor in accordance with sketches prepared by the Architect. Place no other signs on or adjacent to premises. Locate sign where directed. Obtain and pay for building permit for sign, if required by Code.
- 2.05 TOILET FACILITIES: Install temporary toilets for workmen and maintain toilets in a clean and sanitary condition. Locate as approved and connect to existing sewers when feasible. Chemical toilets may be used if approved by local Code.
- 2.06 UTILITY SERVICES: Send proper notices, make necessary arrangements, provide services required in care and maintenance of public utilities, and assume the responsibility concerning same for which Owner may be liable. Do all necessary enclosing or boxing in for protection of public utilities. Upon completion of the Work, remove enclosures, fill in openings in concrete or masonry with like materials, grout watertight, and leave in finished condition. **Utilities serving other Buildings shall remain in service at all times.**
- 2.07 TEMPORARY FACILITIES FOR WORK IN EXISTING BUILDINGS:
- A. Noise and Dust Control Barriers:** Prior to start of Work, coordinate with Owner as to location for barriers to ensure that no interference is caused to use of occupied portions of buildings.
1. Barriers. To the extent indicated or directed, provide dustproof and sound deadening barriers between new Work areas and occupied portions of the existing facilities before Work is commenced. Construct barriers of 1/2" thick gypsum wallboard or minimum 1/4" thick plywood on a wood frame, or equal. Provide a filler of 2" thick batt insulation and a ply of kraft paper. Seal joints in barriers and to existing work with a pressure sensitive masking tape. Maintain barriers in a clean, neat, dustproof and sound deadened condition until their need is fully satisfied and removal is approved or directed by Owner. Install doors with weatherstripping and locking hardware where directed by the Owner. Locate all barriers so as not to obstruct use of existing room doors, doors to existing stairways, or access to and through legal exitways.
 2. Temporary Filters. Provide temporary filters over existing air conditioning or ventilating return air systems where dust or fumes may spread from new Work areas into existing buildings. Use approved commercial viscous-coated throwaway filters, or equal. Clean existing ducts and plenums that are soiled from lack of proper protection as directed, at no extra cost to Owner.
- B. Toilet Facilities:** Existing facilities are not to be used by workmen on the Work or other personnel of the Contractor, unless otherwise designated by the Owner. The toilets are for City personnel only.

- C. **Interior Traffic Signs:** Post signs in existing facilities to re-route occupants to legal exits where such have been closed with prior permission of Owner.

- D. **Interior Traffic Control:** Provide foot traffic control barriers in corridors, passages, and lobbies to be used by occupants during the Work. Erect barriers before starting Work in the involved areas and relocate as the Work progresses. Allow for space outside the barriers sufficiently wide to permit foot traffic in both directions without congestion. Return barriers across working area to both sides of doorways that are to remain in use. Furnish barriers of wood or metal posts with weighted bases and connected by rope guards, or equivalent. Provide suitable warning signs on posts at both ends of barrier runs and as required elsewhere. Keep debris and materials out of walking areas.

- E. **Temporary Utilities:** Owner will furnish electrical power, water, and gas from existing outlets designated by Owner without charge to Contractor for quantities used in the Work. Provide all temporary piping, fittings, wiring, and lighting necessary to supply utilities in sufficient quantities at locations required by the Work.
 - 1. **Electrical Power.** Characteristics of current furnished by Owner is limited to that existing and available; if current of other characteristics or quantity is required by Contractor, he shall supply the power as necessary at no extra cost to Owner. Power for small tools and lighting may be taken from existing 120-volt 60 Hz 1-phase convenience receptacles provided there is no disturbance to occupants and functions, cables and conductors do not prevent the closing of fire-labeled doors, and the load connected to any single or duplex outlet does not exceed 12 amperes. Total load connected to any circuit shall not exceed 25% of the circuit capacity as labeled in panelboard. At his expense, Contractor shall repair and make good all damage to existing electrical facilities caused by his use, as directed and approved.
 - 2. **Water.** Owner will furnish water at existing outlets that do not interfere with normal operation of the facilities. In general, obtain water from outlets in janitor and similar utility rooms. If used, do not run hoses down corridors or across doorways in use by occupants. Provide temporary backflow prevention devices as required by Code or directed by Owner.
 - 3. **Gas.** Limit the quantity used to the amount that causes no interference to existing gas-fired devices and equipment.

- F. **Temporary Exterior Closures:** Provide as required to maintain the weatherproof and watertight integrity of the existing facilities.

- G. **Rolling Interior Scaffolds:** Equip rolling scaffolds with pneumatic tires and rubber bumpers to prevent damage to walls and finishes. Except where an entire corridor or space is made available for Contractor's exclusive use, fixed and rolling scaffolds shall occupy no more than one-half the width of the area, and

shall not block doors and doorways in use by occupants. Protect floors with planks or similar material as required to prevent marring or damage.

- H. Control of Construction Water:** Provide impermeable floor coverings and suitable dams to prevent damage by the water used for the Work. Immediately clean up and remove all surplus water and water spilled in non-working areas.

2.08 REMOVAL OF TEMPORARY CONSTRUCTION: Remove all temporary facilities and other construction of temporary nature from site as soon as progress of the Work will permit in opinion of the Architect. When authorized, Contractor may move his facilities into designated areas of completed portions of the building. Upon completion of the Work, recondition and restore portions of site and building occupied by temporary facilities to acceptable condition.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers the general requirements for the materials and equipment for the Work. Specific requirements for materials and equipment are covered under other Sections of the Specifications.

A. Requirements In This Section:

1. Submittals for:
 - a. Factory finish colors.
 - b. Standard materials.
2. Proposed substitutions.
3. Materials, regarding:
 - a. Equal materials.
 - b. Optional materials.
 - c. Plurality of terms.
 - d. Factory finish colors.
4. Transporting and handling.
5. Storage and protection.

1.02 SUBMITTALS: Refer to Section 01300.

A. Submittals for Factory Finish Colors: Whether or not required elsewhere, submit color samples of materials specified to have a factory finish for selection and approval.

B. Submittal for Standard Materials: For the products specified by reference to standard or reference specifications, prepare and submit for approval a list of such materials or equipment by manufacturers' names and identifications to the extent requested by Architect.

1.03 PROPOSED SUBSTITUTIONS: Submit proposed substitutions prior to Bidding to the Architect for approval. Contractor will be notified of the approved substitutions by Addendum. Architect may require the submission of Drawings, Product Data, Samples, and other information in approved form for consideration of proposed substitutions.

A. Approval or Rejection of proposed substitutions is at Owner's discretion, whose judgement will be final and will include consideration of the following factors among others in comparing equality of proposed substitutions with indicated or specified requirements:

1. Quality of materials, structural strength, and details of construction or fabrication.
 2. Performance and function, mechanically and technically.
 3. Appearance and finish, or characteristics permitting required finish to be applied.
 4. If proposed substitutions require altering the arrangement of adjoining or related Work, resulting arrangement must be equal in convenience and practicality to original arrangement.
 5. Products equal in quality and utility are generally competitive products and are generally equal in price. If approval is requested for materials or equipment more economical than the specified products, Owner may require the specified products.
 6. An inequality in availability of replacement parts or maintenance services may be a determining factor.
 7. Code approvals and service history.
- B. Resubmittal of Proposed Substitutions:** Do not resubmit proposed substitutions that are rejected in modified form. Upon rejection of a proposed substitution, Bidder may submit another proposed substitution within the time limit stated above. If the second proposed substitution is rejected or not received by the Architect within the specified time, provide only the indicated and specified Work at no additional cost to Owner.
- C. Compliance:** Use of Approved Substitutions does not relieve Contractor from compliance with the Contract Documents. Contractor shall bear all extra expense resulting from approved substitutions where substitutions affect adjoining or related Work.
- D. Unauthorized Substitutions:** If substitute materials are installed without prior approval, remove all the unauthorized materials and install those indicated or specified, at no extra cost to Owner.

PART 2 - PRODUCTS

2.01 MATERIALS: Provide new materials and equipment unless otherwise indicated or specified.

- A. Equal Materials:** Any material, apparatus, equipment, or process indicated or specified by patent or proprietary name or name of manufacturer shall be deemed to be followed by "or equal as approved in writing by the Architect", unless it is specified that substitutions are not acceptable for a particular material, apparatus, equipment, or process item. Criteria will be the same as above in Paragraph 1.03 (A) 1-7.
- B. Optional Materials:** Where more than one proprietary brand name is specified, Contractor may provide any one of the materials or equipment specified. Before placing orders, advise Architect in writing of each named material,

appliance, or piece of equipment proposed for the Work and its intended use. Provide only one brand, kind, or make of material for each purpose throughout the Work notwithstanding that similar material or equipment of two or more manufacturers may be specified for the same purpose.

- C. Plurality of Terms:** For all materials or equipment referred to in the singular number, it is intended unless otherwise limited that such references apply to as much material or equipment as is required to complete the Work.
- D. Factory Finish Colors:** Color of material specified to be furnished with factory finish is subject to Architect's approval. If available color is not approved, modify factory finish color to conform to the Architect's color instructions or provide another manufacturer's approved product which has an acceptable finish color, at no extra cost to Owner.

PART 3 - EXECUTION

- 3.01 **TRANSPORTING AND HANDLING:** Transport and handle all materials and equipment by methods that prevent damage, defacing, or overstressing. Lift the equipment, machinery and heavy fabricated products only at the lifting points designated by the manufacturer or, if not so designated, at the points or along the members designed to support the items when installed. Contractor shall bear all loss which may result from transporting and handling of materials and equipment and shall provide approved replacements for damaged or defective items at no extra cost to Owner. Conform handling procedures to applicable Codes.
- 3.02 **STORAGE AND PROTECTION:** Materials and equipment designed for permanent weather exposure may be stored off the ground without covering provided the equipment closures and seals are intact. Store all other materials and equipment off the ground and in dry, covered, weather-protected locations. Exercise special care to protect moisture-sensitive materials and other materials damaged by light (ultraviolet) or heat. Arrange adequate ventilation under protective covering to prevent condensation.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers general requirements for contract closeout.

A. Requirements In This Section:

1. Clean up and disposal.
2. Record Drawings.
3. Operation and maintenance manuals.
4. Maintenance materials.

1.02 SUBMITTALS under this Section shall conform to the Article "General Submittal Requirements" of Section 01300.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 CLEAN UP AND DISPOSAL: Requirements herein form a part of all other Sections of the Specifications and shall be coordinated with such additional clean up and disposal requirements as may be specified in other Sections.

A. General: Leave the entire Work broom clean except where vacuum clean or other condition is specified.

1. Control During The Work. Take precautions to avoid spread of dust, dirt, debris, water, paint, cement, sprayed materials, and other substances about the site or to adjacent property. Clean up splatterings or spills of materials at time of occurrence. Remove dirt, debris, waste, and rubbish frequently, and do not allow to accumulate in the structure or on the site. Do not store flammable or toxic materials in the structure.

B. Contractor's Supervision: Inform all trades and workmen of the cleaning up requirements specified, and monitor where Work is in progress to ensure full compliance with all clean up requirements in this and other Sections.

C. Architect's Inspection: Give the Architect at least 3 working days advance notice of readiness for inspection as each phase or area of Work is completed for occupancy. Correct any deficient cleaning operations, as determined and directed by Architect.

- D. Disposal:** The Contractor and all Sub-Contractors shall be required to recycle as much material as possible (per Owners requirements) on this Project prior to disposing in a disposal area. Do not place rubbish or waste material in fills or backfills. Remove debris, rubbish, and waste material from Owner's property to a lawful disposal area and pay all hauling and dumping charges. Conform to pertaining Federal, State, and local laws, ordinances, rules, regulations, and orders.
- E. Final Clean Up - Exterior:** Clean surfaces of construction and site including fixtures, walls, soffits, floors, hardware, roofs, window and opening ledges and sills, horizontal projections, steps and platforms, walkways, rails and all like surfaces, and adjoining private and public property to the extent soiled by the Contractor's operations.
- F. Final Clean Up - Interior:** Leave surfaces in clean condition with all dust, dirt, stains, handmarks, paint spots, droppings, and other blemishes and defects completely removed.
1. Hard Floors: Wash and dry concrete, tile, elastomeric, and similar floors, free of streaks or stains.
 2. Resilient Flooring: Freshly wax and buff as specified in Division 9.
 3. Resilient Bases: Clean off adhesive smears and wipe clean.
 4. Carpet: Vacuum clean free of lint, soil, and dust.
 5. Bare and Painted Surfaces: Clean of dust, lint, streaks, or stains.
 6. Tile Walls: Clean and polish.
 7. Stone Masonry: Clean and polish.
 8. Wall Covering: Remove all adhesive on surfaces.
 9. Hardware and Metal Surfaces: Clean and polish all exposed surfaces using noncorrosive and nonabrasive materials.
 10. Glass: Wash and polish both sides, and leave free of dirt, spots, streaks, and labels. Clean and polish mirrors.
 11. Ceilings: Clean and free of stains, handmarks, and defacing.
 12. Fixtures and Equipment: Clean and polish mechanical and electrical fixtures and like items. Leave lighting fixtures free of dust, dirt, stains, or waste material. Clean and service equipment and machinery, ready for use.
- G. Surfaces Not Mentioned:** Clean according to the intent of this Section and as required for Architect's approval.
- H. Contaminated Earth or Materials:** Final clean up operation includes removal and disposal of earth that is contaminated or unsuitable for support of plant life in planting areas, and filling of resulting excavations with suitable soil as directed and approved. Contaminated areas include those used for disposal of waste concrete, mortar, plaster, masonry, and similar materials, areas in which washing out of concrete and plaster mixers or washing of tools and like cleaning operations have been performed, and all areas that have been oiled, paved, or

chemically treated. Do not dispose of waste oil, solvents, paints, solutions, or similar material of a penetrating nature by depositing or burying on Owner's property.

3.02 RECORD DRAWINGS:

- A. **Record Set During The Work:** At site, maintain at least one set of Drawings as a Field Record Set; apportion copies to the various Subcontractors for recording of their portions of the Work. Also maintain at least one copy of all Addenda, Modifications, approved submittals, correspondence, and transmittals at site. Keep Drawings and data in good order and readily available to Architect, Owner, and their representatives.
- B. **Changes:** Clearly and correctly mark Record Drawings to show all changes made during the construction process at the time the changed Work is installed. No such changes shall be made in the Work unless authorized by a Modification or by specific approval of deviations or revisions in submittals.
- C. **Final Record Drawings:** Prior to Substantial Completion, Architect will order for Contractor, at Contractor's expense, one complete set of Drawings, including Clarification and Interpretation Drawings and the Drawings issued by Addenda, recorded on CAD Files or printed as hard copy prints if required to do so by the Architect or Owner.
- D. **Preparation of Final Record Drawings:** Contractor shall transfer all recorded changes in the Work indicated on the Field Record Set to a reproducible Cad File. Changes for all trades shall be neatly and clearly drawn and noted in ink by skilled draftsmen, and shown technically correct.
- E. **Approval:** Prior to Architect's inspection for Substantial Completion, submit both the Field Record Set and the Final Record Drawings to the Architect for review, and make such revisions as may be necessary for Final Record Drawings to be a true, complete, and accurate record of the Work in the Architect's opinion.
- F. **Conferences:** Contractor and any of the Subcontractors involved shall attend post-construction conferences to clarify the Final Record Drawings as may be required by Architect, at no extra cost to Owner.

3.03 MANUALS: Obtain data from the various manufacturers and submit instruction, operation, and maintenance manuals to the extent required under other Sections of the Specifications.

- A. **Contents:** Each manual shall have an index listing the contents. Information in the manuals shall include not less than (a) general, introductions and overall equipment description, purpose, functions, and simplified theory of operation, (b) specifications, (c) installation instructions, procedures, sequences, and precautions, including tolerances for level, horizontal, and vertical alignment,

(d) grouting requirements including grout spaces and materials, (e) list showing lubricants for each item of mechanical equipment, approximate quantities, needed per year, and recommended lubrication intervals; where possible, the types of lubricants shall be consolidated with equipment manufacturers' approval in order to minimize the number of different lubricants required for maintenance, (f) startup and beginning operation procedures, (g) operational procedures, (h) shut down procedures, (i) short and long term inactivation procedures, (j) repair, maintenance, and calibration instructions, (k) parts lists and all spare parts recommendations, (l) lists of all special tools, instruments, accessories, and special lifting and handling devices required for periodic maintenance, repair, adjustment, and calibration, and (m) other information as may be specified or required for approval.

B. Format and Binding: Include drawings and pictorials to illustrate the text as necessary to fully present the information. Where the information includes a family of similar items, strike out the inapplicable information or identify applicable portions by heavily weighted arrows, boxes, or circles. Bind each manual in sturdy covers labeled to indicate the equipment to which it applies. Bind manuals less than one inch thick in standard three-ring binders; others shall have sturdy covers secured with removable fasteners and, when more than two inches thick, shall be bound in locking-bar post binders with rigid covers.

C. Manual Submittals: Unless otherwise specified, each submittal shall include two copies of each manual, one of which will be returned to the Contractor marked to show the required corrections or approval. When approved, deliver four copies to Architect unless otherwise specified.

3.04 MAINTENANCE MATERIALS: Furnish and deliver all the special tools, instruments, accessories, spare parts, and maintenance materials required by the Contract Documents, and furnish and deliver the special tools, instruments, accessories, and the special lifting and handling devices shown in the instruction manuals approved above. Unless otherwise specified or directed, deliver the items to the Owner, with the Contractor's written transmittal accompanying each shipment, in the manufacturer's original containers labeled to describe the contents and the equipment for which it is furnished. Deliver a copy of each transmittal to Architect for record purposes.

END OF SECTION

SECTION 01740

WARRANTIES AND GUARANTEES

PART 1 - GENERAL

- 1.01 DESCRIPTION: This Section covers general requirements for written warranties and guarantees required by the Contract Documents. Submission to and approval by the Owner of the warranties and guarantees is a prerequisite to final payment under the Contract.
- 1.02 MANUFACTURERS' WARRANTIES AND GUARANTEES: Deliver all the manufacturers' warranties and guarantees required by Contract Documents, with Owner named as the beneficiary. In addition, for all equipment and machinery, or components thereof, bearing a manufacturers' warranty or guarantee that extends for a longer time period than the Contractor's warranty or guarantee, deliver the manufacturers' warranties or guarantees in same manner. Refer to Section 01300, Paragraph "Equipment Data", for the submission of manufacturers' warranty or guarantee data.
- 1.03 FORM OF WARRANTY OR GUARANTEE: All written warranties and guarantees, except manufacturers' standard printed warranties and guarantees, shall be submitted on the Contractor's, Subcontractor's, material supplier's, or manufacturer's own letterhead, addressed to the Owner. All warranties and guarantees shall be submitted in duplicate, and in the form shown on the following page, signed by all pertinent parties and by Contractor in every case, with modifications as approved by Owner to suit the conditions pertaining to the warranty or guarantee.
- 1.04 SUBMISSION OF WARRANTIES OR GUARANTEES: The Contractor shall collect and assemble all written warranties and guarantees into a bound booklet form, and deliver the bound books to Architect for delivery to the Owner's attorney for final review and approval.

WARRANTY/GUARANTEE

FOR _____ WORK

We, the undersigned, hereby warranty and guarantee that the parts of the Work described above which we have furnished and/or installed for:

CITY OF TORRANCE
EL RETIRO LIBRARY
TORRANCE, CALIFORNIA

is in accordance with the Contract Documents and that said Work as installed will fulfill or exceed all of the Warranty and Guarantee requirements. We agree to repair or replace Work installed by us, together with any adjacent Work which is displaced or damaged by so doing, that proves defective in workmanship, material, or operation within a period of _____ () year(s) from the date of final acceptance of by Owner or from the Date of Certificate of Substantial Completion, whichever is the earlier, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above-mentioned conditions within a reasonable time period determined by the Owner, after notification in writing, we, the undersigned, collectively and separately do hereby authorize the Owner to have said defective Work repaired and/or replaced and made good, and agree to pay to the Owner upon demand all moneys that the Owner may expend in making good said defective Work, including all collection costs and reasonable attorney fees.

Date: _____
(Subcontractor, Sub-subcontractor, Manufacturer or Supplier)
By _____
Title _____
State License No. _____

Date: _____
(Contractor)
By _____
Title _____
State License No. _____

Local Representative to be contacted for maintenance, repair and/or replacement service:

Name: _____
Address: _____
Phone Number: _____

WARRANTY/GUARANTEE

FOR _____ WORK

We, the undersigned, hereby warranty and guarantee that the parts of the Work described above which we have furnished and/or installed for:

CITY OF TORRANCE
SOUTHEAST LIBRARY
TORRANCE, CALIFORNIA

is in accordance with the Contract Documents and that said Work as installed will fulfill or exceed all of the Warranty and Guarantee requirements. We agree to repair or replace Work installed by us, together with any adjacent Work which is displaced or damaged by so doing, that proves defective in workmanship, material, or operation within a period of _____ () year(s) from the date of final acceptance of by Owner or from the Date of Certificate of Substantial Completion, whichever is the earlier, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above-mentioned conditions within a reasonable time period determined by the Owner, after notification in writing, we, the undersigned, collectively and separately do hereby authorize the Owner to have said defective Work repaired and/or replaced and made good, and agree to pay to the Owner upon demand all moneys that the Owner may expend in making good said defective Work, including all collection costs and reasonable attorney fees.

Date: _____
(Subcontractor, Sub-subcontractor, Manufacturer or Supplier)
By _____
Title _____
State License No. _____

Date: _____
(Contractor)
By _____
Title _____
State License No. _____

Local Representative to be contacted for maintenance, repair and/or replacement service:

Name: _____
Address: _____
Phone Number: _____

END OF SECTION

SECTION 01900

MISCELLANEOUS WORK

PART 1 - GENERAL

1.01 DESCRIPTION. The requirements of all other Sections of Division 1 apply to this Section. Provide various materials and perform all miscellaneous operations as indicated, specified, and required. This Section applies to all other Sections of the Specifications.

A. Work In This Section: Principal items include:

1. Miscellaneous demolition, cutting, alterations, and repairs to the existing facilities as shown, specified, and required to complete the Work.
2. Relocation and reinstallation of existing construction and finish as shown.
3. Salvage, storage, and protection of existing items to be reinstalled.
4. Salvage and delivery to Owner of designated removed items as directed.

1.02 SUBMITTALS: Refer to Section 01300 for procedures.

A. Schedule of Work: Perform Work in existing facilities during such hours and by methods as are approved by Owner. Submit proposed schedules itemizing dates and hours that the various items of Work in existing facilities will be started and completed. Owner reserves the right to modify proposed schedules to eliminate conflicts and ensure use of existing facilities during the Work. Exactly follow the schedule as finally approved by Owner. No extra payment will be made to the Contractor for the Work required to be performed during night, Saturday, Sunday, or holiday hours. Revise and resubmit schedules when timing or sequence changes occur or are ordered by Owner.

1.03 JOB CONDITIONS:

- A. General:** Coordinate Work among the trades and with Owner to assure the correct sequence, limits, methods, and times of performance. Arrange the Work to impose minimum hardship on operation and use of the facilities. Install protection for existing facilities, contents, and new Work against dust, dirt, weather, damage, and vandalism, and maintain and relocate as Work progresses.
- B. Hazardous Waste Removal:** During inspection and demolition work if any hazardous materials are found the Contractor shall immediately notify the Owner and proper agencies and have the materials removed in an approved manner.
- C. Access:** Confine entrance and exit operations to access routes designated by the Owner.

- D. Existing Portable Items:** Owner will remove portable equipment, furniture, and supplies from involved existing areas prior to start of Work therein. Cover and protect remaining items.
- E. Existing Conditions:** Intent of Drawings is to show existing site and facility conditions with information developed from the original construction documents, field surveys, and Owner's records, and to generally show the amount and type of demolition and removals required to prepare existing areas for new Work.
- F. Verification of Conditions:** Perform a detailed survey of all existing site and building conditions pertaining to the Work before starting Work. Report to the Architect all discrepancies or conflicts between Drawings and actual conditions in writing for clarification and instructions and do not perform Work where such discrepancies or conflicts occur prior to receipt of Architect's instructions.
- G. Special Noise Restrictions:** Exercise caution and care to prevent generation of unnecessary noise and keep noise levels to the minimum possible. When ordered by Owner or Architect, immediately discontinue such methods that produce noise disruptive or harmful to the facility functions and occupants, and perform Work by unobjectionable methods. Equip air compressors, tractors, cranes, hoists, vehicles, and all other internal combustion engine equipment with "residential" grade mufflers. Muffle unloading cycle of compressors. Remove from the site any equipment producing objectionable noise as determined by Owner or Architect.
- H. Shoring and Bracing:** Provide support, shoring, and bracing required to preserve the structural integrity and prevent collapse of existing construction that is cut into or altered as a part of the Work.
- I. Overloading:** Do not overload any part of the structures beyond a safe carrying capacity by placing of materials, equipment, tools, machinery, or any other item thereon.
- J. Building Security:** Secure building entrances and exits with locking or another approved method in accordance with Owner's instructions.
- K. Safeguarding of Owner's Property:** Assume care, custody, and responsibility for safeguarding all of Owner's property of every kind, whether fixed or portable, remaining in rooms and spaces vacated and turned over to Contractor by the Owner for his exclusive use in performing the Work until the Work therein or related thereto is completed and the rooms or spaces are re-occupied by Owner. Furnish all forms of security and protection necessary to protect the Owner's property. Regardless of cause, Contractor shall repair, replace, or otherwise acceptably make good all of the Owner's property under his care, custody, and safeguarding that is damaged, injured, lost, stolen, or missing from the time each such room or space is turned over to Contractor for the Work until re-occupied by Owner, at Contractor's expense and as directed by the Owner.

1. **Property Inventories:** Owner's property that Owner intends to remove will be removed at no cost to Contractor before a room or space is vacated for the Work. Prior to start of Work in each room or space, Owner and Contractor shall prepare a detailed initial written inventory of Owner's property remaining therein and condition thereof, including equipment and telephone instruments, and each party shall retain a copy of the inventory dated and signed by both. In same manner, prior to Owner's re-occupancy of each such room or space the parties shall again inventory Owner's property therein and all discrepancies between the inventories shall be the Contractor's responsibility as specified above.
2. **Covering and Clean-Up:** Cover and protect all surfaces of rooms and spaces turned over for the Work, including the Owner's property remaining therein, as required to prevent soiling or damage by rust, dirt, water, fumes, or otherwise, and protect other areas where Work is performed in the same manner, all as is deemed adequate by the Owner. Prior to Owner's re-occupancy of any such room or space, clean all surfaces including Owner's property in accordance with Section 01700 and other cleaning instructions as may be specified in other Sections.

L. Use of Owner's Telephones: Do not use nor allow anyone other than the Owner's employees to use telephone in rooms and spaces turned over to Contractor for the Work except in the case of a bona fide emergency. Install temporary dial locks on telephone instruments to prevent all unauthorized use, or arrange and pay for temporary removal and reinstallation of instruments. Reimburse to the Owner all telephone toll charges originating from the telephones in such rooms and spaces except those arising from emergencies or use by Owner's employees.

M. Welding: Conform to following requirements where welding is performed in or on existing facilities.

1. **Protection During Welding:** Conform to Title 8, CCR. In addition, protect occupants and the public with portable solid vision barricades around locations where welding is performed plus signs warning against looking at welding without proper eye protection, or equivalent.
2. **Welding Smoke Control:** Attention is directed to existing smoke detectors. Perform welding by methods that produce the minimum feasible smoke and fumes. Furnish portable type smoke collection equipment and supplementary ventilating equipment as required to prevent smoke and fume nuisances. Notify the Owner at least 48 hours in advance if a temporary deactivation of any smoke detector is required to prevent false alarms from welding operations. Owner's personnel will deactivate the detectors only for the period that welding is actually in progress.
3. **Fire Extinguishers:** Maintain a fully charged UL-labeled minimum 10-pound ABC fire extinguisher at every location where welding is performed within the facilities.

4. **Fire Prevention:** Before welding, examine existing construction and backing for combustible materials and finishes and for conditions where heat migration in metals may bring adjoining materials to ignition temperature. Use positive fire prevention measures including the temporary removal and reinstallation of combustible materials, installation of temporary shields and/or heat sinks, and other necessary means. When actual field conditions are such that positive fire prevention measures cannot be achieved, notify Architect and do not proceed with the involved Work until receipt of Architect's instructions.

- N. Protection of Floors:** Exercise caution to protect floor surfaces and coverings from damage. Equip mobile equipment with pneumatic tires.

PART 2 - PRODUCTS (Not applicable to this Section)

PART 3 - EXECUTION

3.01 DEMOLITION, REMOVALS, ALTERATIONS, AND REPAIRS:

- A. Basic Requirement:** Restore all new and existing construction and improvements that are cut into, altered, damaged, relocated, reinstalled, or left unfinished by demolition and removals as a result of the Work to original condition or to match the adjoining Work and finishes and as indicated, specified, directed, and required. Workmanship and materials shall conform to applicable provisions of other Sections of Specifications. Provide new fasteners, connectors, adhesives, and other accessory materials as required to complete approved reinstallations and restorations.
- B. Extent:** Perform demolition and removals to extent shown plus such additional demolition or removal as is necessary for completion even though not indicated. More or less of existing construction may be demolished or removed when such variation will expedite the Work and reduce cost to Owner, subject to approval.
- C. Removals and Demolish:** Carefully demolish and or remove as indicated on Drawings. Carefully remove Work to be salvaged or reinstalled and store under cover.
1. **Walls, Partitions, and Ceilings:** Demolish or remove completely by cutting down and not by tumbling, throwing, or dropping.
 2. **Concrete:** Saw with power saw, or chip where sawing is not practicable, to prevent spalling of concrete to remain. Cut off reinforcing bars, except where bonded into new concrete or masonry, and paint ends with bituminous paint before enclosing.
 3. **Masonry:** Cut back to joint lines and remove old mortar. Allow space for repairs to backing where applicable.
 4. **Plaster:** Cut back to sound plaster on straight lines, and back-bevel edges of remaining plaster. Trim existing lath and prepare for new lath.

5. Roofing: Remove as indicated or required, including insulation, flashings, and related items connected thereto. At penetrations through existing roofing, trim cut edges back to sound roofing with opening of minimum size necessary for new Work.
6. Cabinets, Casework and Woodwork: Demolish, and or carefully remove and restore existing as indicated on Drawings, completely by cutting down and not by tumbling, throwing, or dropping.
7. Sheet Metal Flashings and Work: Remove back to a joint, lap, or connection. Secure loose or unfastened ends and make watertight.
8. Glass: Remove broken or damaged glass and clean the rebates of old setting materials.
9. Gypsum Wallboard: Cut back on straight lines to undamaged surfaces, with at least two opposite cut edges centered on supports.
10. Acoustical Ceilings: Dismantle ceilings and remove hanger wires.
11. Tile: Remove back to sound tile and backing on joint lines where portions are to remain.
12. Flooring: Completely remove flooring and clean the backing of old cement or adhesive.
13. Miscellaneous Items: Remove items not mentioned but required to be removed in such manner as will minimize damage to Work to remain.

D. Patching, Repairing, and Finishing:

1. Concrete: Keep cut edges damp for 24 hours and scrub with a neat portland cement mortar just before new concrete is placed; epoxy adhesive may be used in lieu of cement mortar. Finish new concrete to match existing. Use 3,000 psi concrete for repairs and slabs on grade. At cut concrete edges to remain exposed, apply adhesive and restore with minimum 3/4" thick cement mortar finished to match adjoining surfaces.
2. Openings To Be Closed: Trim edges square and straight, and dampen and grout scrub or treat with adhesive as specified above for cut concrete edges. Install 3,000 psi concrete. Provide reinforcing as required to match existing concrete. Where installation of concrete is impracticable, fill openings with dry-packed non-shrink grout. Finish to match adjoining surfaces.
3. Landscaping: The Contractor shall repair or replace sprinkler and irrigation items and plants that are affected by the remodel. Contractor shall coordinate with the Architect as to what Work is required to be done.
4. Masonry: Repair with matching masonry materials, reinforcement, jointing, and tooling.
5. Metal Items: Grind cut edges to remain exposed smooth and rounded.
6. Lath and Plaster:
 - a. Lath: Lath areas to be patched with matching lath as required. Lap new lath 6" over existing and wire-tie new and existing lath edges at 6" intervals. Restore paper backings as required, shingled into existing.

- b. Plaster: Apply bonding agent on cut edges of existing plaster. Apply 3-coat plaster patching of type, thickness, finish, color, and texture to match existing plaster.
7. Roofing: Cut back to sound undamaged materials and re-secure all cut edges. Apply new roofing materials in repair areas of same type and finish as existing, connected to existing roofing with waterproof connections.
8. Woodwork: Prepare wood to be refinished according to Section 09900 Painting. Patch with new matching or undamaged removed materials. The restored items shall be in a like new condition per Architects approval.
9. Sheet Metal: Restore removed or damaged sheet metal items as required or directed by Architect. Roof flashing materials shall be products of or be approved by roofing manufacturer.
10. Waterproofing Membranes: Trim back to sound undamaged membrane, seal cut edges, and apply new waterproofing lapped 36" minimum over existing membranes using matching materials and methods.
11. Glass: Install new matching glass.
12. Gypsum Wallboard: Refasten cut edges of existing board. Apply patches with at least two opposite edges centered on supports and secure at 6" centers. Tape and finish joints and fastener heads. Make patching non-apparent when painted.
13. Acoustical Ceilings: Conform to requirements indicated, specified herein, to applicable requirements of Section 09510, and as necessary to match existing conditions.
14. Flooring: Completely remove flooring and clean off old cement as specified. Install new flooring of color, pattern, and type to match existing floors. If an approved match cannot be made between existing and new flooring, remove all flooring in involved room or space and install new flooring at no extra cost to Owner. Clean and wax all new and existing resilient tile flooring in alteration areas and patched areas, and adjoining areas as directed. Use brand of wax in regular use by Owner.
15. Painted Surfaces: Prepare patched areas and refinish as specified in Section 09900.
16. Security System: The Contractor shall coordinate with the security personnel and Architect as to what additional equipment is required to expand the system to its new requirements and have them installed and tested to be compatible with existing system.
17. Miscellaneous Items: Patch and repair as required and approved.

3.02 PREPARATION OF EXISTING WORK:

- A. **Holes:** Drill holes through existing concrete or masonry for new conduit and/or piping, and do not jack-hammer.
- B. **Sandblasting:** Work includes sandblasting of existing surfaces to receive new materials secured by cementitious, adhesive, or chemical bond (such as concrete, toppings, elastomeric coatings, plaster, mortar, etc.), and the sandblasting of other

surfaces as shown, specified, directed, or required for proper preparation of surfaces. Completely remove existing finish, stains, oil, grease, bitumen, penetrated mastics and adhesives including primers, and all other substances deleterious to the bond or connection of new materials, and expose clean sound surfaces. Use wet sandblasting for interior surfaces, and for exterior surfaces where directed or necessary to prevent creation of a dust nuisance.

C. Metal Framework Painting: If necessary, wire brush clean and paint scarred areas, welds and rust spots on the visible surfaces. Touch up galvanized surfaces with galvanized repair paint applied in accordance with the manufacturer's instructions. In areas where touch-up painted surfaces are to be exposed, apply the paint to blend into the adjacent surfaces in a manner that will minimize visual discontinuity in the coatings.

3.03 SALVAGE: Existing items not to be reused or reinstalled that Owner intends to retain will be designated by Owner prior to start of removals in the pertaining area. Carefully remove, salvage, box or bundle as approved, and deliver such items to storage at site as Owner directs.

3.04 DISPOSAL: Conform to Section 01700. Dispose of removed material off the site except items to be salvaged or reinstalled. Promptly remove waste and debris and do not accumulate within facilities or on site.

END OF SECTION

SECTION 02513

ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide for the patch and/or repair of asphaltic concrete paving complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Subgrade preparation.
2. Soil sterilization.
3. Aggregate base course.
4. Prime coat.
5. Asphaltic concrete paving.
6. Fog seal coat.

B. Related Work Not In This Section:

1. Site preparation and earthwork, including rough grading.
2. Portland cement concrete curbs, drives, and paving.
3. Pavement striping, bumpers and signage.

1.02 QUALITY ASSURANCE:

A. Reference Specifications: Conform to following reference specifications to the extent specified. The term "Engineer" in the reference specifications shall be understood to mean "Architect". Requirements of measurement or payment in the reference specifications are hereby deleted; include Work of this Section under the Contract Sum for entire Work.

1. SSPWC Spec. The "Standard Specifications for Public Works Construction", Current Edition.
2. State Standard Spec. Standard Specifications of the California Business and Transportation Agency, Dept. of Public Works, Div. of Highways, Current Edition.

B. Proportioning of Plant Mix: Determine exact quantities of bituminous binder and mineral aggregate required to produce a mix equal to mix quality specified.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Product Data: Submit the manufacturer's technical Product Data and application directions for soil sterilizer.

B. Certificates and Statement: Submit certificates from asphalt concrete products suppliers that quality, gradation, proportions, and mixing of materials supplied under this Section meet the requirements specified. Materials not conforming to specified requirements are defective. Reject defective materials whether or not in place. Submit a statement supported by weight tickets showing the following information:

1. Calculations showing minimum amount of asphaltic concrete materials required for total area to be paved.
2. Amounts actually installed.

1.04 **JOB CONDITIONS:** Provide protection and repair adjacent surfaces and areas which may be stained or damaged as a result of installation. Protect installed paving Work until final acceptance. Repair or replace damaged or defective paving to original specified condition.

1.05 **WARRANTY:** Refer to Section 01740. Furnish to Owner a written warranty for one year, except warrant against weed or plant growth through paving for two years. Condition warranty to cover any portion of asphaltic concrete in which creeping, shoving, cracking, raveling, or softening occurs or in which weed growth occurs, and all depressed areas which collect water due to improper grading, placing, or defective materials during the warranty period. Repairs include the restoration of adjoining or applied materials and finish items.

PART 2 - PRODUCTS

2.01 **MATERIALS:**

- A. Soil Sterilizer:** Standard product non-selective borate-chlorate type sterilizer having minimum 46% boron-trioxide equivalent, as approved.
- B. Aggregate Base Course:** State Standard Spec Section 26, Class 2, 3/4" gradation maximum.
- C. Prime Coat:** SSPWC Spec Subsection 302-5.2, Grade SC-250 or SC-70, as approved.
- D. Asphaltic Concrete Surface Course:** SSPWC Spec Subsection 203-6, Type I-C2-PG 70-10.
- E. Fog Seal Coat:** Asphalt emulsion SS-1, State Standard Spec Section 37.

PART 3 - EXECUTION

3.01 CONSTRUCTION:

- A. **Subgrade Preparation:** Conform to SSPWC Spec Subsection 301-1, top 6" compacted to minimum 90% relative compaction at any location. Maintain the subgrade 2% above the optimum moisture content until covered with subsequent materials.
- B. **Soil Sterilizing:** Apply sterilizer according to manufacturer's directions using the dry or aqueous spray process, minimum quantity of dry undiluted material per 100 square feet of paving conforming to manufacturer's directions for control of medium and heavier weed growth and to meet warranty requirements. If necessary, apply supplemental watering to fully dissolve all sterilizer and obtain 2" to 3" penetration into the subgrade. Reroll treated subgrade to specified compaction. Do not apply sterilizer during rain or windy weather and prevent contamination of landscaping areas.
- C. **Aggregate Base Course:** Conform to SSPWC Spec Subsection 301-2. Place base course in one or two layers as required to produce 95% relative compaction. Deliver to site as a uniform mixture. Construct to indicated compacted thickness.
- D. **Prime Coat:** Conform to SSPWC Spec Subsection 302-5.2, quantity per square yard as approved. Apply on all completed aggregate base course.
- E. **Asphaltic Concrete:** Conform to SSPWC Spec Subsection 302-5 including requirements for smoothness and density. Apply asphaltic cement or emulsion paint binder on abutting concrete. Construct to minimum compacted thickness indicated.
- F. **Drainage Test:** Flood paving with water when rolling is completed and asphaltic paving is cool. Remove paving in improperly draining areas and install properly draining paving as directed, at no extra cost to Owner. Correction of low areas by skin patching is not acceptable.
- G. **Fog Seal Coat:** Conform to State Standard Spec Section 37. Spray apply at rate of 0.05 to 0.10 gallons per square yard, the exact quantity as required to fully seal the paving surface, as approved. Cover and protect adjoining surfaces from staining.

END OF SECTION

SECTION 02579

PAVEMENT MARKING, TRUNCATED DOMES AND SIGNAGE

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide pavement marking, truncated domes and signage as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Pavement markings.
2. Truncated domes.
3. Accessible signage.
4. Wheel bumpers, reinstall the existing in new locations.

PART 2 - PRODUCTS

2.01 TRAFFIC PAINT: Type specially manufactured for pavement traffic line markings by Dunn Edwards, Wellborn, Sherwin-Williams, Devoe, Sinclair, Pittsburg Paint, Behr, or equal, white color unless otherwise directed.

2.02 TRUNCATED DOMES: Provide truncated domes by Hanover Architectural Products (717) 637-0500 or Disability Devices, Inc., (714) 437-9237 or equal installed where indicated on drawings. The domes are to be ADA compliant and installed in accordance with manufacturers recommendations and specifications.

PART 3 - EXECUTION

3.01 PAVEMENT MARKING AND STRIPING: Paint traffic and parking lines as indicated. Machine-apply paint in accordance with the directions of the paint manufacturer. Unless otherwise shown, paint lines 4" wide and as required to achieve complete opacity. Paint directional arrows, numbering, and lettering in similar fashion and with same paint. Produce completed painting and striping free of holidays and whiskers. Be responsible for paint droppings and overspray. Completely remove droppings and repair injured surfaces in a satisfactory manner. Paint disabled lines and markings a minimum of 3" wide with blue color equal to Color No. 15090 per Federal Specification 595B, disabled parking symbols, stall striping, debarkation aisles and path of travel lanes to the extent required by the Code and as enforced by the local jurisdiction where indicated. Parking spaces for the disabled shall be marked according to CBC Section 1129B.5. The tactile warning lines shall be in conformance to CBC Section 1133B.8.3 and 1133B.8.4.

3.02 ACCESSIBLE SIGNAGE: Set in accordance with Districts Standards and as detailed on drawings, provide reflectorized International Symbol of Accessibility signs and required text with porcelain enamel finish, and steel frame. Mount and finish required by Building Code. Locate signage and designed disabled stalls where indicated on site. Post mounted and wall mounted signs shall be fabricated from 16 gage enameling iron with

porcelain enamel finish. Mount signs to posts with minimum two 3/16" diameter round head bolts with tamperproof nuts, galvanized. Posts are 2" diameter galvanized steel pipe weighing a minimum of 3.65 lbs per foot and conforming to ASTM A53, Schedule 40 or 2" x 2" galvanized steel tubing, weighing a minimum of 4.31 lbs per foot and conforming to ASTM A500, Grade B, 3/16" thick wall thickness.

END OF SECTION

SECTION 02579

PAVEMENT MARKING, TRUNCATED DOMES AND SIGNAGE

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide pavement marking, truncated domes and signage as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Pavement markings.
2. Truncated domes.
3. Accessible signage.
4. Wheel bumpers, reinstall the existing in new locations.

PART 2 - PRODUCTS

2.01 TRAFFIC PAINT: Type specially manufactured for pavement traffic line markings by Dunn Edwards, Wellborn, Sherwin-Williams, Devoe, Sinclair, Pittsburg Paint, Behr, or equal, white color unless otherwise directed.

2.02 TRUNCATED DOMES: Provide truncated domes by Hanover Architectural Products (717) 637-0500 or Disability Devices, Inc., (714) 437-9237 or equal installed where indicated on drawings. The domes are to be ADA compliant and installed in accordance with manufacturers recommendations and specifications.

PART 3 - EXECUTION

3.01 PAVEMENT MARKING AND STRIPING: Paint traffic and parking lines as indicated. Machine-apply paint in accordance with the directions of the paint manufacturer. Unless otherwise shown, paint lines 4" wide and as required to achieve complete opacity. Paint directional arrows, numbering, and lettering in similar fashion and with same paint. Produce completed painting and striping free of holidays and whiskers. Be responsible for paint droppings and overspray. Completely remove droppings and repair injured surfaces in a satisfactory manner. Paint disabled lines and markings a minimum of 3" wide with blue color equal to Color No. 15090 per Federal Specification 595B, disabled parking symbols, stall striping, debarkation aisles and path of travel lanes to the extent required by the Code and as enforced by the local jurisdiction where indicated. Parking spaces for the disabled shall be marked according to CBC Section 1129B.5. The tactile warning lines shall be in conformance to CBC Section 1133B.8.3 and 1133B.8.4.

3.02 ACCESSIBLE SIGNAGE: Set in accordance with Districts Standards and as detailed on drawings, provide reflectorized International Symbol of Accessibility signs and required text with porcelain enamel finish, and steel frame. Mount and finish required by Building Code. Locate signage and designed disabled stalls where indicated on site. Post mounted and wall mounted signs shall be fabricated from 16 gage enameling iron with

porcelain enamel finish. Mount signs to posts with minimum two 3/16" diameter round head bolts with tamperproof nuts, galvanized. Posts are 2" diameter galvanized steel pipe weighing a minimum of 3.65 lbs per foot and conforming to ASTM A53, Schedule 40 or 2" x 2" galvanized steel tubing, weighing a minimum of 4.31 lbs per foot and conforming to ASTM A500, Grade B, 3/16" thick wall thickness.

END OF SECTION

SECTION 03100

FORMS

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide forms for all Work constructed of cast-in-place concrete as indicated, specified, and required.

A. Related Work Not In This Section:

1. Furnishing and placing reinforcing for cast-in-place concrete.
2. Furnishing, placing, finishing, and curing of cast-in-place concrete.
3. Placing of embedded anchor bolts and inserts.
4. Screeds for slabs.

1.02 QUALITY ASSURANCE: Construct forms conforming to the tolerances specified in ACI 301, "Specifications for Structural Concrete for Buildings", as applicable, unless exceeded by requirements of regulatory agencies or otherwise indicated or specified.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Shop Drawings: Submit Shop Drawings showing form pattern layouts of all exposed exterior and interior concrete dimensioned to precisely locate grooves, form panel jointing, and similar features. Review and approval will not include form strength and adequacy.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING: Deliver materials in timely manner to ensure uninterrupted progress. Store materials by methods that prevent damage and permit ready access for inspection and identification.

PART 2 - PRODUCTS

2.01 MATERIALS: Furnish materials conforming to the following requirements:

Form lumber:	WCLIB "Construction" grade or better, WWPA No. 1 or better, or equal.
Form plywood:	PS 1-Current Edition, Group I, Exterior B-B Plyform or better, minimum 5-ply and 5/8" thickness, grade marked, not mill oiled. Plywood having medium or high density overlay is acceptable.
Form ties:	Prefabricated rod, flat band, wire, or internally threaded disconnecting type, not leaving metal within -1/2" of concrete surface.
Form coating:	Resin type coating free of oil, silicone, wax, and non-drying material, not grain-raising.

PART 3 - EXECUTION

- 3.01 **FORM ERECTION AND REMOVAL:** Conform to ACI 301 and ACI 347 "Recommended Practice for Concrete Formwork" except as exceeded by requirements of Code, regulatory agencies, or herein.
- A. Construction:** Coat forms with the specified resin coating, not form oil. Construct forms to exact shapes, sizes, lines, and dimensions required to obtain level and plumb and straight surfaces. Provide openings, offsets, keys, anchorages, recesses, reglets, moldings, chamfers, blocking, screeds, drips, bulkheads, and all other required features. Make forms removable without hammering or prying against concrete. Space forms apart with metal spreaders. Construct forms to accurate alignment, location and grades, and provide against sagging, leakage of concrete mortar, or displacement occurring during and after placing of concrete. Coordinate installation of inserts in forms according to Shop Drawings and instructions of other trades.
 - B. Corners and Angles:** Provide 3/4" by 3/4" beveled chamfer strips for concealed concrete corners and angles unless otherwise indicated. Form exposed concrete corners and angles square unless otherwise indicated.
 - C. Reglets and Rebates:** Form all required reglets and rebates to receive flashing, frames, and other equipment. Obtain dimensions, details, and precise positions from related trades and form concrete accordingly.
 - D. Form Joints:** Fill joints to produce smooth surfaces, intersections and arrises. Use polymer foam or equivalent fillers at joints and where forms abut or overlap existing concrete to prevent leakage of mortar.
 - E. Recesses, Drips, and Profiles:** Provide smooth milled wood or preformed rubber or plastic shapes of types shown and required.
 - F. Cleanouts and Cleaning:** Provide temporary openings in wall forms for cleaning and inspection. Clean forms and surfaces to receive concrete prior to placing.
 - G. Re-Use:** Clean and recondition form material before re-use.
 - I. Time of Form Removal:** Do not remove forms until the concrete attains sufficient strength to support its own weight and all superimposed loads.
- 3.02 **MISCELLANEOUS CONCRETE WORK:** Provide forms for concrete areaways, cast-in-place valve boxes, pits, bases, and other miscellaneous concrete as shown and required to complete all Work. Conform to applicable requirements herein.

3.03 FIELD QUALITY CONTROL: Refer to Section 01400.

- A. **Supervision:** Perform Work of this Section under the supervision of a capable concrete form superintendent.
- B. **Continuous Inspection:** Obtain inspection and approval of forms before placing structural concrete.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide reinforcing steel complete as indicated, specified and required.

A. Work In This Section: Principal items include:

1. Reinforcing bars and mesh for cast-in-place concrete.
2. Furnish and deliver to site steel bar reinforcing for masonry.

B. Related Work Not In This Section:

1. Reinforcement for epoxy concrete.
2. Installation of reinforcing bars in masonry.

1.02 QUALITY ASSURANCE:

A. Source Quality Control: Refer to Section 01400 for general testing requirements and to following paragraphs for specific procedures. Testing Laboratory shall perform following conformance testing shall select the test samples of bars, ties, and stirrups from material at the site or from place of distribution, each sampling including at least two 18" long pieces, and perform the following tests according to ASTM A615.

B. Identified Bars: If samples are obtained from bundles as delivered from the mill, identified as to the heat number, accompanied by the mill analyses and mill test reports, and properly tagged with Identification Certificate so as to be readily identified, perform one tensile and one bend test for each 25 tons or fraction thereof of each size of bars. Submit mill reports when samples are selected.

C. Unidentified Bars: When positive identification of bars cannot be made and when random samples are obtained, perform tests for each 10 tons or fraction thereof, one tensile and one bend test from each size of reinforcement.

D. Codes: C.B.C. and/or U.B.C. Building Codes and latest Supplements thereto and "Standard Specifications for Public Works Construction" Current Edition.

E. Standards: (As Applicable)

1. ACI-301 - Specifications for Structural Concrete for Buildings.
2. ACI-315 - Details and Detailing of Concrete Reinforcement.

3. ACI-318 - Building Code Requirements for Reinforced Concrete.
4. ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.
5. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
6. ASTM A497 - Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
7. ASTM A615 - Deformed and plain Billet-Steel Bars for Concrete Reinforcement.
8. ASTM A706 - Low-Alloy Steel deformed bars for Concrete Reinforcement.
9. AWS.D1.4 - Structural Welding Code For Reinforcing Steel.
10. CRSI - Concrete Reinforcing Steel Institute Manual of Practice.
11. CRSI-63 - Recommended Practice for Placing Reinforcing Bars.
12. CRSI-65 - Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

1.04 SUBMITTALS: Refer to Section 01300 for submittal procedures and requirements.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING: Deliver materials in timely manner to ensure uninterrupted progress. Store materials by methods that prevent damage and permit ready access for inspection and identification.

PART 2 - PRODUCTS

2.01 MATERIALS: Furnish materials meeting the test requirements of Paragraph "Source Quality Control" hereinbefore, as applicable, and following requirements:

Reinforcing bars:	ASTM A615, Grade(s) 40 and 60, per structural drawings; in addition, the ultimate tensile stress shall be not less than 1.25 times the actual yield stress (based on mill tests) and the carbon equivalent value shall not exceed 0.065. All welded rebar to be A706.
Reinforcing mesh:	ASTM A185, mesh size and gage as indicated on drawings, 60 ksi minimum tensile strength.
Tie wire:	Annealed steel, 16 gage minimum.
Welding electrodes:	AWS D5.1, 80 of 90 Series, low hydrogen Type AWS D1.4.
Anchors/Dowels for: For Expansion Joints:	#4 rebar, with "Speed Dowel" as manufactured by Aztec Concrete Accessories, Inc., (800) 531-3355 or (909) 829-2765.
Chairs, Spacers and Supports:	Conform to ACI-315, fabricated from steel wire with coated exposed legs or equivalent plastic products or dense precast concrete blocks for slab on grade only.

2.02 FABRICATION OF REINFORCING BARS:

- A. Bending and Forming:** Fabricate bars of the indicated sizes and bend and form to required shapes and lengths by methods not injurious to materials. Do not heat reinforcement for bending. Bars with unscheduled kinks or bends are subject to rejection. Use only tested and approved bar materials.
- B. Welding:** All reinforcing steel subject to welding shall conform to ASTM 706, Grade 60. Perform welding, where shown or approved, by the direct electric arc process in accordance with AWS D1.4 using the specified low-hydrogen electrodes. Preheat 6" each side of joint. Protect joints from drafts during the cooling process; accelerated cooling is prohibited. Do not tack weld bars. Clean metal surfaces to be welded of all loose scale and foreign material. Clean welds each time electrode is changed and chip burned edges before placing welds. When wire brushed, the completed welds must exhibit uniform section, smooth welded metal, feather edges without undercuts or overlays, freedom from porosity and clinkers, and good fusion and penetration into the base metal. Cut out welds or parts of welds found defective with chisel and replace with proper welding. Employ only experienced certified welding operators. Prequalification of welds shall be in accordance with Code. Reinforcing bars to be welded shall conform to ASTM A706, Grade 60.
- C. Marking and Shipping:** Bundle bars, tag with identification, and transport and store so as not to damage any material. Keep a sufficient supply of tested and approved bars at site to avoid delays.

PART 3 - EXECUTION

3.01 INSTALLATION OF REINFORCING: Provide additional bars at sleeves and openings as required. Before placing bars, and again before concrete is placed, clean bars of loose mill scale, oil, or other coating that might destroy or reduce bond.

- A. Securing in Place:** Accurately place bars and wire tie in precise position where bars cross. Bend ends of wire ties away from forms. Wire tie bars to corners of ties and stirrups. Support bars according to current edition of "Recommended Practice for Placing Bar Supports" of the Concrete Reinforcing Steel Institute, using approved accessories and chairs. Use precast concrete cubes with embedded wire ties to support reinforcing steel bars in concrete placed on grade and in footings.
- B. Exposed Surfaces:** Provide stainless steel or plastic tipped chairs, bolsters, and accessories where exposed on exterior or interior concrete surfaces not to be painted or covered.
- C. Clearances:** Maintain minimum clear distances between reinforcing bars and face of concrete as indicated or directed.

- D. Splices:** Do not splice bars at points of maximum stress except where indicated. Lap splices as shown or required to develop the full strength or stress of bars. Stagger splices for bars in slabs at least 48" longitudinally so that no more than 1/3 of bars are spliced in one location. Splices to be in contact or spaced one bar diameter or 1" clear and in columns 1-1/2 bar diameter or 1-1/2 clear
 - E. Field Welding of Bars:** As specified for fabrication.
 - F. Maintaining Bars In Position:** Assign a competent ironworker mechanic at every concrete placing location to inspect reinforcement and maintain all bars in the correct positions, unless permitted by Engineer, reinforcement shall not be bent after being placed in hardened concrete.
 - G. Reinforcing Mesh:** Lap two full mesh plus 2" at splices, wire tie, and support the same as specified for bars.
- 3.02 MISCELLANEOUS CONCRETE WORK: Provide reinforcing for areaways, cast-in-place valve boxes, pits, splash blocks, bases, and other miscellaneous concrete as shown and required to complete all Work. Conform to applicable requirements herein.
- 3.03 FIELD QUALITY CONTROL: Refer to Section 01400.
- A. Supervision:** Perform Work of this Section under the supervision of a capable superintendent.
 - B. Inspection:** Obtain inspection and approval of reinforcing before concrete is placed.
 - C. Welding Inspection:** Whether welding is done in the shop or at the site, perform welding of reinforcing bars under continuous inspection of the Testing Laboratory Welding Inspector.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide all Work constructed of cast-in-place concrete complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Furnishing, placing, patching, and initial curing of cast-in-place concrete unless otherwise specified.
2. Grout work, except as otherwise specified.
3. Placing of embedded anchor bolts and inserts.
4. Vapor barrier under interior floor slabs on grade.

B. Related Work Not In This Section:

1. Preparation and grading of earth subgrade under concrete.
2. Furnishing, erection, and removal of forms.
3. Furnishing and placing reinforcing for cast-in-place concrete.
4. Final finishing and curing of cast-in-place concrete.
5. Crushed rock/sand fill under interior floor slabs.

1.02 QUALITY ASSURANCE:

A. Concrete Manufacturer: Furnish all concrete from licensed commercial ready-mix concrete plants conforming to ASTM C94 and approved by Building Official. The requirements herein govern when exceeding ASTM C94.

B. Allowable Tolerances: Construct concrete conforming to tolerances specified in ACI 301, "Specifications for Structural Concrete for Buildings", as applicable, unless exceeded by requirements of regulatory agencies or otherwise indicated or specified.

C. Source Quality Control: Refer to Section 01400 for general testing requirements and to following paragraphs for specific procedures. Concrete materials which, by previous tests or actual service, have shown conformance may be used without testing when approved by Architect and Building Official. Testing Laboratory shall perform following conformance testing.

1. Portland Cement: Furnish Mill Certificates, acceptable to the Architect and Building Official, showing conformance with requirements specified; otherwise, the Testing Laboratory shall test each 25 barrels of cement in accordance with ASTM C150.

2. Aggregate For Normal Weight Concrete: Test the aggregate before and after concrete mix is designed and whenever character of aggregate varies or source of material is changed. Include a sieve analysis. Obtain samples of aggregates at source of supply or at the ready-mix concrete plant in accordance with ASTM D75 and perform tests for the following properties:

Sieve analysis:	ASTM C136.
Organic impurities:	ASTM C40, fine aggregate color not darker than the reference standard color.
Soundness:	ASTM C88, loss after 5 cycles not over 8% of coarse aggregate or 10% of fine aggregate.
Abrasion:	ASTM C131, weight loss not more than 10-1/2% after 100 revolutions, 42% after 500 revolutions.
Deleterious materials: Materials finer than No. 200 sieve:	ASTM C33. ASTM C117, not over 1% for gravel, 1.5% for crushed aggregate, per ASTM C33.
Reactivity potential:	ASTM C227, C289, and C342, ratio of silica released to reduction in alkalinity not to exceed 1.0; include full report for Architect's evaluation.
Sand equivalent:	ASTM D2419, California Sand Equivalent values not below 80 percent.
FlyAsh:	ASTM C618, Class F.

1.03 CONCRETE MIX DESIGNS: Testing Laboratory shall design concrete mixes for all concrete requiring 28-day compressive strength exceeding 2,000 psi. Contractor shall bear all costs for concrete mix designs. Mix design shall be stamped and signed by a licensed California Professional Engineer and shall identify where concrete mix is to be used.

- A. **Strength Requirements:** Design mixes for structural concrete for minimum 28-day compressive strengths required by Drawings and Specifications. The trial batch strength for each mix shall exceed indicated or specified strength by 750 psi or a lesser amount based on standard deviations of strength test records according to ACI 318.
- B. **Basis of Mix Designs:** Design concrete mixes for workability and durability of concrete. Control mixes in accordance with Chapter 4, ACI 318 "Building Code Requirements for Reinforced Concrete". Make adjustments in cement content as necessary for required concrete strengths at the Contractor's expense. Do not exceed 0.45 absolute water-cement or cement plus fly ash ratio by weight. The admix for formed normal weight concrete shall contain an air-entraining agent producing air content of 3.5% to 6.5% by volume and adjusted for weather conditions. Air entrainment is not required for footing and foundation concrete. Do not use calcium chloride. Other admixtures containing material releasing nitrates in solution are limited to 0.06% by weight for the chloride ion.

- C. **Maximum Aggregate Sizes:** Not exceeding 3/4 of minimum clear space between bars and between bars and forms, no larger than 1/5 of least dimensions between the forms. Design the mixes with 1" maximum size, except maximum 1-1/2" size for foundations and maximum 3/8" size where congested reinforcing or thin sections occur. Obtain specific approval of Structural Engineer prior to use of 3/8" (pea gravel) mix.

1.04 SUBMITTALS: Refer to Section 01300 for procedures.

- A. **Shop Drawings:** Submit for structural concrete and concrete slabs showing dimensioned locations and types of construction and expansion joints.
- B. **Samples:** Refer to Section 03345.
- C. **Concrete Mix Design:** Refer to this Section.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING: Deliver materials in timely manner to ensure uninterrupted progress. Store materials by methods that prevent damage and permit ready access for inspection and identification.

1.06 JOB CONDITIONS: Do not place concrete during rain or adverse weather conditions without means to prevent any damage. Conform to ACI 305 "Recommended Practice for Hot Weather Concreting" and ACI 306 "Recommended practice for Cold Weather Concreting" as required except do not use calcium chloride or accelerators.

- A. **Coordination:** Coordinate with related trades and verify concrete surfaces are correctly finished, water or sheet cured without the use of curing compound and are dry.
- B. **Below Slab Conditions:** Place concrete slabs over the sand layer membrane without driving stakes or anything else through it. Control of concrete shrinkage cracking and curling must be accomplished by established good-concreting practices, such as by curing methods, joint spacing and mix design. Require use of concrete block supports beneath rebar. A low water/cement ratio permitted by water reducing admixtures or by maintaining a slump as specified on the drawings is required to facilitate finishing in a timely manner. Require that concrete contractor exercise care to avoid damaging installed membrane system in any way and that if damage occurs he immediately notifies membrane installer for repair.

PART 2 - PRODUCTS

2.01 MATERIALS: Furnish materials meeting the test requirements of Paragraph "Source Quality Control" hereinbefore, as applicable, and following requirements:

Portland cement: ASTM C150, Type II or Type V, low alkali. Do not change brand without prior approval.

Stone aggregates:	ASTM C33, from approved pits, free from vegetable matter and of opaline, feldspar, and siliceous magnesium substances; clean, hard, fine-grained sound crushed rock or washed gravel; not over 5% by weight of flat, thin, elongated, friable or laminated pieces (pieces having the major dimension over 5 times average dimension) or over 2% by weight of shale or cherty material.
Admixture:	ASTM C494, All material shall be non-corrosive and have chloride content not exceeding water: Type A - Water-reducing. Type C - Water-reducing, accelerator. Type D - Water-reducing, retarded. Type F or G - High range water reducing, optional subject to approval of Structural Engineer.
Pozzolan:	ASTM C618, Class F Fly Ash, not exceeding 15% of total cementitious material by weight.
Air-entraining admix:	ASTM C260.
Water:	From potable domestic source.
Joint filler:	ASTM D1751 and D1752, as specified.
Curing compound:	ASTM C309, fugitive dye dissipating type.
Curing sheet:	ASTM C171, non-staining white types.
Evaporation retardant and finishing aid:	Master Builders "Confilm", or equal.
Surface retarder:	L.M. Scofield "Lithotex Retarder", Sika Type S or B "Rugasol", Chem-Masters "Exposee H", or equal.
Vapor barrier:	Preformed sheet membrane per STM E1745, Class A. Water Vapor Transmission Rate, 0.006 WVTR, or lower, 10-mil thickness, with minimum 2" wide waterproof plastic tape, self-adhering type.
Non-shrink grout:	Master Builders "Embeco" 636 885, or equal, non-gas-forming type, free of oxidizing catalysts and inorganic accelerators, performance characteristics when mixed to fluid consistency meeting CRD-611 and CRD-631, non-staining type in exposed areas.
Bond Breaker:	Hunts Process Tilt-Cure or 225-TU or Master Builders or equal materials as required for each type of application. Refer to Section 03430 Tilt-Up Concrete for additional recommendations.
Bonding and Repair:	1. Bonding material shall be a polyvinyl acetate compound for use in areas not subject to moisture. 2. Epoxy adhesive shall be a two-part compound suitable for wet or dry areas. 3. Patching mortar shall be free flowing, polymer-modified cementitious coating. 4. Bonding admixture shall be a latex, non-wettable type.

- 2.02 **CONCRETE MIXING:** Furnish ready-mixed concrete from an approved commercial offsite plant. Conform to ASTM C94, except materials, testing, and mix designs as specified herein. Use transit mixer trucks equipped with automatic devices for recording number of revolutions of drum.
- A. **Limitation of Mix Water:** Do not deliver ready-mixed concrete to site with total amount of mixing water included. Withhold 2-1/2 gallons of water per cubic yard at the plant unless a lesser amount is approved by the Structural Engineer, then add to mix before concrete is discharged from the mixer truck under supervision of Inspector. Each mixer truck shall arrive at the site with full water tank; if the tank is not full and concrete tests to a slump greater than specified, entire load is subject to rejection.
 - B. **Slump:** Adjust quantity of water so concrete at time of placing does not exceed the slumps of 4", unless otherwise required by the Architect, and at the point of placing when tested according to ASTM C143. Use the minimum water necessary for workability required by part of structure being cast. The maximum slumps shall not be exceeded.

PART 3 - EXECUTION

- 3.01 **PREPARATION FOR CONCRETE PLACING:** Remove free water from forms before concrete is deposited. Remove hardened concrete, debris, and all foreign materials from forms and from surfaces of mixing and conveying equipment.
- A. **Wetting:** Wet wood forms sufficiently to tighten up cracks. Wet other materials sufficiently to reduce suction and maintain concrete workability.
 - B. **Earth Subgrade:** Lightly dampen subgrade 2 hours before placing concrete but do not muddy. Re-roll where necessary for smoothness and remove loose material.
 - C. **Crushed Rock Fill:** Recompact disturbed crushed rock and bring to correct elevation.
 - D. **Subslab Drainage Fill:** Recompact disturbed material and bring to the correct elevation.
- 3.02 **CONCRETE PLACING:**
- A. **Joints In Concrete:** Locate joints only where approved. Obtain prior approval for points of stoppage of any pour. Clean and roughen surface of construction joints by removing entire surface and exposing 1/4" of clean aggregate solidly embedded in mortar matrix by sandblasting, chipping, or equal. Water and keep hardened concrete wet for not less than 24 hours before placing new concrete. Cover horizontal surfaces of existing or previously placed and hardened concrete with fresh concrete less 50% of coarse aggregate just before balance of concrete is

placed. Carefully control amount of moisture applied so that no free water will be present at any time.

- B. Conveying and Placing:** Do not place concrete until reinforcing steel, forms, or metal decking have been approved by the Inspector and other authorities having jurisdiction. Do not use aluminum tubes or any aluminum equipment for pumping concrete, nor allow concrete to free fall from its point of release at mixer, hoppers, tremies, or conveying equipment more than 3 feet. Deposit concrete so that the surface is kept level throughout, a minimum being permitted to flow from one portion to another. Place concrete in horizontal layers not more than 18" thick within 45 minutes after water is first added to the batch. Place concrete by methods that prevent segregation of materials. For special exposed concrete do not use first batch of concrete at each start up.
- C. Consolidation:** Vibrate each layer of concrete as placed with mechanical vibrators or equivalent equipment to accomplish thorough consolidation. Supplement by hand rodding or spading adjacent to forms. Vibration through forms shall not be used. Compact concrete into corners and angles of forms and around reinforcement and embedded fixtures. Recompact deep sections with heavy congestion due to reinforcing steel.
- D. Operation of Vibrators:** Do not transport concrete in forms with vibrators nor allow vibrators to contact forms or reinforcing. Push vibrators vertically into preceding layers that are still plastic and slowly withdraw, producing maximum obtainable density in concrete without creating voids or segregation. Under no circumstances disturb concrete that has stiffened or partially set. Vibrate at intervals not exceeding two-thirds the effective visible vibration diameter of the submerged vibrator and generally at 18" on centers. Avoid excessive vibration and conform to ACI 309 "Recommended Practice for Consolidation of Concrete".
- E. Re-Vibration:** Place concrete containing retarding admixture by a schedule that allows layers of concrete to be in place and compacted for at least 30 minutes before the next layer of concrete is placed. Remove bleed water on the concrete surface and from forms and re-vibrate the concrete down as far as the concrete is plastic before placing the next layer.
- F. Correction of Segregation:** Before placing next layer of concrete, and at top of last placement for vertical elements, remove concrete containing excess water or fine aggregate or showing deficiency of coarse aggregate and fill the space with compacted concrete of correct proportions.
- G. Slabs:** Strike off excess concrete by screeding to bring top surface to proper grade. The screed template should be removed across the concrete in a sawing manner as it is brought forward. Use a darby or bull-float after the screed operation, to eliminate high and low spots. Compact and tamp concrete, and bring 1/8" to 3/16" of coarse mortar to surface. Wood float to straightedges and screeds after water sheen has disappeared. Do not use steel or plastic floats of any

kind for initial floating operations. Do not apply finishes until all surface water disappears and surface is sufficiently hardened. Remove bleed water and laitance as it appears. Section 03345 covers final slab finishing and curing.

- 3.03 **CURING OF CONCRETE:** Cure concrete for at least 10 days, under moist conditions. Forms which are maintained tight and wet are considered adequate curing. Fresh backfill is adequate curing for footings and subgrade walls. Cure exposed concrete surfaces by application of additional procedure.
- A. Horizontal Concrete and Slabwork:** Commence curing during finishing of surfaces immediately after "bleed water" disappears by use of fine mist-type fog spray and continue without interruption until application of long-term curing, which must be done after final troweling when concrete has attained final permanent set and bleeding has stopped. Long-term curing must be done as specified in Section 03345 Concrete Finishing.
 - B. Curing:** Conform to ACI 308. Use proposed methods in fabricating sample panel for Architects approval.
 - 1. Hot Weather Curing: Conform to ACI 305.
 - 2. Cold Weather Curing: Conform to ACI 306.
 - C. Cure concrete slabs to receive elastomeric** surfaces by water curing method; curing compounds or chemical agents shall not be used unless they will completely dissipate within 28 days and are approved for use by the coating manufacturer. Allow concrete to dry minimum of 28 days.
 - D. Cure, Seal and Harden** all exposed interior and exterior flatwork, including floor slabs, stairs, walks, pavements, parking and driving areas, etc.
- 3.04 **PATCHING FORMED CONCRETE:** Remove fins, projections, and offsets. Cut out rock pockets, honeycomb, and other defects to sound concrete, edges of cuts straight and back-beveled. Dampen cuts and scrub with neat portland cement slurry just prior to patching, or apply an approved epoxy concrete adhesive. Saturate form tie holes with water and fill all voids and patches with flush smooth-finished mortar of same mix as concrete (less coarse aggregate), cure, and dry.
- 3.05 **FINISHING EXPOSED FORMED CONCRETE:** Refer to Section 03345.
- 3.06 **SLAB FINISHING AND CURING:** Refer to Section 03345.
- 3.07 **GROUTING:** Install as indicated or required except for the items grouted by other trades.
- A. Mixing:** Mix the approved non-shrink grout material with sufficient water per manufacturer's recommendations, so it flows under its own weight for grout, and to just moisten and bind the material together for drypack.

- B. Placing and Curing:** Place fluid grout from one side only and puddle, chain, or pump for complete filling of voids; do not remove the dams or forms until grout attains initial set. Finish exposed surfaces smooth and cure with damp burlap at least 3 days.
- 3.08 MISCELLANEOUS CONCRETE WORK: Provide areaways, cast-in-place valve boxes, pits, splash blocks, bases, and other miscellaneous concrete as shown and required to complete all Work. Conform to applicable requirements herein.
- 3.09 FIELD QUALITY CONTROL: Refer to Section 01400.
- A. Supervision:** Perform Work of this Section under the supervision of a capable concrete superintendent.
- B. Level of Floors:** Continuously monitor concrete placing operations to maintain level floor by use of an instrument level, transit, or laser.
- C. Continuous Inspection:** All construction of concrete with a specified strength in excess of 2,500 psi shall be continuously inspected. Obtain inspection and approval of forms and reinforcing by Building Department as required and by the Inspector before placing structural concrete.
- D. Testing of Concrete:** Testing Laboratory shall perform following tests:
1. Compressive Strength Tests: Cast one set of four or more test cylinders from each day's concrete placing and each 150 cubic yards, or fraction thereof, or for each 5,000 square feet of slab, of each strength of structural concrete. Date test cylinders, number, and tag showing the location from which sample was taken. Indicate slump test result of each sample. Do not make more than two series of tests from any one location or batch of concrete.
 2. Test Cylinders: Cast according to ASTM C31; 24 hours later, store cylinders under moist curing conditions at about 70°F. Test according to ASTM C39; one cylinder at 7 and two cylinders 28 day ages. Retain one cylinder for testing at 56 days if 28 day test fails.
- F. Core Tests:** Should tests show the strength of any concrete falls below required minimum, additional testing of concrete which unsatisfactory tests represent may be required. Make core tests according to ASTM C42. Fill the core holes with grout concrete of strength required for concrete. Contractor shall bear cost of tests for below-strength concrete even if such tests indicate concrete has attained required minimum compressive strength.

END OF SECTION

SECTION 03345

CONCRETE FINISHING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Perform and provide all concrete finishing required to complete the Work, except for concrete finishing specified to be performed under other Sections.

A. Work In This Section: Principal items include:

1. Samples and submittals.
2. Finishing of exposed formed concrete.
3. Final slab finishing and curing.

B. Related Work Not In This Section:

1. Furnishing, erection, and removal of forms.
2. Furnishing, placing, patching, and initial curing of cast-in-place concrete unless otherwise specified.

1.02 QUALITY ASSURANCE: As specified in Section 03300.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Product Data: Submit for the following:

1. Curing-sealer-hardener.

B. Site Samples: Prepare following Samples at the site, cast in the directed locations and orientations. Prepare as many Samples of each type of concrete as are required for approval. Remove Samples from the site when no longer needed and removal is approved. Approved Samples may be part of permanent construction if meeting all other requirements shown and specified and are so approved. Use form and concrete materials previously approved under Sections 03100 and 03300.

1. Slab Samples: Prepare minimum 4-foot square Samples of each required slab finish excluding only monolithic trowel and steel float finishes. Include a transverse expansion joint, scoring, and edging.

PART 2 - PRODUCTS

2.01 MATERIALS: Furnish materials conforming to Section 03300, as applicable, and following requirements:

Curing-sealer-
hardener:

Ashford Formula by Curecrete Chemical Company,
Inc. distributed by BMSA inc. (949) 233-2127 or
UniSeal by Unitex (816) 231-7700 or approved equal,
applied and warranted as specified herein.

PART 3 - EXECUTION

3.01 FINISHING EXPOSED FORMED CONCRETE: Surface patching and initial curing of formed concrete are specified in Section 03300. Rub surfaces with a carborundum brick or equal until smooth and free of form marks, offsets, and other defects, and in uniform planes. Wet rubbed surface and then brush coat with cement grout consisting of 1 part light-colored portland cement to 2 parts fine aggregate and mixed with water to the consistency of thick paint. Cork or wood float grout to fill all pits, air bubbles, and surface holes. Scrape off excess grout and rub surface with burlap or equal to remove all grout film. After grout sets, again coat with same grout, cure, then brick and burlap rub as necessary to eliminate remaining defects and blemished, and damp cure surfaces for not less than 3 days or longer if required for complete curing of concrete. Finish, clean, and cure each surface as a continuous operation. Produce uniformly plane smooth surfaces free of grout film, grout or rubbing marks, defects, or blemishes after painting or covering with a flexible type finish material. Unless otherwise indicated or specified, apply this finish on exposed formed concrete.

A. Surfaces Excepted: Rubbed and grouted finish is not required on following surfaces:

1. Permanently concealed concrete.
2. Concrete exposed in electrical, utility, storage, shaft, and similar non-public rooms and areas.

3.02 SLAB FINISHES: Produce finish slab surfaces level or sloped with tolerances indicated on the Drawings and ACI Standards. Keep surface moist with a fine fog spray of water as necessary. Dusting with dry cement or sand during finishing operations is not permitted. Finish all slab edges and joints with an edging tool. Match the approved Sample panels. Apply the following finishes as indicated, specified, directed, and applicable.

A. Broom Finish: Prepare same as steel float finish, then apply a uniform approved coarse texture finish as approved by Architect, by sliding a wire or stiff bristle broom in one direction along a straightedge guide placed at right angles to the direction of traffic. At walking areas, apply smooth finish 3" wide at edges, expansion joints and scoring.

- B. Monolithic Trowel Finish:** For slab and flatwork surfaces not indicated or specified to receive another finish. After surface water disappears and floated surfaces are adequately hardened, steel trowel and retrowel concrete to a smooth surface. After concrete has set sufficiently to ring the steel trowel, retrowel to a smooth uniform finish free of trowel marks and blemishes. Avoid excessive retroweling that produces burnished areas.
 - C. Steel Float Finish:** Same as for monolithic trowel finish except omit the second retroweling.
 - D. Scoring:** Provide where shown or directed, using tool of approved size and profile. Run score lines straight and of uniform appearance. If scoring is not indicated, obtain Architect's instructions not less than two working days before the day slab concrete is placed.
- 3.03 SLAB CURING: Promptly apply curing media as soon as finishing is complete without marring surfaces, and in any case on same day. Apply liquid compound in accordance with the manufacturer's published application rates; apply 2 spray coats, with second coat at right angle to first coat. Cover adjoining surfaces. Equip spray nozzles with windshield suitable for wind conditions.
- A. Curing Period and Protection:** Maintain all curing media intact and sealed for 10 days minimum after application. Keep foot traffic on the curing surfaces to minimum possible and completely off liquid compound cured surfaces; vehicular traffic is not permitted on the surfaces until curing is completed. Immediately restore all damaged or defective curing media.
 - B. Restriction:** Do not apply liquid membrane-forming curing compounds on any concrete to receive or bond to concrete or mortar, or on any surfaces to receive subsequent material or finish unless such use and the specific compound used are approved by manufacturer of the material or finish to be applied, and verify all such use with related trades. Do not apply curing compounds on slabs to receive elastomeric or bituminous type coatings.
 - C. Liquid Membrane-Forming Curing Compound:** Use on exterior slabs and paving but subject to above restriction.
 - D. Sheet Curing:** Use the specified curing sheet material. Seal all laps and edges with plastic pressure-sensitive tape, and immediately repair tears during the curing period. Verify that surfaces remain damp for the full curing period; if necessary, lift sheet, wet surfaces with clean water, then replace and reseal the sheeting. Use on surfaces where curing compound is not permitted.
 - E. Water Curing:** Option to either liquid membrane-forming curing compound or sheet curing method. Keep concrete continuously wet for entire curing period.

- 3.04 CLEAN-UP: Contractor shall clean up all concrete and cement materials, equipment and debris upon completion of any portion of the concrete work and upon completion of the entire concrete and related work as specified in Section 01700.

END OF SECTION

SECTION 03720

ANCHORAGE TO EXISTING CONCRETE

PART 1 - GENERAL

- 1.01 DESCRIPTION: General Conditions and Division 1 apply to this Section. Provide anchorage to existing concrete by means of epoxy, dowels and anchors complete as indicated, specified, and required.
- A. Work In This Section:** Principal items include:
1. Epoxy, dowels and anchors.
- B. Related Work Not In This Section:**
1. Cast-in-place concrete.
 2. Steel reinforcement.
 3. Surface preparation.
- 1.02 QUALITY ASSURANCE: Refer to Section 01400 for general testing requirements. Testing Laboratory shall perform conformance testing on samples of epoxy, anchors and dowels from material at the site or from place of distribution, each sampling shall conform with latest edition of ACI Standards and Practices including pertinent regulations of local Codes and regulations apply.
- 1.03 SUBMITTALS: Refer to Section 01300 for procedures.
- A. Product Data:** Submit data for proprietary materials and items including epoxy compounds.
- B. Laboratory Test Reports:** Submit laboratory test reports for epoxy materials and pullout tests as specified.
- C. Shop Drawings:** Submit including complete installation, layouts, sections, and details of existing conditions, typical configurations, spacing and offsets, splice lengths, depth of embedment, surface preparation and locations, proposed epoxy anchors and dowels anchorage intersect. Install in accordance with latest edition of ACI Standard and Practices. After Engineer's approval of initial submission, subsequent submittals may be waived at the Engineer's discretion.
- 1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING: Deliver materials in timely manner to ensure uninterrupted progress. Store materials by methods that prevent damage and permit ready access for inspection and identification.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. **Epoxy Anchors and Dowels:** Unless otherwise noted furnish epoxy anchors and dowels by HILTI Hit-C-100 or covert inject adhesive-gel (CIA-GEL) anchors or approved equal systems by the Engineer for application or injection as designated on the drawings.
- B. **Reinforcements:** Provide reinforcing steel as specified in Section 03200.

PART 3 - EXECUTION

3.01 INSTALLATION OF ANCHORAGE TO EXISTING CONCRETE: Install in accordance with procedures designated in drawings, apply or inject epoxy compounds in strict accordance with the manufacturer's specifications and recommendations for each intended type of use.

- A. **Anchors and Dowels:** Provide all epoxy grouted anchors and dowels. At random for each concrete pour 10% percent of the anchors and dowels shall be tested in tension to twice the design allowable tension values as indicated on the Drawings. Deficient anchors and dowels shall be replaced and retested at the Contractors expense. The Engineer may change the frequency of tests as construction progresses.
 - 1. The depths to drill anchorage holes are indicated on the Drawings. The hole diameter shall be equal to the outside diameter of the anchor or dowel plus 1/8" unless otherwise recommended by the Epoxy Manufacturer. The holes shall be cleaned and dry per Manufacturer's recommendations prior to installation.
- B. **Reinforcements:** Install in accordance with approved Shop Drawings and Manufacturer's recommendations. The reinforcement in existing concrete shall not be cut or damaged by the new construction. The Contractor shall submit his procedures for identification of existing reinforcement and post-tensioned strands for Engineer's approval prior to commencing work. The reinforcing dowels related to this Section shall be free of all contaminates. The Contractor shall provide adequate means to support anchors and dowels in place during placing of new concrete.

3.02 FIELD QUALITY CONTROL:

- A. **Inspection:** Continuous inspection shall be provided during epoxy, anchor and dowel installation. Reinforcing bar placement shall be inspected and approved prior to concrete installation.

- B. Testing:** The testing laboratory shall perform appropriate tests of epoxy work and submit test reports.
- C. Field Tests:** The testing service will make additional pullout tests of in-place work for 10% of installed anchors. Tests shall be as directed by the Engineer and shall include tests at beginning of work for each size and condition of anchors and dowels.
- D. Schedule of Work:** Perform Work in existing facilities during such hours and by methods as are approved by Owner. Submit proposed schedules itemizing dates and hours that the various items of Work in existing facilities will be started and completed. Owner reserves the right to modify proposed schedules to eliminate conflicts and ensure use of existing facilities during the Work. Exactly follow the schedule as finally approved by Architect/Owner. No extra payment will be made to the Contractor for the Work required to be performed during night, Saturday, Sunday, or holiday hours. Revise and resubmit schedules when timing or sequence changes occur or are ordered by Owner/Architect.

END OF SECTION

SECTION 04220

CONCRETE UNIT MASONRY

PART 1- GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide concrete unit masonry complete as indicated, specified and required.

A. Work In This Section: Principal items include:

1. Concrete block masonry.
2. Grouting of masonry.
3. Installing reinforcing steel bars in masonry.

B. Related Work Not In This Section:

1. Furnishing and delivery of steel bar reinforcing.
2. Dowels in concrete for masonry.
3. Plaster over concrete unit masonry.
4. Testing and inspection per Section 01400 and UBC Chapter 21.

1.02 SUBMITTALS: Refer to Section 01300 for procedures. Provide mix design for grouting, submit to Structural engineer for approval.

1.03 PRODUCT DELIVERY, STORAGE, AND HANDLING: Deliver all masonry units on pallets and cementitious materials in unopened factory containers. Store materials in dry covered locations protected from moisture. Handle and store all units by methods that prevent cracking, chipping, or defacing.

1.04 JOB CONDITIONS: Refer to Section 01400. Inspect and verify surfaces to receive Work of this Section. Report to Architect all conditions that prevent correct installation of masonry.

PART 2 - PRODUCTS

2.01 BASIC MATERIALS:

Portland cement:	ASTM C150, Type II, low alkali. Masonry cement is not permitted. Use only one brand.
Hydrated lime:	ASTM C207, Type S.
Mortar sand:	ASTM C144, not less than 4% passing No. 100 sieve, uniformly graded from fine to coarse.
Grout sand:	ASTM C404, natural, Size No. 1.
Pea gravel:	ASTM C404, gravel, except maximum 5% passing No. 8 sieve and all passing a 3/8" sieve.
Mortar admix:	Red Label Suconem, Anti-Hydro, or equal.

Grout admix:	Sika Chemical Corp. GA Grout Aid, type as required; no substitution.
Color pigment:	Pure ground mineral oxides, non-fading, alkali and lime proof, factory packaged.
Water:	From domestic potable source.
Control joint filler:	Rapid Control Joint by Dur-O-Wal, wide flange unless regular is shown, approved sizes.

2.02 CONCRETE BLOCK MATERIALS: ASTM C90, Grade N-I, standard medium-weight aggregate units, steam-cured or yard cured for 28 days, meeting Quality Control Standards of Concrete Masonry Association, unit cement color and units face and texture shall match existing units as selected by Architect. Include matching jamb, lintel, control joint, bond beam, wall cap, and other special shape, type, or size units as required. Units at wall shall be open-ended if grouting is required. Units shall have a maximum liner shrinkage of 0.06% from saturated to overdry.

2.03 MORTAR AND GROUT PROPORTIONS AND MIXING:

- A. **Strengths:** Minimum compressive strengths of 1,800 psi for mortar and 2,000 psi for grout at 28 days. Minimum compressive at 7 days shall be 900 psi for mortar and 1200 psi for grout accordingly.
- B. **Proportions:** Accurately measure all mortar and grout by volume using calibrated containers. Shovel measurements are not acceptable.
 - 1. Mortar: Type S conforming to Building Code Table 24-A, with mortar admix in mortar for exterior masonry, quantity per manufacturer's directions. Mixing proportion shall conform to 1 part cement, 1/4 to 1/2 part lime and 2-1/4 to 3 parts sand.
 - 2. Color Mortar: Same as for mortar plus color pigment to produce cured dry color matching the approved Sample.
 - 3. Grout: By volume, 1 part portland cement, not over 3 parts damp loose sand, and 1 to 2 parts of pea gravel; or proportions as required for minimum 2,000 psi compressive strength. Include grout admix of the correct type, proportioned per manufacturer's directions.
- C. **Mixing:** Place half of water and sand in operating mixer; then add cement, lime, and the remainder of sand and water. Machine mix not less than 5 minutes after ingredients are charged.
- D. **Retemper Mortar** within one hour after leaving mixer to maintain high plasticity. Add water in a basin formed in the mortar and rework mortar into water. Discard mortar which is not used within one hour or that has begun to initially set.

PART 3 - EXECUTION

- 3.01 **INSTALLATION OF CONCRETE BLOCK MASONRY:** Lay out masonry to minimize cutting of units to 1/2 unit lengths (min. and max.) where exposed finish and use of odd joint sizes or bond. Construct masonry in accordance with Code and Concrete Masonry Association for reinforced masonry. Place and embed in masonry the anchors, bolts, reglets, sleeves, conduits, and all other items required by other trades, fully grouted in place. Work out the details and be responsible for size, position, and arrangement of embedded items and necessary openings. Cut units by machine saw. Install only clean un-cracked units.
- A. **Setting:** Install masonry to preserve unobstructed vertical continuity of cells. Full bed face shells and cross webs in mortar. Fill header or end joints solid with mortar for a distance in from face of wall or unit not less than thickness of longitudinal face shells. Provide corner bond by lapping units in successive vertical courses and discard units with cracks, chipped surfaces or defects per ASTM C216.
 - B. **Cleanout Openings:** Provide openings at bottoms of cells containing reinforcing, and at each lift or pour of grout exceeding 48" height. Remove all overhanging mortar and other obstructions or debris from interior of cells. Seal cleanouts with matching whole units and mortar joints.
 - C. **Reinforcing:** Use deep-cut bond beam units for horizontal bars. Place open end units for vertical bars unless otherwise shown. Hold vertical bars in position at top and bottom and at intervals not exceeding 192 bar diameters. Accurately set and place reinforcement as indicated. Hold vertical bars securely in place with wood frames or similar devices as necessary for correct alignment. Install horizontal reinforcing as erection progress, laps wire tied. Maintain minimum 3/4" clear distance between masonry and bars. Make laps and splices in bars not less than 40 bar diameters unless otherwise indicated.
 - D. **Grouting:** Fill all cells with grout, unless indicated otherwise on the drawings. Pour in 4-foot lifts, waiting about 1-hour between lifts. Pour the full height in each section of the wall in one shift. Consolidate grout by puddling or internal vibration, then reconsolidate about 10 minutes later before plasticity is lost. Form horizontal construction joints by stopping grout pour 1-1/2" below top of units. Do not pour grout until masonry has set a minimum of 3 days. Grout may be placed by pump, tremie or bucket using hoppers to avoid sag.
 - E. **Bond and Joints:** Lay units with 1/2-unit running bond, vertical joints aligned and plumb. Make all joints uniformly 3/8" size, concealed joints struck flush. Compact and dense concave tool exposed joints.
- 3.02 **WALL CONTROL JOINTS:** Provide in concrete block walls where shown, control joint filler placed for the full height of each joint. Calk exterior face of joints according to Section 07900.

- 3.03 **CURING:** Cure concrete unit masonry in one of the following: 1) Extremely Hot Weather, keep block damp with a regulated fog spray or water sufficient only to moisten faces of masonry, do not allow water to flow down over masonry. 2) In Rainy Weather, cover the top of the masonry with a 6 mil polyethylene sheet to repel water from entering masonry from top. 3) If other two procedures are not necessary the masonry can be cured by letting it stand in sunlite during 3 day curing period. For mortar, no other protection or application of water is necessary.
- 3.04 **CLEANING:** Clean mortar and grout off exposed surfaces immediately. Acceptably repair imperfect joints, holes, defaced units, chipped edges or corners, and all other defects or replace the defective units. Mortar or grout stains on exposed surfaces are subject to sandblast cleaning, as directed, to obtain clean uniform approved appearance, at no extra cost to Owner.
- 3.05 **FIELD QUALITY CONTROL:** Refer to Section 01400.
- A. Testing:** Testing Laboratory will test mortar and grout to the extent indicated, directed, or required by Code.
- B. Continuous Inspection:** Require when indicated, and for all high lift grouting operations.
- 3.06 **BRACING:** Adequately brace walls against wind or other forces during construction.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide rough carpentry complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Rough construction wood and plywood framing.
2. Wood blocking, grounds, backing, stripping, cants, and nailers as indicated, specified, or required for securing other Work, except for those items specified to be furnished by other trades.
3. Provide rough hardware incidental to Work of this Section and install steel non-standard framing connectors furnished under Division 5.
4. Wood preservative treatment.

B. Related Work Not In This Section:

1. Concrete forms.
2. Finish carpentry and millwork.
3. Casework and cabinet work.
4. Insulation.
5. Furnishing of steel non-standard wood framing connectors.

1.02 QUALITY ASSURANCE:

A. Requirements of Regulatory Agencies: Conform to CBC and Uniform Building Code, Chapter 23 for construction, nailing, and connections except as exceeded by requirements on Drawings or specified.

B. Supervision: Perform rough carpentry under the direction of capable experienced foreman.

1.03 PRODUCT DELIVERY AND STORAGE: Store lumber materials, plywood, and metal items off the ground, protected from rain and dampness.

1.04 JOB CONDITIONS: Coordinate with related trades and plan the framing and furring to accommodate structural members, finish materials, piping, conduits, ductwork, mechanical and electrical equipment, accessories, and fixtures.

PART 2 - PRODUCTS

2.01 LUMBER: Douglas fir and Larch, all S4S unless otherwise indicated or specified, manufactured, graded, and bearing grade mark of WCLIB Standard Grading Rules 16 or

WWPA Grading Rules, moisture content at time of enclosure not over 19% or less than 7%.

- A. Grades:** Use grades as scheduled, species as noted on Structural drawings.
 - 1. Miscellaneous. For blocking, nailers, and other non-stressed lumber, WCLIB "Economy", equivalent WWPA grade, or as scheduled for studs.
- B. Lumber Pressure Preservative Treatment:** Pressure treat all lumber for blocking, screeds, cants, nailers, grounds, stripping, rough bucks, plates, sills, and the like resting on or against steel, masonry, or concrete, or connected to roofing, in accordance with AWPA Standard C1 and AWPI Standard LP-2, each piece of lumber bearing the mark of an approved testing agency. Deliver to the site at maximum 14% moisture content. When necessary to cut, not, tap, bore, splice, or frame treated lumber, thoroughly paint newly cut surfaces with same preservative used in treatment of lumber.
- C. Plywood:** Provide Douglas fir plywood elsewhere conforming to PS 1-95, Group I, "Exterior" type, grade marked by recognized grading agency (APA), grades as noted on Structural Drawings. OSB panels may be allowed if approved by the Structural engineers. OSB panels shall conform to PS 2-92, Exposure-1. Use structural-1 sheathing for structural application (diaphragm and shear walls). Use plywood only at exterior walkways and deck surfaces.
- D. Fire-Retardant Treatment:** Provide as indicated on drawings and where required by the Building Code. Pressure treat to flame spread rating of 25 or less and fuel contribution of 30 or less when tested in accordance with ASTM E84, each piece bearing the UL label of conformance. Re-dry to maximum 14% moisture content.

2.02 ROUGH HARDWARE: Provide rough hardware required to complete the Work shown and specified. The term "rough hardware" includes bolts, nuts, nails, washers, lag screws, washers, plates, post and beam anchors, joist hangers, framing hangers, wood connectors, and similar items used for construction of rough wood framing. Non-standard steel framing connectors are specified in Division 5 and installed under this Section.

- A. Nails:** Provide common wire nails, sizes as indicated. Provide ring-shank nails for plywood on floors.
- B. Adhesive:** Elastomeric adhesive conforming to American Plywood Assn. Specification AFG-01 for "APA Glued Floor System".
- C. Bolts and Nuts:** ASTM A307, galvanized for exterior or exposed use.
- D. Washers:** As noted on Drawings, galvanized for exterior or exposed use.

- E. Stock Framing Connectors:** By "Simpson" or approved equal, types indicated or required, galvanized, with nails furnished by manufacturer of anchors used. Fully drive nails in all holes in anchors. If other than Simpson connectors are proposed for use, submit Code approval catalog data with proposed substitutions circled.

PART 3 - EXECUTION

- 3.01 **GENERAL:** Fabricate, install, connect and fasten, bore, notch, and cut wood and plywood framing with joints true, tight, and well-nailed, screwed, or bolted as required, all members with solid bearing without being shimmed. Set horizontal members subject to bending with crown up. Install framing plumb, square, true, and cut for full bearing. Splices are not permitted between bearings. Use full lengths except as detailed. The notching, drilling, splicing, or cutting of any structural member is not permitted without prior approval. Reinforce or replace wood framing members damaged by erroneous cutting as directed. Perform cutting for other trades under their direction. Wherever necessary to avoid splitting, sub-drill for nails and screws with diameter of hole smaller than that of nails or screws.
- 3.02 **NAILING:** Use nails or spikes of such lengths that penetration into second piece of wood is not less than one-half the nail or spike length, except 16d nails may be used to connect pieces of 2" nominal thickness. Set nails no closer together than one-half nail length, nor closer to wood edges than one-fourth nail length. Sub-drill holes where necessary to prevent splitting. Use of power driven nails is subject to approval by the Engineer. Demonstrate satisfactory installation of machine nailing at the site and obtain approval by Structural Engineer before using machine-applied nails; such approval is subject to continued satisfactory performance.

A. Nails and Spikes:

1. Furnish only common wire nails or spikes whenever indicated, specified or required.
2. Whenever necessary to prevent splitting, holes shall be pre-drilled for nails and spikes.
3. Nails in plywood shall not be overdriven.
4. Machine Applied Nailing: Use of machine nailing is subject to a satisfactory Project site demonstration for each Project and review by the Engineer. Installation is subject to continued satisfactory performance. Machine nailing is not permitted for 5/16" plywood. Do not permit nail heads to penetrate outer ply. Maintain minimum allowable edge distances when installing nails.
 - a. Powder Driven Fasteners:
 1. Loads shall not exceed 75 pounds unless indicated on the Drawings or when reviewed by the Architect.
 2. The operator, tool, and fastener shall perform the following as observed by the Engineer.
 - a. Observe installation of first 10 fasteners.

- b. Test the first 10 fasteners by performing a pullout test. Load shall be at least twice the design load, or 150 pounds, whichever is greater.
- c. Random testing:
 3. Load less than 75 lb. - approximately 1 in 10 pins.
 4. Load 75 lb. or greater - 1/2 of the pins.
 5. Failure of any test will result in testing of all installed pins.
 6. Nail heads shall not break the outer skin of sheathing.
 7. Non-compliant pins shall be replaced.

3.03 LAG SCREWS. Place by screwing; do not hammer drive into place. Install screws with anchorage embedment in piece lagged of not less than 60% of screw length or 8 diameters. Provide standard malleable iron or steel plate washer under heads. Bore a hole of same diameter and depth as shank. For threaded portion of screw, bore the hole with a bit not larger than base of thread.

A. Lag Screws:

1. When installing lag screws in a wood member, pre-drill hole as recommended by CBC.
2. Lag screws, which bear on wood, shall be fitted with standard steel plate washers under head. Lag screws shall be screwed and not driven into place.

3.04 BOLTS: Clamp members together and bore holes true to line and 1/32" larger than bolt diameter. Provide standard malleable iron or steel washers under heads and nuts when bearing on wood. Draw nuts up tight as installed and again just prior to being enclosed with other materials or at completion.

A. Bolts:

1. Lumber and timber to be fastened together with bolts shall be clamped together with holes for bolts bored true to line.
2. Bolts shall be fitted with steel plates or standard cut washers under heads and nuts. Bolts shall be tightened when installed and again before completion of the Work of this section.

3.05 WOOD SCREWS: When installing wood screws, pre-drill holes as recommended by CBC/UBC.

3.06 FRAMING ANCHORS: Framing anchors, joist hangers, ties, and other mechanical fastenings shall be galvanized or furnished with a rust inhibitive coating. Nails and fastenings shall be of the type recommended by manufacturer.

3.07 SILLS ON CONCRETE OR MASONRY: Anchor as indicated or required by Code. Tighten with washers and nuts to level bearing. Use pressure treated lumber or approved redwood.

3.08 STUD WALLS, PARTITIONS AND FURRING:

- A. **Wood stud walls**, partitions and vertical furring shall be constructed of members of size and spacing indicated. Provide single plate at bottom and double plate at top unless otherwise indicated. Interior, nonbearing non-shear partitions may be framed with a single top plate, installed to provide overlapping at corners and at intersections with other wall and partitions or by metal ties as detailed.
- B. **Walls and partitions** shall be provided with horizontal staggered blocking at least 2" nominal thickness and same width as studs, fitted snugly, and nailed into studs. Blocking shall be installed at mid-height of partition or not more than 7 feet on center vertically. Install wood backing on top of top plate wherever necessary for nailing of lath or gypsum board.
- C. **Walls, partitions and furred spaces** shall be provided with 2" nominal thickness wood firestops, same width as space to be firestopped, at ceiling line, mid-height of partition and at floor line. Firestops at floor line are not required when floor is concrete. If width of opening is such that more than one piece of lumber is necessary, provide 2 thicknesses of one inch nominal material installed with staggered joints.
- D. **Firestops shall be** installed in stud walls and partitions, including furred spaces, so the maximum dimension of any concealed space is not over 10 feet.
- E. **Corners, and where wood** stud walls and wood vertical furring meet, shall be constructed of triple studs. Openings in stud walls and partitions shall be provided with headers as indicated and a minimum of 2 studs at jambs, one stud of which may be cut to support header in bearing.
- F. **Where wood masonry or concrete** walls intersect, end stud shall be fastened at top, bottom and mid-height with one 1/2" diameter bolt through stud and embedded in masonry or concrete a minimum of 4". Bolts shall be provided with washers under nuts.
- G. **Sills under bearing, exterior** or shear walls shall be bolted to concrete with 5/8" diameter x 12" long bolts spaced not more than 4 feet on center. There shall be a bolt within 9" of each end of each piece of sill plate. Sills shall be installed and leveled with shims, washers, with nuts tightened to level bearing. Space between sill and concrete shall be dry packed with cement grout.

3.10 CEILING FRAMING: Provide joists as shown, placed with crowning edge up. Conform to the following requirements unless otherwise indicated.

A. **Ceiling Framing:**

- 1. Wood joists shall be of the size and spacing indicated, installed with crown edge up, and shall have at least 4" bearing at supports. Provide 2"

- solid blocking, cut in between joists, same depth as joists, at ends and bearings, unless otherwise indicated.
2. Floor joists of more than 4" in depth and roof joists of more than 8" in depth shall be provided with bridging. Floor joists shall be bridged every 8 feet with solid blocking or metal cross bridging. Roof joists shall be bridged every 10 feet.
 3. Joists under and parallel to bearing partitions shall be doubled and nailed or bolted together as detailed. Whenever a partition containing piping runs parallel to floor joists, joists underneath shall be doubled and spaced to permit passage of pipes and blocked with solid blocking spaced at not more than 4 feet intervals.
 4. Trimmer and header joists shall be doubled, when span of header exceeds 4 feet. Ends of header joists more than 6 feet long shall be supported by framing anchors or joist hangers unless bearing on a beam, partition, or wall. Tail joists over 12 feet long shall be supported at header by framing anchors or on ledger strips at least 2 x 4.
 5. Provide solid blocking between rafters and ceiling joists over partitions and at end supports where indicated.

B. Beams, Girders and Joists:

1. Ends of wood beams, girders and joists which are 2 feet or less above finished outside grade and which abut, but do not enter concrete or masonry walls, as well as wood blocking used in connection with ends of those members shall be treated with wood preservative.
2. Where wood beams, girders and joists enter masonry or concrete walls 2 feet or less above outside wall, metal wall boxes or equivalent moisture barriers shall be provided between wood and masonry or concrete.

C. Bridging: Provide 2" solid wood blocking, cut in between joists for same depth as joist, as indicated.

- 3.11 **NAILING STRIPS AND PLATES:** Provide wood nailing strips, plates, and blocking as shown or required, securely nailed or screw fastened in place. Bolt wood strips and plates to metal. Use treated lumber for members on concrete or masonry.
- 3.12 **WOOD BACKING:** Provide wood backing to receive mechanical or electrical fixtures and equipment, bases, cabinets, door stops, wall plates, toilet accessories and partitions, and other fixed equipment or other fixed items, as indicated or required, securely nailed or screw fastened to framework. Coordinate locations with related trades.

END OF SECTION

SECTION 07270

FIRESTOPPING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide firestopping and smoke seals complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. All openings in fire-rated floors and walls both empty and those accommodating penetrating items such as cables, conduits, pipes, ducts etc.
2. Head of wall openings between walls and connecting floors or roof assemblies.
3. Expansion joints in fire-rated walls and floors.

B. Related Work Not In This Section:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Vertical fire spread at exterior curtain walls.

1.02 QUALITY ASSURANCE: Firestopping materials shall conform to ratings as per ASTM E-814 (UL-1479). The ratings must be a minimum of one hour, but not less than the fire resistance rating of the assembly being penetrated. Fire tests shall be conducted with a minimum positive pressure differential of 0.03" of water column. Systems and materials must be listed by one of the appropriate agency: UL, ICBO, California State Fire Marshal.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Product Data: Within 35 calendar days after the Contractor has received the Owners notice to proceed, submit:

1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications, test data, and other data required to provide compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

- 1.04 **PRODUCT HANDLING:** Protect the materials of this Section before, during and after installation, and protect the work and materials of all other trades. In the event of damage, immediately make replacements and repair to the approval of the Architect and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 FIRESTOPPING:

- A. Manufacturers:** Where firestopping or smoke seals are called for on the Drawings or as specified herein, provide materials manufactured by one (1) of the following manufacturers:

1. Hilti Corporation
2. Dow Corning Corp., (517)496-4000.
3. 3M Contractor Products, (800)328-1687.
4. USG, (800)964-4874.
5. Tremco, Trimstop, (800) 551-3949

- B. Materials:** All materials shall restrict the transmission of temperature as well as the passage of flame, smoke and water. Materials shall be tested under ASTM E-814 (UL 1479) and pass.

1. Firestop Mortar: Single component portland cement/fly ash mortar. Requiring no support or anchoring devices to pass water hose stream tests.
2. Firestop Sealant: Single component sealant, use gun grade for walls and overhead. Intumescent, endothermic sealant, caulk or mastic as required by Code for approval.
3. Backing Material: Mineral wool, 4 pcf thickness manufactured by USG or approved equal.
4. Firestop Sleeve: Fabricated sleeve, collar or boot used around plastic pipe and other penetrations in fire-rated walls.
5. Firestop Compound: Firestop compound as required by system for Code approval.
6. Metal Components: Provide metal components as required by system manufacturer to meet fire test requirements.
7. Firestop Wrap Strips: Use intumescent wrap strips as required for Code approval.
8. Firestop Pillow System: A moisture resistive sensitive bag containing semi-intumescent material.
9. FireMaster Duct Protection System: A encapsulated fireproof blanket system for up to a 2 hour UL rating.
10. Safing Insulation: UL approved, incombustible, by USG, Tremco, or equal, with Code approved galvanized steel closures, clips, and ties to secure insulation and conform to Code.

PART 3 - EXECUTION

- 3.01 SURFACE CONDITIONS: Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- 3.02 PREPARATION: Prepare the surface in accordance with approved manufacturer's recommendations.
- 3.03 APPLICATION: Apply the approved system and product to the designated surfaces in strict accordance with the manufacturer's recommended application procedures meeting Code requirements and approved by Architect. Firestop systems and materials shall have no adverse effect on the overall fire-rating or structural integrity of the wall or floor assembly.

END OF SECTION

SECTION 07900

CALKING AND SEALANTS

PART 1 - GENERAL

- 1.01 DESCRIPTION: Division 1 applies to this Section. This Section covers calking of openings and joints indicated, specified, and required to make the entire building weatherproof and watertight and also covers calking requirements for the entire Work and pertains to any Section requiring calking, unless specified in that Section otherwise. Coordinate with Firestopping Section 07270 for fire rated joint materials and Painting Section 09900 for coordination between calking and paint adhesion requirements.
- 1.02 QUALITY ASSURANCE: Provisions of the General Conditions will apply. Employ a specialist calking contractor having not less than 5 years experience in calking installations of size and complexity required for the Work. Prior to award of any subcontract for calking, submit qualifications and project history of the proposed Calking Subcontractor.
- 1.03 SUBMITTALS: Refer to Section 01300 for procedures.
- A. Samples and Data:** Submit the following:
1. Samples of cured sealants showing full range of designated colors; obtain color instructions from Architect prior to submittal.
 2. Technical data by manufacturers of proposed materials.
 3. Material manufacturers' printed preparation and application instructions; when approved, furnish copies to other trades.
- 1.04 PRODUCT DELIVERY: Deliver calking and sealant materials in unopened factory labeled containers, each label bearing statement of conformance to standards specified for each material.
- 1.05 WARRANTY: Furnish a written warranty against defects in materials for 5 years and defects in workmanship for 2 years, covering all loss of adhesion or cohesion, deterioration, color changes, leaking, and other defects.

PART 2 - PRODUCTS

- 2.01 MANUFACTURERS: Provide sealants by one or more of the following manufacturers; Pecora Corporation, Dow Corning, Tremco, Sonneborn, General Electric and Johns Manville or approved equals.
- 2.02 MATERIALS: Furnish sealants meeting following in-service requirements: Normal curing schedules are acceptable; Non-staining, color fastness (resistance to color change), and durability when subjected to intense actinic (ultra-violet) radiation are required. Furnish the products of only one manufacturer unless otherwise approved, sealant colors

as selected to match the adjoining surfaces; special colors may be required. Use sealants selected from the following types where required on drawings and as appropriate to the joint being sealed.

- A. Type A Sealant:** NR 200 Urexpan Sealant, self-leveling two-part urethane Type I, conforming to FS SS-T-00227 and ASTM D1850 as manufactured by Pacora or approved equal.
- B. Type B Sealant:** Dymeric Sealant, three-part expoxidized polyurethane sealant conforming to FS SS-T-00227 Type II, Class A as manufactured by Tremco or approved equal.
- C. Type C Sealant:** Dow Corning 999 Silicone Glazing Sealant, one-part silicone rubber sealant conforming to FS TT-S-001543A and FS TT-S-00230C or approved equal.
- D. Type D Sealant:** Sikaflex 1A polyurethane conforming to FS TT-S-00230C, Type II, Class A or approved equal.
- E. Type E Sealant:** Sanitary 1700 Silicone Rubber Sealant with mold inhibitors, as manufactured by General Electric or approved equal.
- F. Type F Sealant:** Type 3-6548 Silicone RTV foam as manufactured by Dow Corning or RTV850 as manufactured by General Electric or Fire Resistant Joint Sealing System as manufactured by Trimco with backup of Cerablanket-FS backups, primers and bond breakers as manufactured by Johns Manville.
- G. Type G Sealant:** Proglaze System, including silicone construction sealant, Polyslim Tape, Poly-Wej gasket, Aro-Shim spacer and CCN sponge, as manufactured by Trimco or approved equal.
- H. Type H Sealant:** Trimco Acoustical Sealant or approved equal.
- I. Type I Sealant:** Trimco Proglaze or approved equal.
- J. Type J Traffic Bearing Application:** Furnish multi-component self leveling, non-tracking sealant with Shore "A" Hardness range of 40 to 55 where subject to foot or vehicular traffic, meeting requirements of ASTM 920-79 or Federal Specification TT-S-227E, "Sealing Compound, Elastomeric Type, Multi-Component".
 - 1. HPL, by Tremco.
 - 2. SL-2, by Sonneborn.
 - 3. Dynatred, by Pecora.

- K. Sealant Primer:** Non-sagging sealant meeting requirements of ASTM C920-79. Sealant primer as recommended by sealant manufacturer.
- L. Joint Cleaner:** Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- M. Joint Backing Material:** ASTM D1056 or ASTM D1565; round, closed cell polyethylene urethane or neoprene foam rod; oversized 30 to 50 percent larger than joint width; Ethafoam manufactured by Pacora.
- N. Bond Breaking:** Pressure sensitive tape as recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

- 3.01 **INSPECTION:** Refer to Section 01450. Inspect surfaces and joints to be calked. Report to Architect in writing all conditions that prevent correct preparation, priming, and calking installation.
- 3.02 **TECHNICAL ASSISTANCE:** Furnish sealant manufacturer's technical field assistance as required to ensure proper use of sealants, preparation, and application.
- 3.03 **PREPARATION AND PROTECTION:** Conform to sealant manufacturer's instructions and apply materials to clean dry surfaces free of grease, oil, wax, or other matter that destroys or impairs adhesion. Remove lacquer and apply temporary masking tape on both sides of joints where surface staining may occur. Fill joints with joint backing material until the joint depth does not exceed 50% of joint width. Provide bond breaker to prevent bonding of sealant to backing material wherever joints exceed 1/2" width, or joint width is shown or required to exceed depth. Prime surfaces as required by manufacturer's instructions.
- 3.04 **APPLICATION:** Do not exceed 3/8" sealant depth unless specifically dimensioned. Minimum joint width is 1/8" for metal to metal joints and maximum 3/4" width elsewhere unless otherwise shown. Apply all sealant under sufficient pressure to fill voids. Finish exposed joints smooth and flush with adjoining surface unless recessed joints are shown. Remove temporary masking as soon as joint is completed.
- 3.05 **SCHEDULE:** Sealants shall conform to the following application schedule
 - A.** Expansion and Control Joints in Masonry and Concrete. - Type B.
 - B.** Expansion and Control Joints in Glass, Aluminum and Plastic. - Type C.
 - C.** Expansion and Control Joints in Horizontal Traffic Surfaces. - Type A

- D.** Nonexpanding Joints in Concrete, Masonry, Aluminum, Steel and Wood: - Type D
 - E.** Nonexpanding Joints in Glass and Plastic: - Type A
 - F.** Around Plumbing Fixtures in Toilet and Bath: - Type E
 - G.** Mechanical, Ductwork and Air Conditioning: - Type D
 - H.** Acoustical Applications: - Type H
 - I.** At Floor, Wall and Ceiling Penetrations Requiring Vibration Isolation, Sound or Fire Rating: - Type F
 - J.** At Window Wall Where Channel Glazing is Required: - Type I
 - K.** Cross Joints in all Copings: - Type D
 - L.** Any Gypsum Board Joints and/or Settings: - Type D
 - M.** For Sink Areas Including Countertop Joints: - Type C
 - N.** Intersection of Wall Surface and Metal Cap Strip at Resilient Flooring Integral Cove Sealant: - Type D
 - O.** Traffic Bearing Application: - Type J
- 3.06 **CLEANING:** Clean material from surfaces not to receive sealant and restore the finish as required. If surfaces adjoining joints are stained and cleaning is not acceptable, remove the affected Work and provide new Work as directed and approved, at no extra cost to Owner.

END OF SECTION

SECTION 08110

HOLLOW METAL

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide hollow metal items complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Hollow metal doors.
2. Hollow metal frames.

B. Related Work Not In This Section:

1. Installation of hollow metal doors and frames.
2. Furnishing finish hardware for hinged metal doors.
3. Glazing in hollow metal.
4. Grouting or back-plastering of hollow metal frames.

1.02 QUALITY ASSURANCE:

A. Requirements of Regulatory Agencies: Construct labeled openings in accordance with SDI Standards and Specifications, ANSI/SDI-100 and manufacturer's standard procedures filed with and approved by UL. In accordance with NFPA provide required UL and WHI labels on doors and frames.

B. Tolerances: Provide hollow metal door and frame assemblies having maximum 3/32" gap between top and side edges of wider door face and frame after installation, and maximum 1/4" clearance above finish floor except as otherwise required by floor finish material; provide maximum 3/32" gap between door edges at meeting stiles of pairs of doors.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Shop Drawings: Submit Shop Drawings fully detailing materials, finishes, sizes, profiles, moldings, location of hardware items with reinforcement, and methods for anchoring, assembly, and erection.

B. Samples: Submit following Samples if requested by Architect:

1. Frame corner construction.
2. Door panel and edge construction.
3. Glazing stop corners.

C. Product Data: Submit certified test reports for STC-rated doors.

PART 2 - PRODUCTS

2.01 MATERIALS: As supplied by one of following manufacturers subject to conformance with requirements herein; refer to Section 01600 for substitutions:

1. Overly Manufacturing Co.
2. Krieger Steel Products Co.
3. Steelcraft Manufacturing Co.
4. Amweld Metal Doors and Frames.
5. Ceco Door Products.
6. Republic Builders Products.

A. Types: The sizes, types, thicknesses, profiles, details, and features indicated for doors and frames govern. In all other respects, provide doors and frames as standard with manufacturer except as specified herein. Where doors and frames are to be exterior type, provide galvanized steel shop primed in lieu of steel.

B. Hollow Metal Doors: Flush seamless type, 16 gage steel exterior applications and 18 gage at interior applications, one-piece face panels, all parts welded and finished flush and smooth. Reinforce face panels with internal welded stiffeners, or bond to a plastic-treated honeycomb core or a foamed plastic core except foamed plastic is not allowed for labeled doors. Fill hollow core doors with mineral wool material to eliminate all metallic ring. Insulated doors fabricated by Ceco Imperial Series foamed polyurethane core with a R-14.97 rating, U-0.067 rating and STC of 26. Provide flush top edges of exterior doors. Reinforce the top, bottom, and both edges according to manufacturer's standards. Finish both face panels and all edges smooth and free of seams and distortion. Provide 1-3/4" by 12 gage full-height astragal on active leaf of pairs of doors.

1. Glazed Lights In Doors: Manufacturer's standard steel assembly, one side integral with door and other side equipped with applied steel stops of minimum 18 gage steel, one piece lengths, secured within 3" of ends and at 9" centers with oval-head screws.

C. Hollow Metal Frames: Form the stops integral with frames. Reinforce heads over 42" wide with a full-length 12 gage channel. Provide frame anchors as required, not less than 3 anchors per jamb, except 4 anchors for openings over 7'-0" high. Provide galvanized steel plaster guards back of cutouts for hinges or mortised hardware on frames installed in concrete, masonry, or plaster. Fabricate frames of 14 gage or heavier gage steel if required by UL label requirements.

1. Exterior Frames: Fabricate exterior frames of minimum 16 gage steel, weld all joints, all exposed welds ground smooth and flush.
2. Interior Frames: Fabricate interior frames of minimum 16 gage steel, weld all joints ground smooth and flush

- D. **Hardware Preparation:** Prepare, reinforce, mortise, drill, and tap the doors and frames according to the templates supplied by the hardware supplier, reinforcing as standard with door and frame manufacturer except minimum 10 gage steel behind butts and 12 gage steel for mortised or surface-applied hardware. Conform to ANSI A115 Series as applicable to the hardware specified in Section 08710 unless otherwise indicated.

- E. **Finish:** Thoroughly clean all surfaces and chemically treat for paint adhesion. Paint inaccessible surfaces before assembling. Sand exposed surfaces of hollow metal and accessories and make smooth with mineral filler as required. Apply a baked-on coat of manufacturer's standard rust inhibitive primer, including all interior surfaces of door frames.

PART 3 - EXECUTION

3.01 **EXAMINATION:** Examine supporting structure and conditions under which hollow metal is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 **INSTALLATION**

- A. **Install hollow metal in accordance** with reviewed shop drawings and manufacturer's printed instructions. Securely fasten and anchor work in place without twists, warps, bulges or other unsatisfactory or defacing workmanship. Set hollow metal plumb, level, square to proper elevations, true to line and eye. Set clips and other anchors with Ramset "shot" anchors or drill in anchors as approved. Units and trim shall be fastened tightly together, with neat, uniform and tight joints.

- B. **Placing Frames:** Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreaders leaving surfaces smooth and undamaged. In masonry construction, building-in of anchors and grouting of frames with mortar is specified in Section 04220 - Concrete Unit Masonry. Install all frames plumb, straight, in true alignment, rigidly connected to walls and building structure. Erect in proper sequence with other trades to prevent delays. Erect within the tolerances specified or shown in the approved submittals.

- C. **Place fire-rated frames** in accordance with NFPA Standard #80.

- D. **Door Installation:** Fit hollow metal doors accurately in their respective frames, within following clearances: Jambs and head 3/32 inch, meeting edges pair of doors 1/8 inch, sill where no threshold 1/4 inch above finished floor. Place fire-rated doors with clearances as specified in NFPA Standard #80.

3.03 ADJUSTING AND CLEANING

- A. Prime Coat Touch-Up:** Immediately after installation, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Protection Removal:** Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION

SECTION 08210

WOOD DOORS

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Furnish and deliver wood doors complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Wood doors.
2. Wood Bi-fold interior doors, match existing.
3. Installation of wood doors including hardware.

B. Related Work Not In This Section:

1. Hollow metal door frames.
2. Furnishing finish hardware for wood doors.
3. Glass and glazing.
4. Finish painting except for prefinished wood doors.

1.02 QUALITY ASSURANCE:

A. Reference Standard: Furnish doors conforming to National Wood Window and Door Association (NWWDA) and WI Manual for Hardwood Veneered Flush Doors unless otherwise required herein.

B. Rejected Doors: Furnish new doors conforming to requirements of this Section as replacements for doors rejected because of damaged surfaces, improper fitting or hardware preparation, or other cause, at no extra cost to Owner. Patching is not permitted for correction of defects.

C. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with UL and NFPA 80 "Standard for Fire Doors and Windows", and have been tested, listed and labeled in accordance with ASTM E152 "Standard Methods of Fire Test of Door Assemblies", by a nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.

D. Labeled Fire Doors and Frames: Doors and Frames designated to be labeled shall bear either UL or the "Warnock Hersey International Inc." label. The Door and Frame supplier must be a Warnock Hersey authorized door and frame supplier. Rating of assembly shall be as listed in door schedule.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Samples: Submit Samples of the following unless waived by Architect.

1. Face veneer.
2. Door construction.
3. Baked enamel finish colors for specified items, conforming to Architect's prior instructions.

B. Product Data: Submit the following:

1. Manufacturer's specifications for all wood doors.

C. Certificates: Submit certificates by manufacturer that doors supplied conform to or exceed requirements of these Specifications.

1.04 WARRANTY: Refer to Section 01740 for warranty form. Furnish to Owner a written warranty, subject to provisions of the WI Manual or NWWDA "Standard Door Guarantee" except as modified herein, against defects in materials and workmanship for the following periods:

- | | | |
|----|--------------------------|--------------|
| 1. | Solid core panel doors - | 2 years. |
| 2. | Interior flush doors - | Life of door |

PART 2 - PRODUCTS

2.01 MANUFACTURE: By one of the following manufacturers subject to conformance with requirements shown or specified; refer to Section 01600 for substitutions:

Eggers Industries, Inc. (920) 793-1351
Marshfield Door Systems, Inc. (650) 579-5829

2.02 SOLID CORE WOOD DOORS: Solid core, conforming to the above reference standard and to requirements herein, either 5-ply for transparent finish, as approved by the Architect.

A. Core: Staved glued low-density lumber core, or solid particleboard core with minimum 28 pcf density conforming to Type I, Density C, Class I of CS 236, hot press resin bonded.

B. Edges: Minimum total 1-1/18" wide top and bottom rails with minimum 1/2" thick hardwood edge banding, and minimum total 1-3/8" wide stiles with minimum 1/2" thick hardwood edge banding, 1-piece or laminated. Fully bond laminated edge strips together and to core before cross banding is applied. Provide vertical edge banding of species to match face veneers for transparent finished doors.

- C. **Crossbanding:** For 7-ply doors, two layers of minimum 1/16" thick hardwood extending to four edges of door, grain applied vertical and horizontal.
 - D. **Face Veneer:** Of following type:
 - 1. Opaque paint finished interior doors - "Sound" grade birch or other dense closed grain hardwood, or a paintable medium density plastic overlay to match existing.
 - E. **Adhesives:** For interior doors, Type I or II for cores, crossbanding, and face veneers.
- 2.03 Labeled Solid Core Wood Doors: Face veneers as specified above, conforming to UL re-examination label requirements for the rating scheduled, bearing required UL label on hinge stile. Provide lock blocks 5" wide at top and bottom rails and where required for hardware reinforcement. For fire rated doors use mineral cores and fire treated stiles.
- 2.04 Door Louvers: Inverted chevron units with straddle type frames, minimum 20 gage steel, welded construction, Air Louvers Ltd. 600-A, Anemostat-West CHDL-2F, or equal, with factory baked enamel finish to match door frames.
- 2.05 Hollow Core Doors: Same as solid core doors, including face veneers and edges, except hollow core construction of manufacturer's "Institutional" grade; include a horizontal rail near mid-height. Provide lock blocks on both stiles, minimum 4" by 24", and minimum 10" high solid top and bottom rails.
- 2.06 Prefinished Wood Doors: After prefitting and premachining for hardware, finish wood doors at the factory or mill in accordance with Section 09900 using stain and lacquer for transparent finish and enamel for opaque paint finish. Include finishing on top and bottom edges of doors.
- 2.07 Sealing: Seal all door edges with clear resin sealer at factory or mill, except prefinished doors.

PART 3 - EXECUTION

- 3.01 Installation of Wood Doors: Install doors in accordance with NWWDA and WI Manual requirements except as modified herein. Field trimming of prefit doors is not allowed. Fit doors square and plumb with frames with due allowance for possible swelling and shrinking, maximum 1/8" clearance at top, edges, and meeting stiles, and 3/8" clearance at sill unless otherwise indicated or required by floor or threshold finish. Round arises to 1/16" radius. Bevel lock stiles to conform to lock and latch hardware.
- 3.02 Installation of Finish Hardware: Install hardware supplied under Section 08710, excluding only hardware specified to be installed at the factory or under other Sections. Drill pilot holes for screws and screw home; hammer driving of screws is not

allowed. After installation and fitting, remove finish hardware items on surfaces to be painted, except prime coat items, repack in original containers, and perform final installation, testing, and adjustment after finish painting is completed. Adjust hinges to swing smoothly but not loosely, without sticking or hinge-bound conditions. Adjust other hardware for correct operation.

END OF SECTION

SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.01 SUMMARY: Refer to drawings for Finish Hardware Schedule

A. Section Includes:

1. Door hardware for wood and hollow metal doors.
2. Aluminum entrance doors.

B. Related Sections:

1. Section 06200 - Finish Carpentry: Finish Hardware Installation.
2. Section 07900 - Joint Sealers – exterior thresholds.
3. Section 08110 - Hollow Metal.
4. Section 08210 - Wood Doors
5. Section 08400 - Aluminum Interior Entry Doors

C. Specific Omissions: Hardware for the following is specified or indicated elsewhere.

1. Windows.
2. Cabinets, including open wall shelving and locks.
3. Signs.
4. Toilet accessories, including grab bars.
5. Installation.
6. Rough hardware.
7. Access doors and panels.
8. Corner Guards.
9. Railing, gates and supports.

1.02 REFERENCES:

- A. Use date of** standard in effect as of Bid date.
- B. American National Standards Institute** – ANSI 156.18 – Materials and Finishes.
- C. ANSI A117.1** – Specifications for making buildings and facilities usable by physically handicapped people.
- D. ADA** – Americans with Disabilities Act of 1990
- E. BHMA** – Builders Hardware Manufacturers Association
- F. DHI** – Door and Hardware Institute
- G. NFPA** – National Fire Protection Association
 1. NFPA 80 – Fire Doors and Windows
 2. NFPA 101 – Life Safety Code
 3. NFPA 105 – Smoke and Draft Control Door Assemblies

- 4. NFPA 252 – Fire Tests of Door Assemblies
- H. UL** – Underwriters Laboratories
 - 1. UL10C – Fire Tests of Door Assemblies (Positive Pressure)
 - 2. UL 305 – Panic Hardware
- I. WHI** – Warnock Hersey Incorporated
- J. State of California** Building Code
- K. Local applicable codes**, e.g. municipal security codes, etc.
- L. SDI** – Steel Door Institute
- M. WDI** – Wood Door Institute
- N. WI** – Woodwork Institute
- O. NAAM** – National Association of Architectural Metal Manufacturers

1.03 SUBMITTALS & SUBSTITUTIONS

- A. SUBMITTALS:** Submit six copies of schedule per Division 1. Organize vertically formatted schedule into “Hardware Sets” with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:
 - 1. Type, style, function, size, quantity and finish of hardware items. Use BHMA Finish codes per ANSI A156.18.
 - 2. Name, part number and manufacturer of each item.
 - 3. Fastenings and other pertinent information.
 - 4. Location of hardware set coordinated with floor plans and door schedule.
 - 5. Explanation of abbreviations, symbols, and codes contained in schedule.
 - 6. Mounting locations for hardware.
 - 7. Door and frame sizes, materials and degrees of swing.
- B. Bid and submit manufacturer’s** updated/improved item if scheduled item is discontinued.
- C. Make substitution requests** in accordance with Division 1. Include product data and indicate benefit to the Project. Furnish operating samples on request.
- D. Furnish as-built/as-installed** schedule with closeout documents, including keying schedule, manufacturers’ installation, adjustment and maintenance information, and supplier’s final inspection report.

1.04 QUALITY ASSURANCE:

- A. Qualifications:**
 - 1. Hardware supplier: Direct factory contract supplier who employs a Certified Architectural Hardware Consultant (AHC), available at reasonable times during course Work for project hardware consultation to Owner, Architect and Contractor.
 - a. Responsible for detailing, scheduling and ordering of finish hardware.

- B. Hardware:** New, free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from one manufacturer. Mounting height of latching hardware shall be 30" to 44" A.F.F. per CBC Section 1133B.2.5.1. Pressure to operate door shall not exceed: 5 lbs. (38 N) for exterior doors, 5.0 lbs (38 N) for interior doors and when fire doors are required 5 lbs. (38 N) maximum or the maximum effect to operate the door may be increased to the minimum allowable by the appropriate administrative authority, not to exceed 15 lbs. (66.72 N) per 1133B.2.5. All hardware shall meet the requirements of CBC Section(s) 1133.B.2.1, 1133B.2.5.1 AND 1003.3.1.8.
- C. Exit Doors:** Operable from inside with single motion without the use of a key or special knowledge or effort.
- D. Fire-Rated Openings:** In compliance with NFPA 80. Hardware UL10C/UBC-7-2 (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved-bearing hinges, plus resilient and required intumescent seals. Furnish openings complete.
- E. Pre-Installation Meetings:** Initiate and conduct with supplier, installer and related trades, coordinate materials and techniques, and sequence complex hardware items and systems installation. Convene at least one week prior to commencement of related work.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Delivery:** Coordinate delivery to appropriate locations (shop or field).
- B. Acceptance at Site:** Items individually packaged in manufacturers' original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers.
- C. Storage:** Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc...

1.06 PROJECT CONDITIONS:

- A. Where exact types** of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical as the same operation and quality as type specified, subject to Architect's approval.

1.07 SEQUENCING AND COORDINATION:

- A. Coordinate** with concrete.
- B. Reinforce** walls.
- C. Coordinate finish** floor materials and floor-mounted hardware.

- D. Conduit and raceways** as needed for electrical, electronic and electro-pneumatic hardware items. Fire/life-safety system interfacing. Point-to-point wiring diagrams plus riser diagrams to related trades.
- E. Furnish manufacturer** templates to door and frame fabricators.
- F. Use hardware consultant** to check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.
 - 1. Confirm that door manufacturers furnish necessary UBC-7-2 compliant seal packages.

1.08 WARRANTY:

- A. Part of respective manufacturers' regular terms of sale. Provide manufacturers' warranties:**
 - 1. Closers: Ten years mechanical, two years electrical.
 - 2. Exit Devices: Three years.
 - 3. Hinges: Life of Building.
 - 4. Other Hardware: Two years.

1.09 COMMISSIONING:

- A. Test door hardware** operation with climate control system and stairwell pressurization system both at rest and while in full operation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS: Corbin-Russwin Lock Bodies and Falcon Locksets/Latchsets are the City Standard – No Substitutions

- A. Listed of Manufacturers:** Refer to Schedule on Drawings.
- B. Provide hardware items** required to complete the work in accordance with these specifications and manufacturers' instructions.
 - 1. Include items inadvertently omitted from this specification. Note these items in submittal for review.
 - 2. Where scheduled item is now obsolete, bid and furnish manufacturers updated item at no additional cost to the project.

2.02 HANGING MEANS:

A. **Conventional Hinges:** Hinge open widths minimum, but, of sufficient throw to permit maximum door swing. Steel or stainless steel pins and concealed bearings.

1. Three hinges per leaf to 7 foot height. Add one for each additional 30 inches in height, or any fraction thereof.
2. Extra heavy weight hinges on doors over 3 foot, 5 inches in width.
3. Outswinging exterior doors: non-ferrous with non-removable (NRP) pins.
4. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.
5. Provide shims and shimming instructions for proper door adjustment.

B. **Continuous Hinges:**

1. Geared-type aluminum at exteriors: Include a non-removable cap to guard against foreign material, e.g. sticks, sand, epoxy etc.
 - a. Heavy-duty, double-bearing units for doors over 3 foot, 5 inches in width.
 - b. Heavy-duty, double-bearing units for doors with panic hardware or fire exit devices.

2.03 LOCKSETS, LATCHSETS, DEADBOLTS:

A. **Mortise Locksets and Latchsets:** As scheduled.

1. Chassis: Cold-rolled steel, handing field-changeable without disassembly.
2. Latchbolts: 3/4 inch throw stainless steel anti-friction type.
3. Lever Trim: Through-bolted, accessible design, cast lever or solid extruded bar type levers as scheduled. Filled hollow tube design unacceptable.
 - a. Spindles: Security design independent break-away. Breakage of outside lever does not allow access to inside lever's hubworks to gain wrongful entry.
4. Thumbturns: Accessible design not requiring pinching or twisting motions to operate.
5. Deadbolts: Stainless steel 1-inch throw.
6. Electric operation: Manufacturer-installed continuous duty solenoid.
7. Strikes: 16 gage curved steel, bronze or brass with 1 inch deep box construction, lips of sufficient length to clear trim and protect clothing.
8. Scheduled Lock Series and Design: As scheduled on Drawings
9. Certifications:
 - a. ANSI A156.13, 1994, Grade 1 Operational, Grade 1 Security.
 - b. ANSI/ASTM F476-84 Grade 31 UL Listed.

2.04 CLOSERS

- A. General:** One manufacturer for closer units throughout the Work. Door closer when provided then the sweep period of the closer shall be adjusted to so that from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3" from the latch, measured to the landing side of the door per CBC Section 1133B.2.5.1.
- B. Surface Closers:**
1. Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Double heat-treated pinion shaft, single piece forged piston, chrome-silicon steel spring.
 2. ISO 2000 certified. Units stamped with date-of-manufacture code.
 3. Independent lab-tested 10,000,000 cycles.
 4. Thru-bolts at wood doors unless doors are provided with closer blocking. Non-sized, non-handed, and adjustable. Place closer inside building, stairs, and rooms.
 5. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.
 6. Opening pressure: Exterior doors 5 lb., interior doors 5 lb., labeled fire doors shall not exceed 15 lb.
 7. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.
 8. Extra-duty arms (EDA) at exterior doors scheduled with parallel arm units.
 9. Exterior door closers: tested to 100 hours of ASTM B117 salt spray test, furnish data on request.
 10. Exterior doors do not require seasonal adjustments in temperatures from 120 degrees F to -30 degrees F, furnish data on request.
 11. Non-flaming fluid will not fuel door or floor covering fires.
 12. Pressure Relief Valves (PRV): unsafe, not permitted.

2.05 OTHER HARDWARE

- A. Kick Plates:** Four straight edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.
- B. Door Stops:** Provide stops to protect walls, casework or other hardware.
1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where floor type cannot be used, provide wall type. If neither can be used, provide overhead type.
- C. Seals:** Finished to match adjacent frame color. UL label applied to seals on rated doors. Substitute products: certify that the products equal or exceed specified material's thickness and durability. Proposed substitutions: submit for approval.

1. Non-corroding fasteners at in-swinging exterior doors.
2. Sound control openings: Use components tested as a system using nationally accepted standards by independent laboratories. Ensure that the door leafs have the necessary sealed-in-place STC ratings. Adhesive mounted components not acceptable. Fasten applies seals over bead of sealant.
3. Fire-rated Doors, Resilient Seals: UL10C/UBC-7-2 compliant. Coordinate with selected door manufacturers and selected frame manufacturer's requirements. Where rigid housed resilient seals are scheduled in this section and the selected door manufacturer only requires an adhesive mounted resilient seal, furnish rigid housed seal at minimum, or both the rigid housed seal and the adhesive applied seal if necessary to fulfill door manufacturer's requirement. Adhesive applied seal alone is deemed insufficient for this project where rigid housed seals are scheduled.
4. Fire-rated Doors, Intumescent Seals: Furnish fire-labeled opening assembly complete and in full compliance with UL10C/UBC-7-2. Furnished by selected door manufacturer, these seals vary in requirement by door type and door manufacture. Adhesive applied intumescent strips are not acceptable. Careful coordination required.

- D. Fasteners:** Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full-thread. Sleeve nuts: full length to prevent door compression.
- E. Silencers:** Interior hollow metal frames, 3 for single doors, 4 for pairs of doors. Omit where adhesive mounted seal occurs. Leave no unfilled/uncovered pre-punched silencer holes.

2.06 FINISH: Refer to drawings for schedule.

- A. Generally BHMA 626 Satin Chromium**
- B. Door closers:** factory powder coated to match other hardware, unless otherwise noted.
- C. Aluminum items:** match predominant adjacent material. Seals to coordinate with frame color.

2.07 KEYING REQUIREMENTS:

- A. **Key Systems:** Corbin-Russwin Lock Bodies is the City/Library Department Standard – No Substitutions
 - 1. Provide temporary I.C. core cylinders keyed to Construction Master.
- B. **Interchangeable Cores:** Utility patented, 6-pin solid brass construction.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. **Ensure that walls** and frames are square and plumb before hardware installation.
- B. **Locate hardware per SDI-100** and applicable building, fire, life-safety, accessibility, and security codes.
 - 1. Notify Architect of any code conflicts before ordering material.
 - 2. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

3.02 INSTALLATION

- A. **Install hardware per manufacturer's** instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation.
 - 1. Gaskets: Install jamb-applied gaskets before closers, overhead stops, rim strikes, etc. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.
- B. **Locate floor stops** not more than 4 inches from the wall.
- C. **Drill pilot holes** for fasteners in wood doors and/or frames.
- D. **Lubricate and adjust** hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for reuse.

3.03 ADJUSTING

- A. **Adjust and check for** proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.
 - 1. Hardware damaged by improper installation or adjustment methods to be repaired or replaced to Owner's satisfaction.
- B. **Inspection:** Use hardware supplier. Include suppliers with closeout documents.

C. Follow-up inspection: Installer to provide letter of agreement to Owner that approximately 6 months after substantial completion, installer will visit Project with representatives of the manufacturers of the locking devices and door closers to accomplish following:

1. Re-adjust hardware.
2. Evaluate maintenance procedures and recommend changes or additions, and instruct Owner's personnel.
3. Identify items that have deteriorated or failed.
4. Submit written report identifying problems and likely future problems.

3.04 DEMONSTRATION:

A. Demonstrate electrical, hardware systems, including adjustment and maintenance procedures.

3.05 PROTECTION/CLEANING:

A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.

B. Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

3.06 SCHEDULE OF FINISH HARDWARE

A. See door schedule in drawings for hardware set assignments.

END OF SECTION

SECTION 08800

GLASS AND GLAZING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide glass and glazing complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Window and door glass.
2. Mirrors.

1.02 QUALITY ASSURANCE:

A. Quality Standards: In addition to Code, glass installations shall comply with ANSI Z97.1, as applicable, and Federal Safety Standard 16 CFR 1201.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Samples and Product Data: Obtain color instructions from the Architect prior to submission. Submit the following:

1. Samples of various glasses to extent requested by Architect, 12" square with smooth edges.
2. Glazing channels with manufacturer's data covering materials and warranty.

B. Certificates: Submit from manufacturer stating the quality, thickness, and type of all unlabeled glass and glazing delivered to the site for field cutting.

C. Purchase Orders: Within 30 working days after execution of the Contract, submit evidence that firm purchase orders for all glass and glazing required for the Work have been placed with the glass suppliers.

1.04 JOB CONDITIONS: Protect glass and glazing until completion and final acceptance. Repair or replace damaged or defective glazing to the original specified condition, at no extra cost to Owner. Damaged or defective glazing includes glass that cannot be properly cleaned.

1.05 WARRANTY: Refer to Section 01740. Furnish a written warranty covering glass and glazing channels for 5 years against all defective material or deterioration including, without limitation, shrinkage causing loss of seal and exposure to sun, ozone, elements, smog and other air pollution, and commercial glass cleaners. Furnish a written warranty covering unframed mirrors against silver spoilage for 15 years.

PART 2 - PRODUCTS

- 2.01 **GLASS MATERIALS:** Refer to schedule on Drawings for types of glass and material selections from Domestic brand glass conforming to ASTM C1036 and ASTM C1048 for tempered, by PPG Industries, Inc., Glass Group, Libbey-Owens-Ford, Monsanto, St. Gobain, Spectrum, Viracon or equal. Factory cut glass lights shall be labeled and labels shall not be removed until directed. Job-cut glass, delivered unlabeled as "stock to cut", shall be accompanied by manufacturer's affidavit stating quality, thickness, type and manufacture; no such glass shall be cut until Architect's approval of material is obtained.
- A. **Plate Glass:** Clear as scheduled, glazing quality float, 1/4" thick unless otherwise shown or specified.
 - B. **Tempered Glass:** Furnish factory fully tempered glass. Handle and size glass in accordance with manufacturer's instructions. Furnish glass free of visible tong marks when installed. On each sheet, include an inconspicuous but visible label fused to the glass and placed in a lower corner, identifying the tempered glass. Provide fireman's tempered glass label if required by the local Fire Department. Furnish plate glass as indicated on Drawings.
 - C. **Insulating Glass Units:** Drawings and Specifications are based upon the use of insulating glass units conforming to the requirements herein, which establish intended types; refer to Section 01600 for substitutions.
 - 1. All insulated glazing shall be glazed at the factory. All glazing shall be (Low E) glazing constructed to an overall minimum thickness of 7/8" with two lites of DSB tempered glass (1/8") as size and loading requires. All insulated glass units shall be tested, certified and carry the required label reflecting level of testing passed an U Value of 0.28 along with all other requirement.
 - D. **Spandrel Glass:** PPG unless otherwise indicated on drawings, heat strengthened, free of discernible distortion, or equal, color to match glass with factory applied polyester opacifying film.
 - E. **Wire Glass:** Provide glass manufactured by Asahi Glass Company LTD, distributed by ACI Glass Products (213) 692-0395 polished "Misco" or "Baroque Style" 1/4", unless otherwise indicated, thick wire glass, pattern as selected by Architect, or Approved equal.
 - F. **Mirrors:** Clear or smoke where indicated, mirror quality float glass, Type I, Class 1, Quality q1 silvering and 1/4" thick unless otherwise indicated, edges ground and polished, double silvered, with electro-deposited copper backing and protective back paint coat equal to Palmer Products "Mirro-Bac Paint". Provide stainless steel frames on all edges unless otherwise shown or directed.

- G. **Glass Adhesive:** Standard product adhesive expressly manufactured for glass installation, equal to Palmer Products "Mirro-Mastic" with Mirro-Mastic Bond".

2.02 GLASS SETTING MATERIALS:

- A. **Glazing Channels:** Extruded neoprene or fibrous glass reinforced core vinyl type conforming to NAAMA SG-1-70, color as approved, with serrated channel legs for a tight seal to glass, meeting 5 year warranty requirements.
- B. **Blocks and Spacers:** Approved vinyl plastic or neoprene rubber type, nominal 50 to 90 Durometer except as recommended by glass manufacturer.
- C. **Glazing Sealant:** Tremco Mono One-Part Sealant, or equal, approved colors.

PART 3 - EXECUTION

3.01 GLAZING: Employ skilled and experienced glazers. Set glass air-tight and true with glazing channels. Perform glazing according to the "Glazing Manual" of the Flat Glass Jobbers Association and with PPG Technical Service Report #104 except as required herein. Install glass in metal frames according to manufacturer's instructions to obtain weatherproof and waterproof installations. Conform glass edge bearings, clearance, and edge laps to Code. Use glazing channels specified herein unless channels are furnished by manufacturers under other Sections.

- A. **Glass Fastenings:** Set glass in rabbets with glazing blocks and spacers so glass does not contact frame. Set glass to preclude looseness and rattling.
- B. **Glazing Channels:** Compress channels at least 5% lengthwise during installation, and at least 15% by stops. Produce air and water tight installations.

3.02 MIRRORS: Clean backing of paint and other deleterious materials, then prime with bond coat. Embed all mirrors in a continuous contact of glass adhesive. Provide top and bottom edge channels and corner guards of stainless steel or aluminum where indicated or directed.

3.03 COMPLETION: Do not use harsh cleaning agents, caustics, acids, or abrasives for cleaning. Wash and polish glass both sides and leave free of dirt, streaks, and labels.

END OF SECTION

SECTION 08900

WINDOW WALL, STOREFRONT AND ENTRANCES

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide window walls, windows, storefronts and entrances as indicated, specified, and required. This is a performance specification and is issued in conjunction with the contract drawings which indicate the general arrangement of the work, dimensions, structural system and the major architectural elements of construction. As performance documents, the drawings and specification do not necessarily indicate or describe all items required for the full performance and completion of the work. The work under this Section includes labor, materials, equipment and services all as required for the complete fabrication, assembly, delivery, anchorage, erection and weatherproofing of the window wall and its related items as detailed on the Architect's drawings, as herein specified and as required by job conditions.

A. Work In This Section: Principal items include, but are not necessarily limited to:

1. Design of the components connections and system.
2. Submittals, Building Department approvals and permits.
3. Aluminum window walls, entrances and aluminum storefront.
4. Glass and glazing.
5. Aluminum infill panels.
6. Stile and glass entrance doors.
7. Finish on all window wall components.
8. Closures and sleeves.
9. Flashing as related to the window wall.
10. Calking and sealing of the window wall.
11. Installation of entrance door hardware furnished under Section 08710.
12. Drywall adapters and blind pockets.

B. Related Work Not Included In This Section:

1. Furnishing finish hardware for all entrance doors specified in Section 08710.
2. Drywall and/or plaster support framing at exterior wall specified in Section(s) 06100 and 09100.
3. Gypsum wallboard specified in Section 09250.

1.02 CONTRACTOR'S RESPONSIBILITIES:

A. Prior to submission of a bid, examine and study the drawings and specifications with regard to adjacent surfaces and structural framing to which the Work of this Section is attached and anchored and submit written notification to the Architect

noting deficiencies or discrepancies that would affect the proper or timely installation of any Work in this Section.

B. Coordinate the following items with General Contractor and applicable Sub-contractors of related Work.

1. Coordinate and verify, by measurement at the job site, dimensions affecting his Work. Submit written notification to the General Contractor documenting field dimensions and conditions which are at variance with those on the approved Shop Drawings, Contract Documents, or are detrimental to the proper and timely installation of job site materials. Decisions regarding corrective measures shall be obtained from the General Contractor and reviewed by the Architect prior to the fabrication of the items affected. Contractor shall insure the compatibility of adjacent items and materials that relate to his Work.

1.03 DESIGN RESPONSIBILITY: This is a performance specification and all criteria for the solution of a watertight and structurally sound window wall, windows, storefront and entrance system(s) as detailed on the drawings are both center and offset system(s) and herein specified is for the sole purpose of defining the design intent and performance requirements. The details shown are intended to emphasize the preferred profiles and performance requirements for this project. The Contractor is hereby advised that the responsibility for the window wall is totally his and that all designs and resolutions proposed in the Contractor's Shop Drawings, structural calculations and related documentation and certification must be demonstrated not only in laboratory Mock-up tests, and the special guarantee periods as herein specified, but field water leakage test procedures, as approved by the Architect.

- A. Adjustments:** Thickness of metal, dimension and profile adjustments shall be made in the proposed system to facilitate fabrication or erection methods or techniques, the weatherability factor, or the design and performance requirements. The design is limited only to the dimensional space allowed for the window wall/curtain wall and entrances as indicated by the capacity of the system to meet or exceed the design and performance requirements specified herein.
- B. Proposal Submission:** Design proposal submissions which follow exactly the detail indicated on the drawings will not relieve the Contractor of responsibility for the design, fabrication, erection, or performance of work included in this Section.
- C. Right To Reject:** The Architect will have the right to reject components and assemblies during assembly and erection if the workmanship and intent are not in strict accord with the approved Shop Drawings, structural calculations, documentation, certifications, Samples, mock-up test, and as herein specified.
- D. Changes:** Document changes to the Architect's Drawings and Specifications in writing for architectural review. Design proposal must equal or better the design,

function and material standards as described on the Architect's Drawings and herein specified. In the event of a controversy over the design, the decision of the Architect will take precedence.

- E. Supplementary Parts:** Provide and install all supplementary parts necessary to complete the work as described on the Drawings and herein specified, though not definitely shown or specified. Unless otherwise noted or specified to be furnished or installed by another Subcontractor, this work shall include type and thickness and temper of all glass, the design and sizing of all wall sections and anchor assemblies to meet the performance, and design requirements, and the furnishing of inserts to be installed by others, fasteners, clips, bracing, and steel framework as required, even if not shown, for the proper anchorage of the window wall/curtain wall, entrances and cladding elements to the structure.
- F. Review of Submittals:** Architect's review of all submittals as designed in this Section will be issued only with the understanding and assurance that the Window Wall Contractor is fully responsible for the performance of all work included within the scope of this Section. The Contractor's submittals and proposals will be understood and assumed to be the most appropriate and best suited for their intended use and, in fact, as recommended for the specific use or uses, including assurance that the Owner can receive the optimum life expectancy for all materials.
- G. Systems:** Window wall, windows, storefront areas and entrances are Systems as detailed on the Drawings are to be designed to accommodate the performance requirements herein specified, including, but not limited to, the accommodation of shear stresses and movement in sealant joints and the opening of joinery during dynamic movements. All metal joinery within, adjacent to and common to the window wall, curtain wall and entrance systems must maintain structural, weathering and watertight integrity as defined in the performance criteria.

1.04 **PERFORMANCE REQUIREMENTS:** All components, assemblies and completed work included in and pertinent to the work of this Section shall conform to the following minimum performance standards and comply with applicable sections of the 2007 LACBC and California Building Code (CBC) 2007 California Title 24, Division 4, Section 4.1.6. Air leakage requirements of Division 4. Except when applicable codes make other provisions, or as otherwise noted herein, all loads shall act in combinations that provide the most unfavorable conditions. Wind loading need not be considered as additive to seismic loading. The performance requirements shall include, but not necessarily be limited to, the following items:

- A. Thermal Movement:** Provide and/or make allowances for free and noiseless vertical and horizontal thermal movement due to the contraction and expansion of component parts, for an external surface metal temperature range of from plus 20 degrees F. to plus 180 degrees F. Buckling, opening of joints, glass breakage, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement of component parts will not be permitted. Fabrication,

assembly and erection procedure can take into account the ambient temperature range at the time of the respective operation.

- B. Air Infiltration:** Air infiltration shall be tested in accordance with ASTM E283. Infiltration shall not exceed .06 cfm per square foot (.0003 M³/5M²) of fixed area at 6.24 psf. Water infiltration shall be tested in accordance with ASTM E331 and in accordance with AAMA standard TM-1-76.
- C. Water Penetration and Moisture Control:** Water infiltration shall be tested in accordance with ASTM E331. No water penetration at a test pressure of 8 psf. The systems shall preform to these criteria under a combined load and acting perpendicular to the glass plane as referred to in this Section. It is the responsibility of the Contractor to design, furnish and install a totally watertight window wall, windows, storefront, entrances and cladding assemblies.
- D. Water Penetration** in this Section is defined as the appearance of water, other than condensation, on the roomside of any part of the assembly offering protection from the exterior elements to the interior building space which cannot be drained to the exterior. Other definitions are superceded by this definition.
- E. Provision** shall be made to drain to the exterior of the wall any water entering at joints or glazing reveals and any condensation occurring within unit. Weep slots shall be baffled or staggered.
- F. Wind Loads:** Conform to 2007 LACBC and CBC 2007
- G. Seismic Forces:** Conform to 2007 LACBC and CBC 2007

1.05 BUILDING DYNAMICS:

- A. Building Dynamics** are defined as any building movement or deflection caused by the singular or combined effects of wind, or seismic, thermal, live, impact and/or concentrated loads, including the kinetic deflections resulting from the dead load of materials, and live load of personnel and equipment. The design, fabrication, assembly and installation of the window wall, windows, entrances and cladding assemblies herein specified shall accommodate all inherent building dynamics, including the fabrication, assembly and installation tolerances of related work not included in this Section, without the loss of, or any detrimental effect to, the performance requirements herein specified. The Contractor shall verify and accommodate such movements, deflections and tolerances.
- B. Window Wall Components and Systems** shall accommodate a live load floor deflection of not less than plus or minus 3/8 inch. This is in addition to any erection, fabrication and thermal expansion deflections which shall be accommodated. Live load deflection shall be assumed to occur on individual floors but not on all floors simultaneously.

- C. Structural Design Loads:** The allowable stresses for aluminum window wall/curtain wall elements shall conform to the minimum standards as published in the Aluminum Association's "Aluminum Construction Manual - Specification for Aluminum Structures", Current Edition", and other applicable codes or regulations. The minimum design loads herein specified shall comply with the 2007 LACBC and California Building Code (CBC) 2007 Edition, and other applicable building codes and regulations.
- D. Anchorage and Structural Support Framing:** Unless otherwise noted on the Drawings, all anchor assemblies and components, and support framing, including related connections and/or fasteners for window wall/entrance assemblies shall be designed, furnished and/or installed as required for full compliance with the specified performance criteria. All such items indicated and/or noted on the Drawings are schematic and do not necessarily indicate the exact and/or required scope, type, shape, or profile. Embedded anchors shown at slab edges are required as indicated schematically. Structural design does not allow drilling or "shooting" of any anchors near slab edges. Additional anchorage and structural support framing shall be added, or complemented as required. Anchorage and structural supports shall not spall or weaken the integrity of the structural support system. All structural steel to be primed. Repair prime coating after weldments.
- E. Point of Support** for the assemblies shall be properly braced in the three orthogonal directions (vertical, transverse and longitudinal) to resist loads from all directions, including but not necessarily limited to, the positive and negative wind pressures, and seismic forces.
- F. Anchorage and Support Framing** shall be designed to accommodate wind load, thermal, seismic and building movements without any harmful effect to the assemblies as herein specified, including glass and glazing and sealant applications. All anchorage clips, bolts, etc. to be designed for code stresses and no less than maximum wind loads x 1.5.
- G. Coordination with Concrete Trade:** Furnish Contractor with a dimensioned placement drawing showing location of embedded anchors. Verify correct placement of anchors before and after concrete is placed.
- H. Glass Performance:** The maximum overall size, minimum thickness and type of glass shall conform to the applicable glass manufacturer's recommendation for the openings or sizes indicated on the Drawings and the performance requirements as herein specified. Glass shall also conform to governing codes and regulations. Glass shall be designed to perform to a specified safety factor of 2.5 and sustain at maximum wind loading at a statistical glass breakage of no more than 8 lights per 1000 lights. Provide heat strengthening or tempering where conditions of thermal breakage may occur. Glass manufacture shall provide certification of glass use, including the review of thermal stresses due to shading, etc.

- I. Reference Standards:** Published specifications, standards, tests or recommended methods of trade, industry or governmental organizations apply to work of this Section where cited by abbreviations noted below or in Division 1.

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturer's Association
AIA	American Institute of Architects
AISI	American Iron and Steel Institute
CSI	Construction Specifications
FGJI	Flat Glass Jobbers Institute
GMA	Glass Manufacturers' Association
ICBO	International Conference of Building Officials
NAAMM	National Association of Architectural Metal Manufacturers
OSHA	Occupational Safety and Health Association
RMA	Rubber Manufacturers' Association
SSPC	Structural Steel Painting Council
LACBC	Los Angeles County Building Code
CBC	California Building Code

1.06 SUBMITTALS: Refer to Section 01300 for procedures.

- A. Preliminary Design Proposals and Calculation:** Within forty five (45) calendar days of the date of receipt of letter of intent of this Contract, the Contractor shall submit to Architect for his review, structural calculations stamped by a California Structural Engineer and a detailed design proposal of the typical window wall areas for review of the basic wall concept. The detail design proposal shall include drawings of the framing members, glass and other components. The Wall Contractor shall not proceed with Shop Drawings until the detail design proposal are reviewed and deemed in accordance with the Contract Documents. Upon receipt of the Architect's review and comments on the detail design proposal, the Contractor shall make any required adjustments to the design and proceed to prepare Shop Drawings for submittal.
- B. Shop Drawings:** Shop Drawings for window wall and entrances shall be submitted to the Architect for his review in accordance with General Conditions of the Contract and Division 1 of these specifications. Architect's review shall be for conformance to the design concept and for general arrangement only, and such review shall not relieve the Contractor of any of the responsibilities as stated herein or any other applicable items herein specified. Shop Drawings shall not be prepared or submitted until design proposal has been reviewed by the Architect. No Work shall be fabricated until Shop Drawings, structural calculations, stamped by a California Structural Engineer and all other related submittals, documentation, and samples have been reviewed by the Architect. No Work shall be installed until all required certifications have been review by the Architect.

- C. Incorporation:** Shop Drawings shall incorporate plans, elevations, sections referenced to Architect detail numbers, and full size details for all work of this Section. The full size details shall show and specify all metal and glass thicknesses, types and finishes; areas to be sealed and sealant materials; gaskets; direction and magnitude of thermal expansion; direction and magnitude of all applicable building and seismic movements; type and size of construction including joinery, fasteners and welds. Internal joinery shall be shown in isometric drawings for clarity. All anchorage assemblies and components; the fabrication and erection tolerances for the work of this Section and the adjoining related work and the layout of all inserts and reglets shall be shown. The Shop Drawings shall also indicate full size details of adjoining work even though not included in the work of this Section, to insure proper installation and coordination of the work and the work of other Contractors.
- D. Schedules:** In Addition to the above requirements and in order to coordinate the glass and sealant certification also required to be submitted, provide the following schedules with Shop Drawings submission.
- E. Materials Certification:** Certification that the following materials and/or processes meet or exceed the specified performance requirements shall also be submitted by the Contractor with the Shop Drawings.
1. Aluminum alloys and finishes.
 2. Steel alloys and finishes.
 3. Sealants.
 4. Neoprene gaskets, nylon, etc.
 5. Fasteners and weldments.
 6. Glass.
 7. Compatibility of materials, finishes, methods of application.
 8. Organic Paint finishes.
- F. Prints:** Three copies of the Shop Drawings shall be submitted to the Architect for review. Architect will review the Shop Drawings to insure their conformance to the Contract Documents. Architectural review of Shop Drawings shall not relieve the Contractor from any of the responsibilities and requirements as herein specified. No work shall be fabricated until the Shop Drawings, structural calculations, documentation, certifications, Samples and mockup tests have been reviewed by the Architect.
- G. Structural Calculations:** Four copies each of the structural calculations shall be submitted to the Architect for his review. Architect shall review the structural calculations to insure their conformance to the Contract Documents. Architectural approval of structural calculations will not relieve the Contractor from any of the responsibilities and requirements as herein specified. Structural calculations shall be prepared and certified by a civil or structural engineer registered in the State of California. Structural Calculations shall include, but not

be limited to, computations for the justification of all window wall, curtain wall, entrance, framing elements and/or sections, connection, including fasteners and welds, anchorage assemblies, etc., in static and dynamic modes. Structural Calculations shall be cross-referenced to the applicable Shop Drawing details and the engineer responsible for the calculations shall sign the Shop Drawings after his review. Provide a complete structural analysis of seismic movement showing the resultant effect and/or forces on all applicable structural components including, but not limited to, anchor, welds, fasteners, etc. Anchor clips with slotted holes shall be calculated in the most extended condition. Structural calculations shall dimensionally limit the stacking of shims in regards to bending on bolts, clips, etc.

- H. Requirements of Regulatory Agency:** Contractor shall submit the Shop Drawings and structural design calculations to the governing Building Department for plan check and building permit. Any additional charges or permit fees will be paid for by the Owner. Modification required by Building Department shall be reviewed with the Architect for architectural conformance with aesthetic design shown on the Drawings before the documents are revised and the permit secured.
- I. Glass and Glazing Documentation:** The Wall Contractor shall submit a detailed diagram to the product manufacturer indicating how their product will be used in the various window wall systems. Along with the Diagram, include written information describing application and/or installation techniques, wind load, wall and building movement, magnitude of thermal expansion, blocking, sealing, surface preparation and any other procedures, operations, or exposures which may affect the performance of the manufacturer's wall product. The Product Manufacturer shall review and approve the Wall Contractor's submission for responsible use of their material relative to the specific application based on the information supplied by the Wall Contractor, noting on the submission all procedures or conditions they believe will not allow their product to perform, including thermal stresses and gradient caused by shading, or any other source. The Returned Review and approval by the product manufacturer of the wall manufacturer's submitted diagram will be acceptable documentation to satisfy this requirement. The Review of the Wall Contractor's submission by the product manufacturer does not in any way relieve the Wall Contractor of responsibility for the performance of this wall system, nor is he to assume that the product manufacturer's review is a guarantee of performance. The product manufacturer would be responsible only for the quality of the product and the degree that he presents the properties of this product as adequate to perform.
- J. Record Shop Drawings:** At the completion of the job submit one set of record Shop Drawing sepia depicting the window wall, windows and storefront, system as installed. Clearly indicate all deviations and changes to the final approved Shop Drawings, including any changes in anchors or attachments due to variations with construction tolerances.

PART 2 - PRODUCTS

2.01 MATERIALS: U.S. Aluminum or Arcadia Series system, Alloys, tempers, thicknesses and/or gauges shall be as required for performance and finish. System as shown on the drawings is for window wall and storefront entrance system. The glass assembly systems are glass system as specified in Section 08800 or indicated on Drawings.

A. Steel:

1. Hot rolled shapes and plates ASTM A36.
2. Tubing: ASTM A500 or A501.
3. Non-tubular cold-formed carbon steel with thickness 0.168 in. or less: ASTM A446.

B. Aluminum:

1. Extrusions: Alloy and temper for aluminum extrusions shall be 6063-T5 or T6. Provide thickness as required for structural integrity of the system. Standard commercial tolerances as listed in Aluminum Standards and Data shall apply to finished, fabricated and assembled materials. Stricter tolerances shall apply where required to assure proper functioning of glass and glazing materials.
2. Sheet: Alloy for aluminum sheet which is exposed shall be 5005. Sheet which is not exposed may be 3003 alloy. All sections shall be formed true to detail and free from defects impairing appearance, strength or durability. Minimum thickness 0.125". Standard commercial tolerances as listed in Aluminum Standards and Data shall apply to finished, fabricated and assembled materials.
3. Miscellaneous Materials:
 - a. Fasteners: Type, size, alloy quantity and spacing of all fasteners and anchorage devices shall be as required for performance. Where exposed, fasteners shall be aluminum or 300 series nonmagnetic stainless steel. Where not exposed, fasteners may be zinc-plated steel in accordance with ASTM A165-55 and A164-55. Provide lock washers on bolts into concrete inserts. Provide lock nuts at all other bolted connections.
 - 1). Fastening Devices between aluminum and aluminum shall be AISC Type 305 (18-8) stainless steel.
 - b. Hot-rolled Shapes: Hot-rolled shapes and plate shall satisfy requirements of ASTM A36. Cold-formed steel shall conform to one of the material specifications listed in the Specification for the Design of Cold-Formed Steel Structural Members.
 - c. Inserts for Anchorage in Concrete: Furnish type and size as called for on architectural drawings. Reinforcing rod attachments to be as required by structural calculations. Welding and painting shall be as required under steel-deck concrete embedment specifications.
 - d. Shims, Spacers and Washers: Provide slip pads and separators of nylon, high-impact polystyrene or approved equal, between

moving parts at all expansion connections. Steel washers shall be zinc-plated. U-shaped shims or washers shall not be permitted at dynamic connections or where they could become loose. Do not use plastic shims at structural connections. A maximum of 1/4" thickness and a maximum of two shims will be permitted at bolted connections.

2.03 ALUMINUM FINISH

- A. Aluminum Sheet and Extrusion Surfaces:** Provide a Clear Anodized Factory Finish on surfaces of aluminum components in accordance with AAMA Factory Finish Standards. Refer to schedules on drawings for selections of finishes.
1. Aluminum components shall be finished in accordance with the designations and proprietary identifications set forth in the schedule on the drawings.
 2. Designations refer to the finishes defined in The Aluminum Association Designation System for Aluminum Finishes, DAF-45.
- B. Steel:** Galvanized or zinc prime coatings or as noted on the Drawings. Repair coating after welding.
- C. Finishing Operations:** All components shall be fully formed and fabricated prior to finishing. All exposed surfaces shall receive the specified finish with no mill finish aluminum exposed. Sealants may not be applied to mill finish aluminum unless accepted and warranted by sealant manufacturer. Do not commence finishing operations until all forming and fabrication operations have been completed.
- D. Protecting:** Extreme care shall be exercised to protect finishes during manufacture and installation. Damaged elements will be rejected by the Architect. Touch-up procedures which do not meet the finish requirements specified shall be permitted without the written permission of the Architect.

- 2.04 GLASS: Refer to drawings for schedule of types of glass. Glass shall meet requirements Domestic brand conforming to ASTM C1036 and ASTM C1048 for tempered, by Pilkington, Libbey-Owens-Ford, Viracon or equal. Substitutions will be considered. Glass and mirrors shall be factory labeled on each pane and labels shall not be removed until final acceptance is obtained. All tempered and heat-strengthened glass shall be processed in the horizontal position to eliminate tong marks. The maximum overall size, minimum thickness and type of glass shall conform to the applicable glass manufacturer's recommendations for the openings or sizes indicated on the drawings and the performance requirements as herein specified. Glass shall also conform to governing codes and regulations. Glass shall be designed to perform to a specified safety factor of 2.5 and sustain at maximum wind load a statistical glass breakage of no more than 8 lights per 1000 lights. All glazing and glazing materials shall conform to requirements set for in the GANA Field Glazing Manual

- A. **Plate Glass:** Provide glass as scheduled on Drawings, glazing quality float, 1/4" thick unless otherwise shown or specified. All single glass units shall be tested, certified and carry the required label level of testing passed an U Value of 0.510 along with all other requirement.
 - B. **Tinted Glass:** Provide tinted glass as scheduled on Drawings, 1/4" thick unless otherwise indicated or specified. All single glass units shall be tested, certified and carry the required label level of testing passed an U Value of 0.510 along with all other requirement.
 - C. **Tempered Glass:** Furnish factory fully tempered glass. Handle and size glass in accordance with manufacturer's instructions. Furnish glass free of visible tong marks when installed. On each sheet, include an inconspicuous but visible label fused to the glass and placed in a lower corner, identifying the tempered glass. Provide fireman's tempered glass label if required by the local Fire Department. Furnish plate glass as scheduled on Drawings or indicated or required. All single glass units shall be tested, certified and carry the required label level of testing passed an U Value of 0.510 along with all other requirement.
 - D. **Insulating Glass Units:** Drawings and Specifications are based upon the use of insulating glass units conforming to the requirements herein, which establish intended types; refer to Section 01600 for substitutions.
 - 1. All insulated glazing shall be glazed at the factory. All glazing shall be (Low E) glazing constructed to an overall minimum thickness of 7/8" with two lites of DSB tempered glass (1/8") as size and loading requires. All insulated glass units shall be tested, certified and carry the required label reflecting level of testing passed an U Value of 0.28 along with all other requirement.
 - E. **Spandrel Glass:** PPG unless otherwise indicated on drawings, heat strengthened, free of discernible distortion, or equal, color to match glass with factory applied polyester opacifying film.
- 2.05 **DOORS FABRICATION:** For entrance doors, the door stile and the rail face dimension of the Arcadia Entrances will be as detailed on Drawings
- A. **Aluminum Entrance Doors:** Stile as detailed on drawings or as selected by Architect stile type with 10" bottom stile and water repellent treated mohair weatherstripping in aluminum retainers at all four edges. Aluminum finish to be finished as specified herein.
- 2.06 **FLASHINGS:** Gauge and overall dimensions shall be as shown on the Drawings. Flush butted joints with back-up plates to be used typically. Provide minimum 12" lap at flashing joinery with fasteners as required. Lapped surfaces of flashing to be joined in full bed of sealant. Mechanical fasteners to be used at flashing joints where required to maintain bond. Flashings to be furnished to match where exposed.

2.07 SHOP AND FIELD SEALANTS:

- A. For Structural Glazing** acceptable sealants are G.E. 1200 silicone, Dow Corning 795 silicon, or Pecosa “850” silicone.
- B. For Sealing** between window wall, curtain wall and adjacent work, acceptable sealants are silicones as manufactured by Dow Corning, G.E., or Pecosa. Select an appropriate sealant for joint size, movement, and substrates.
- C. General Sealant Requirements:** Locate and identify all sealants by product name on shop drawings. In using specified sealants or approved alternates, strictly observe the printed instructions of the sealant manufacturer regarding joint size limitations, mixing, priming and application. Where printed instructions are indefinite on the use of a primer, a primer shall be used. Unless printed instructions advise to the contrary, do not apply sealants when substrates are wet or when the temperature is below 40°F.
- D. Color For Sealant** to be selected by Architect and not to be limited to standard colors.

2.08 NEOPRENE GLAZING GASKETS AND AIR SEALS: Glass and glazing materials and requirements are subject to a final review by the Architect. Substitutions in the interest of the performance, function, compatibility of materials, and safety may be proposed for architectural review. All proposals must be properly and adequately documented. Neoprene glass and glazing materials, including but not necessarily limited to, extruded glazing gaskets, glass setting blocks, jamb shims, bushings, tapes, separators, joint fillers and sealant backup gaskets shall be high quality ozone resistant, cured elastomeric virgin neoprene compounds conforming to the following specification standards:

- 1. Dense (Solid Neoprene): AAMA Standard SG-1-76 with molded corners.
 - 2. Closed Cellular (Sponge) Neoprene: ASTM C509 with molded corners.
- A. Material Certification** for neoprene shall be as required to substantiate compliance with AAMA Standard SG-1-76 and ASTM C509 standard as applicable.
 - B. Glazing Gaskets** shall be extruded with continuous integral locking projections to engage into the metal glass holding member, be designed to be in contact, at all times, with adjacent elements during dynamic loading, building and thermal movements and provide a watertight seal as required to meet the performance criteria.
 - C. Roll-in Glazing and Back-Up Gaskets:** Shall be sized in lengths or units to provide for a minimum crowd-in of 1% to 2%, or as otherwise recommended

by the manufacturer, to insure against any pull-back at the corners. Roll-in Glazing and backup gaskets for any one light or glazed opening shall be continuous one-piece units with factory fabricated injection molded corners free of all flashing and burrs.

- D. Materials:** Recommendations and Details describing the proposed use, design and application procedures for neoprene glass and glazing materials shall be documented and fully described on the Shop Drawings.
- E. Setting Blocks and Edge Blocks:** Setting blocks used to support the glass shall be EPDM or neoprene and of between 80 and 90 Shore A Durometer hardness. Edge blocks used for centering the glass and preventing lateral walking shall be neoprene or EPDM and of between 60 and 70 Shore A Durometer hardness. Blocks shall be of a size and placed as recommended by FGMA Glazing Manual.

2.09 PANEL (INFILL) MATERIAL:

A. Alucobond® Composite Material

1. Size of panels shall be as indicated on drawings as to which opening shall received this infill panel.
2. Composite: Two sheets of aluminum sandwiching a core of extruded thermoplastic, formed in a continuous process with no glues or adhesives between dissimilar materials. Total composite thickness is 4mm.
3. Face Sheets: 0.020" thick aluminum (alloy to be 3003 for coil-coated sheet or 5005 for anodized).
4. Color and Coating: Provide color as scheduled or as selected by Architect.

PART 3 - EXECUTION

- 3.01 PROTECTION AND CLEANING: Debris caused by or incidental to the installation work will be promptly removed from the job site as the work progresses. Weep holes and drainage channels shall be unobstructed and free of dirt, rubbish and sealants. Upon completion of the work, remove protective coverings from exposed surfaces, and clean surfaces free of all soil and discoloration. Cleaning shall be in accordance with the provisions of the listed References and Standards and the requirements of the applicable manufacturers of materials. Cleaners shall be acceptable to the aluminum, glass, sealant, gasket and aluminum finishing manufacturers. Where doubt exists, make spot tests. Initial cleaning shall be the responsibility of the Contractor. When installation is complete, responsibility for final cleaning and protection shall pass to the General Contractor for the entire project. The General Contractor shall do all final cleaning. However, this Contractor or his Glass and Glazing Subcontractor shall initially clean all glass, remove excess sealant, tape etc. The General Contractor shall employ experienced workmen for final cleaning of glass. Methods of cleaning shall be provided by the Contractor. The cleaning procedure shall be monitored by the Contractor who has the responsibility to insure that no deleterious occurrences develop

which shall void his contractual responsibilities. Where work is to be installed within or adjacent to concrete, no window wall components other than built-in anchor devices shall be put in place until the concrete work is completed, including the removal of all forms, shoring, etc.

- 3.02 ANCHORAGE: Anchorage of the wall to the structure shall be by approved methods and in strict accordance with the approved Shop Drawings. After the window wall, curtain wall and entrances components are properly positioned all connections so designated on approved Shop Drawings shall be rigidly fixed by welding or other positive means. Anchorage assemblies and their related components shall be thoroughly scheduled and described on the Shop Drawings so that an installation can be evaluated to insure responsibility for furnishing and installing materials according to the Shop Drawings. Descriptive items shall include the movement and tolerances of related building and wall components including the direction and magnitude of thermal, building and seismic movements; materials, sizes, quantities and any special instructions as may be required. All primary window wall/curtain wall anchorage assemblies (attachment of window wall/curtain wall and related items to the building structure) shall receive 100 percent inspection by a licensed Deputy Inspector, the cost of which shall be borne by the Owner.
- 3.03 GLASS BREAKAGE DURING CONSTRUCTION: Glass breakage caused by the Contractor in executing his work or caused by the installation of faulty work by him shall be replaced by the Contractor at his own expense. Glass breakage caused by other Subcontractors because of negligence or any other reasons shall be replaced at the expense of the applicable Subcontractor at fault or the General Contractor. Broken glass shall be replaced within 5 calendar days. Openings caused by breakage shall be protected immediately.
- 3.04 ERECTION TOLERANCES: The window wall, curtain wall and entrances components shall be erected plumb and true in proper alignment and relation to established lines and grades, as shown on approved Shop Drawings. The installed window wall, curtain wall components shall conform to the erection tolerances.
- 3.05 GLAZING: Before the shop or field preglazing of the window wall units, openings shall be checked to see that they are square, plumb and in true plane. If found otherwise, glazing will not proceed until proper corrections are made. No tempered or heat-strengthened glass shall be cut after leaving the factory. Perimeter clearance must be sufficient to avoid point loading and provide for jamb and seismic blocking. Furnish detailed instructions for the installation of glass. Instructions and explanatory details shall include sequence of installation, method of installation for all materials (including the glass, glazing, setting blocks, jamb blocks, etc.) location of specific items such as the setting blocks and jamb blocks and any special instructions as may be required. Particular attention should be directed to the maintenance of the proper edge distance of bits on edges and the elimination of glass. Supply the following spare lights to the job site as part of this Contract: 4 each of each size of tempered or heat strengthened glass (excluding corners, doors and side lights).

3.06 **PRODUCT DELIVERY, STORAGE AND HANDLING:** All materials delivered to the site shall be stored in spaces provided by the General Contractor. Materials shall not be exposed to wetting or damage and shall be stored neatly, properly stacked on dunnage. Assembled units and/or their component parts shall be transported, handled and stored in a manner to preclude damage of any nature. Accessory materials required for erection at the site shall be delivered to the site in manufacturer's labeled containers. Remove units or components which are cracked, bent, chipped, scratched or otherwise unsuitable for installation and replace with new.

3.07 **FIELD QUALITY CONTROL**

- A. **Method for field check** for water leakage, but not interpretation of results, shall conform to AAMA 501.2-83 and/or modified ASTM E 1105, except as modified herein.
- B. **Periodically test sealant** in place for adhesion, using methods recommended by sealant manufacturer. Promptly replace any sealant, which does not adhere or fails to cure.
- C. **Perform peel test on** at least 5% of glass openings with field applied structural silicone. Record date, locations and results. Submit records for information only. Replace silicone which fails tests.

3.08 **WARRANTY:**

- A. **General:** All work included in the Section shall be fully guaranteed for performance, materials and workmanship for a period of not less than (5) Five Years from the date of beneficial occupancy (as certified by the Architect) unless otherwise noted herein. Guarantees and warranties shall be delivered to the Owner in duplicate, in an acceptable form, executed by an authorized officer or manufacturer of each material and shall be dated and notarized by a duly authorized Notary Public. Any failure in any of the window wall components shall result in an extension of the guarantee period until the deficiency is permanently repaired.
- B. **Aluminum With Factory Finish:** Guarantee for at least (10) Ten Years that finish shall not develop excessive fading or non-uniformity of color, shall not crack or peel and shall not pit or corrode within following requirements:
- C. **Sealants:** Provide a written statement in approved form guaranteeing that sealed joints shall remain watertight for a period of (20) Twenty Years. Guarantee shall further state that installed sealants are guaranteed against the following:
 - 1. Adhesive or cohesive failure of joints.
 - 2. Surface degradation or crazing greater than 3 mils in depth developing on surface of material.

3. Staining of surfaces adjacent to joints by sealant or primer by migration through building materials in contact with them.
4. Chalking or visible color change on surface of the cured sealant materials.
5. Shore "A" durometer hardness to the extent stated in the manufacturer's published literature.
6. Increase or decrease of Shore "A" durometer hardness (5 second reading) of sealant of more than 30% of value of 7-day value of Shore "A" durometer hardness of sealant.

Include guarantee provision agreement to repair and replace, at the Contractor's expense, sealant defects which develop during guarantee period. Guarantee shall include all labor and materials required to repair and replace faulty sealants.

- D. Glass:** Guarantee to remove and replace at the Contractor's expense, any and all glass lights that fail to meet the design and performance requirements. This replacement guarantee shall include all labor and materials required to remove and replace the faulty glass and installation.
- E. Defective Work:** Defective work shall be removed and replaced, at the expense of the Wall Contractor. Include in (5) Five Year guarantee period the provision to repair and replace, at the Contractor's expense, glass lights that fail in concentrated or massive quantities, or isolated glass breakage proven defective in manufacture or installation. Other isolated cases will be replaced at the expense of others, pending determination of cause. This special replacement guarantee shall include all labor and materials.
- F. Form of Warranty:** Guarantees and warranties shall be delivered to the Architect in duplicate, in an acceptable form, executed by an authorized officer of manufacturer of each material and shall be dated and notarized by a duly authorized Notary Public.
- G. Warranty Extension:** Any failure in any of the window wall components shall result in an extension of the guarantee period until the deficiency is permanently repaired.
- H. Corrections of Defective Work:** Should any work under this Contract be found defective in materials or workmanship, it shall be corrected in accordance with the following provisions: If, within Five (5) years after the date of substantial completion or within such longer periods of time as may be prescribed by laws or by the terms of any of the work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner. The Owner shall give such notice promptly after discovery of the condition. If exploratory work is required to determine the cause of the defects, the cost of this work shall be borne by the Contractor. The Contractor shall be responsible for continuing

corrections of defective work beyond the guarantee period if initial corrective measures were executed per the requirements as noted above but later found to be inadequate or not acceptable after the specified period.

- 3.08 MANUALS: Submit three (3) copies of detailed procedures for the periodic inspection, maintenance and cleaning of all applicable elements, including glass and finishes at completion of this Contract and when requested by the General Contractor.

END OF SECTION

SECTION 09100

METAL SUPPORT SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide metal support systems complete metal support systems as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Metal stud framing and furring for plaster walls and ceilings.
2. Metal framing for gypsum wallboard walls and ceilings.
3. Metal backing plates for securing materials of other trades.
4. Installation of access panels on metal framing as furnished by other trades.

B. Related Work Not In This Section:

1. Lath and plaster.
2. Gypsum wallboard.
3. Hanger wires and framing for suspended grid acoustical ceilings.
4. Thermal and sound insulation.
5. Furnishing access panels for mechanical and electrical trades.
6. Firestopping.

1.02 QUALITY ASSURANCE:

- A. Code:** Conform all installations to Code. In case of conflict between Contract Documents and Code, the more stringent requirements shall govern.
- B. Reference Specification:** Except as modified herein or required by Code, conform metal support systems for plaster to the Plaster Metal Framing/Lath Manual of the California Lathing and Plastering Contractors Association Inc., hereinafter referred to as Ref Spec.
- C. Tolerances:** Erect walls and partitions on straight lines, plumb, free of twists or other defects, and contacting a 10-foot straightedge for its entire length at any location. Erect all horizontal framing level within a tolerance of 1/8" in 12-feet in any direction. Erect sloped framing in true planes to same tolerance as horizontal framing.
- D. Regulatory Requirements:** Comply with all applicable requirements of ASTM C 754 and the referenced Manual as referred to above.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

- A. **Shop Drawings:** Shop Drawings showing details for each typical partition, wall, ceiling, and shaft support framing system will not be required, provided construction complies with Contract Documents.
- B. **Product Data:** Submit complete materials list for all Work of this Section.
- C. **Samples:** Submit such Samples as Architect may request.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. **Standard Plaster Studs:** Pressed steel non-load-bearing type, punched, minimum 20 gage, by current member of the Steel Stud Manufacturers Association (SSMA), with floor and ceiling tracks of same gage as studs, and shoes. Studs and tracks shall have the manufacturer's standard rust-inhibitive paint finish except furnish hot-dip galvanized studs with matching tracks at all exterior locations and where indicated or specified.
- B. **Screw-On Drywall Studs:** ASTM C645 and following requirements:
 - 1. **Standard Drywall Studs:** Of minimum 25 gage electrogalvanized steel having punched utility openings and knurled flanges at least 1-1/4" wide, with flange returns, except where 20 gage or heavier is shown or specified.
 - a. Roll-formed C channel with knurled edges and keyhole shaped punched openings along the web, widths as indicated on drawings.
 - b. Shaftwall Studs: C-H type studs, as manufactured by US Gypsum or equal, size as required or as indicated on the drawings.
 - 2. **Stud Height:** Gages specified above are minimum. Where required stud height exceeds Code approvals, provide heavier gage studs and/or decrease stud spacing as necessary to conform to Code approvals, at no extra cost to Owner.
 - 3. **Stud Accessories:** Provide all standard related accessories including floor and ceiling tracks, clips, fasteners, and the like, of the same manufacture as each type of stud specified, as required for complete installations.
- C. **Furring and Runner Channels:** Hot-rolled or cold-rolled steel channels coated with rust-inhibitive paint and weighing per 1,000 lineal feet, before coating, not less than:

Size	Hot-Rolled	Cold-Rolled
3/4 inch	300 lbs.	300 lbs.
1-1/2 inch	1120 lbs.	475 lbs.
2 inch	1260 lbs.	590 lbs.

- D. Screw-On Drywall Furring Channels:** ASTM C645, minimum 0.022" thick zinc coated steel, minimum 1-3/4" face, 2-3/4" base span, and 7/8" furring depth.
 - 1. Hat Shaped: 7/8" deep with 1-3/8" screwable surface and 1/2" wing flanges equal to USG DWC-25.
 - 2. Z-Shapes: Fabricated with 7/8" attachment flange, 1-1/4" face flange, by depth as indicated on drawings, equal to USG Z-Galvanized Furring Channels.
 - 3. Resilient Channels: Equal to USG RC-1 galvanized resilient channels, 1/2" deep.

 - E. Stiffeners and main Runner Channels:** Cold-rolled or hot-rolled steel channels, size as required, coated with non-inhibitive paint. Use Bridge Clip as manufactured by The Steel Network, or equal with locking down cold rolled channels.

 - F. Ceiling Deflection Track:** Provide one of the following: 1) 20 gage No. 53 Flex Track, deep leg track manufactured by Superior Metal Trim, or equal conforming to requirements of ASTM C645 or 2) VertiClip SLD deflection clip, in conjunction with 25 gage standard track for interior walls.

 - G. Wires:** ASTM C 754, soft-annealed galvanized steel wire, 8 gage for hanger wires and 16 gage for framing unless otherwise specified.

 - H. Sound Insulating Tape Seals:** "Bear Tape" by Norton Industries, or equal.

 - I. Acoustical Sealant:** By USG, Gold Bond, or equal, permanently resilient type.

 - J. Metal Primer:** Red Oxide Primer or equal.

 - K. Steel Backing Plates:** Fabricate of minimum 4" wide by 16 gage steel except as otherwise indicated. Apply shop coat of metal primer.
- 2.02 ACCESS PANELS: Inryco/Milcor; Style K at plaster; Style DW for wallboard finish; Style M-Standard at masonry; Style M-Stainless at ceramic tile; Style AP or AT as required at ceilings. For fire-rated walls, provide fire-rated access doors bearing required UL fire-resistive label.

PART 3 - EXECUTION

- 3.01 INSTALLATION OF STUD TRACKS: Bolt or screw fasten to metal and anchor at least 1-1/4" into concrete with bolts and expansion shields, sleeved "dryvins", cinch anchors, screws and lead plugs, drilled and bolted steel shells, powder-driven fasteners, or other approved device. Concrete nails are not acceptable. Secure all tracks within 6" of ends and at spacing to resist design loads, maximum 36" centers between unless otherwise indicated.

3.02 PLASTER WALL FRAMING AND FURRING:

- A. Standard Plaster Studs:** Install for walls not otherwise indicated or specified, spaced at 16" centers, complete with tracks and shoes. Allow for deflection of structure above. Provide doubled studs at jambs of openings more than 16" wide. Exterior walls shall be vertically self-supporting such that gravity loads are not delivered to perimeter roof beams. Connections to the perimeter roof beams shall allow for beam deflection.
1. Lateral Bracing: Lateral bracing shall be provided by use of gypsum board and gypsum sheathing or by horizontal straps or cold-rolled channels. Bracing shall conform to Section D3 of the AISI Specifications.
 2. Wall Openings: At doors and other openings more than 16" wide, install lateral bracing horizontally not over 6" above opening head. Extend beyond the second stud on each side of opening. Provide lateral bracing 6" below sill of wall openings in same manner.
- B. Wall Furring For Plaster:** Install metal stud or channel furring as indicated. Secure channel furring with adjustable steel brackets at maximum 32" centers vertically and horizontally.
- C. Welding Repair:** Wire brush, scrape, and remove burned or damaged factory paint finish. Coat all welds and bare metal with metal primer.

3.03 WALL FRAMING AND FURRING FOR GYPSUM DRYWALL:

- A. Screw-On Drywall Studs:** Provide 25 gage studs at maximum 24" centers except as otherwise shown, specified, or required under Subparagraph "Stud Height". Secure to top track in manner that allows for deflection of structure above. Provide full height doubled studs at jambs of openings. Form heads and sills of openings with track sections screwed or bolted to jamb studs, unless otherwise shown. Install 16 gage studs at wall-hung lavatories, urinals, grab bars, wall-hung equipment, and elsewhere shown.
- B. Walls Over 6" Wide:** Where partitions are shown with stud dimensions more than 6" in depth, install two rows of 2-1/2" minimum wide studs, using 1-1/2" runner channel cross ties at 16" centers vertically and 24" centers horizontally, all bolted, screw fastened, or welded in place. In lieu thereof, install systems equal to Expandable partition No. 7 (Blue Diamond Company) in conformance with manufacturer's requirements.
- C. Wall Bracing:** Lateral bracing shall be provided by use of gypsum board and gypsum sheathing or by horizontal straps or cold-rolled channels. Bracing shall conform to Section D3 of the AISI Specifications. At heads of all doors, and heads and sills of wall openings, provide lateral bracing extending to the second stud beyond each side of jambs.

- D. **Wall Furring:** Install metal stud or channel furring as indicated.

3.04 SUSPENDED CEILINGS, SOFFITS, AND FURRING:

- A. **Hanger Wires:** Secure to the structure above according to Code and the approved submittal. Allow sufficient length for two or more complete turns around runner channels at proper ceiling height.
- B. **Suspended Plaster Framing:** Provide 8 gage hanger wires at maximum 36" centers along 1-1/2" runner channels spaced at maximum 48" centers, and 3/4" furring channels spaced at maximum 16" centers, all wire tied. Install the framing for unrestrained ceilings and soffits unless otherwise shown.
- C. **Suspended Gypsum Wallboard Framing:** Provide 8 gage hanger wires at maximum 48" centers along 1-1/2" runner channels spaced at maximum 48" centers, and screw-on drywall furring channels spaced at maximum 16" centers; secure to runners with Code approved galvanized steel clips or wire ties.
- D. **Connections:** Turn twice or saddle tie hanger wires around runner channels and twist three times around standing wire. Adjust hanger wire to bring furring and ceilings to level and true plans. Lap runner channels a minimum 12" at splices and tie with a double wrap of 16 gage wire 2" from each end of splices. Saddle tie furring channels to each runner channel with not less than two strands of 16 gage tie wire. Lap furring channels 8" minimum at splices and tie with a double wrap of 16 gage tie wire 1" from each end of splices.
- E. **Suspension Under Ducts:** For hangers spaced at 4 to 5-1/2 foot centers, provide 6 gage hanger wires with minimum 2" runner channels at maximum 48" centers. For greater spans, design system for live load of 10 pounds per square foot of area plus dead load and detail in Shop Drawings.
- F. **Furring:** Provide framing for horizontal furring as shown and required. Conform to above requirements as applicable.

3.05 BACKING AND ANCHORAGE: Install and attach to metal studs or furring for anchoring items indicated or specified in other Sections. Comply with approved submittals specified under other Sections as applicable to steel backing. Backing may be omitted where anchorage for wall-hung items is directly into steel studs of 18 gage or heavier, or items are furnished with equivalent mounting devices. Install backings of lengths to span over at least two supports, equipped with two countersunk machine screws at each support except backing may be welded to supports 18 gage or heavier. Wall-mounted items requiring backing include without limitation the following:

1. Wall railings.
2. Grab bars.
3. Toilet compartments and urinal screens and toilet room accessories.

4. Millwork.
5. Equipment (where indicated on drawings and in equipment schedule)

- 3.06 CONNECTION TO CEILING: Provide premolded neoprene filler strips matching the ceiling profile for non-fire-rated walls and partitions covered on one or both sides up to decking. For fire-rated walls and partitions, provide minimum 26 gage galvanized steel closure plates at tops of partitions fastened to decking. Use plates precision cut to fit the decking profile, installed on both sides, and pack the void spaces with UL listed and labeled incombustible mineral wool safing insulation. Where the top tracks are parallel to ceiling and do not fully close ceiling spaces, provide a safing insulation filler and minimum 18 gage galvanized steel plates screw fastened to close the ceiling spaces and secure the top tracks to the plates. Fully detail all conditions in Shop Drawings.
- 3.07 ACCESS PANELS: Install and rigidly connect to metal framing. Coordinate the exact required locations with related trades. On acoustical unit ceilings, install the panels to align with and maintain the grid pattern. Check all other Sections of Specifications for access panels specified to avoid duplication.

END OF SECTION

SECTION 09250

GYPSUM WALLBOARD

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide gypsum wallboard complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Gypsum wallboard finish on walls and ceilings.
2. Interior tile backer board.
3. Joint, edge, corner, and fastener finishing.
4. Sound insulation in gypsum wallboard partitions.
5. Sound and airsealing Work of this Section.
6. Skimcoat finish where scheduled.

B. Related Work Not In This Section:

1. Wood/metal stud support framing.
2. Thermal insulation.
3. Painting.

1.02 SUBMITTALS: Refer to Section 01300 for procedures.

A. Product Data: Submit covering wallboard installations, including accessories, finishing, sealing, and manufacturer's written installation instructions with copies of Code approvals for each wall, ceiling, and shear wall system.

B. Samples: Submit such Samples as Owner and/or Architect may request.

1.03 JOB CONDITIONS: Make a detailed inspection of areas and surfaces to be enclosed or covered by gypsum drywall and arrange for correction of defective workmanship or materials. Ascertain that other Work enclosed by drywall has been inspected and approved before starting installation; otherwise, uncover as directed at no extra cost to Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURE: Refer to Section 00880 for product and finish selections. Use products of only one manufacture throughout for each specialty item specified unless otherwise noted or approved.

2.02 MATERIALS:

- A. Gypsum Wallboard:** ASTM C36, provide 5/8" Type X or Type C gypsum board, or any other type of drywall that may be required by fire rated assemblies shown on drawings, tapered edges for exposed surfaces, regular grade by the Code. For walls in toilets and bathrooms, and where indicated, provide Type W/R or Type X W/R water resistant boards as required by the jurisdiction and where recommended by the Gypsum Association. Gypsum wallboard manufacturer and type shall match description of rated fire assemblies. Assemblies may be proprietary.
- B. Interior Tile Backer Board:** For walls in toilets and where indicated on drawings or required, provide Durock or WonderBoard Tile Backer Board. Install per manufacturer's recommendations.
- C. Screws:** ASTM C646, corrosion-resistant self-tapping bugle-head spiral threaded type, minimum 1" long except 1-5/8" for double layer walls or longer where RC channels are used, lengths to penetrate all supporting metal at least 3/8". Furnish specially hardened type screws where required by code for support.
- D. Drywall Nails:** ASTM C514, supplied or recommended by the wallboard manufacturer, No. 13 gage 1-5/8" long, 19/64" head, Dry Tite, acid etched or No. 098 gage, 1-3/8' long annular ringed 6d, cooler nails.
- E. Metal Trim and Corner Beads:** Of electrogalvanized steel with taping flanges, as manufactured or recommended by drywall manufacturer, corner beads at all outside corners and "J" shaped trim members where abutting other materials. Provide "bullnose" corner beads at all areas, unless otherwise required by the Architect/Owner.
- F. Finishing Materials:** ASTM C475, joint tape, joint bedding compound, finishing cement, adhesive, and laminating compounds supplied or recommended by wallboard manufacturer.
- G. Calking Compound:** Permanently non-hardening type as supplied or recommended by wallboard manufacturer.
- H. Sound Insulation:** Owens Corning Fiberglass batts maybe used in locations as approved by the Architect in advance for interior sound control. "Thermafiber" friction fit fibrous batts, nominal 2.80 pcf density by USG Corp are required for fire rated assembly meeting the required 2.80 pcf density as stated above.
- I. Resilient (RC) Furring:** ASTM C645, minimum 25 gage, either "Z" or "hat shaped" as indicated or required, designed for sound reduction by gypsum wallboard manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION OF GYPSUM WALLBOARD:

- A. **General:** Perform wallboard installation and finishing according to ANSI A997.1 and the wallboard manufacturer's instructions. Do not install wallboard until building is weathertight. Conform to fire-rating requirements, Building Code approvals, and requirements herein.
- B. **Temperature:** Maintain minimum 65 degrees F within building during installation. Furnish ventilation to eliminate excessive moisture.
- C. **Fasteners:** Install screws or nails so heads are below wallboard surface without breaking surface paper around the fastener. Space screws according to listed assembly requirements.
- D. **Openings:** Accurately cut and fit the wallboard at openings. At door and other openings, cut wallboard to continue across area above opening head; do not cut board to both jambs and fill in area over openings with separate pieces. Make the dimension from joint over head of an opening to jamb of openings 6" minimum. Stagger joints on opposite side of partition. Maximum opening around electrical outlets 1/8" calked.
- E. **Single Layer Walls:** Place wallboard horizontally with long dimension across the studs or in one-piece vertical heights, vertical joints centered on supports and staggered on walls so as not to occur on opposite sides of same stud. Secure to each stud and tack with screws keeping screws 3/8" from edges.
- F. **Multi-Layer Walls:** Apply first layer same as for single layer walls, all joints in subsequent layers staggered with respect to first layer.
- G. **Ceilings:** Apply wallboard with long dimension at right angles to the framing, end joints staggered and centered over framing. Use boards of maximum practical length to minimize end joints and properly support around cutouts and openings. Secure with screws or nails.

- 3.02 JOINT TREATMENT AND FINISHING: Apply tape bedding compound, tape, and at least three coats of finishing cement on exposed joints, and other joints as required for sound insulating or fire-rated construction. Apply joint cement and two or more layers of finishing cement over screw or nail heads. Treat all inside corners with joint cement, tape, and finishing cement. Treat all outside corners with corner beads and finishing cement. Provide metal casing beads at all edges of gypsum wallboard which abut ceiling, wall, or column finish, and elsewhere as required, such as openings, offsets, etc. Make all exposed joints, trims, and attachments non-apparent following application of paint or other finishes; if the joints and fasteners are apparent, correct defects as directed with no extra cost to Owner. Seal the raw edges of plumbing openings and of boards that have been cut to fit with manufacturer's recommended sealant brushed on. When entire

installation is completed and prior to installation of finish materials by other trades, correct and repair broken, dented, scratched, or otherwise damaged wallboard surfaces.

3.03 AIR SEALING: Seal connections between shaft walls, ducts, plenums, and building structure airtight with specified calking compound or tape and cement, including vertical shafts.

3.04 SOUND INSULATED PARTITIONS: Install sound insulation continuously between studs from finish floor to top of wall in which it occurs. Where cutouts are made for J-boxes, conduit, piping, and like items, back wall insulation with insulation so that one additional layer of insulation at least 24" wide and high is placed in back of cutout. Snugly fit in place free of gaps or holes. Calk between the wallboard edges and floors, walls, and at structures above other than acoustical ceilings with calking compound, forming a complete perimeter seal. Calk around outlet boxes and other penetrations in same manner. Where resilient channels occur a separate fastener will attach the RC channel to the framing member. The gypsum wallboard will be attached to the RC channel and will at no time fasten directly to a framing member.

3.05 SKIM COAT FINISH: Provide where scheduled, apply USG Product that will produce a "orange peel" texture or "smooth" finish as indicated and as approved by Owner/Architect. Apply after taping and screw head finishing is dry and sanded to produce surfaces free of trowel marks or other defects.

A. **GA 214** - Gypsum wallboard finish shall conform to requirements of GA 214, and as specified herein. Levels required for the Work are described as follows:

Level 3:

All joints and interior angles shall have tape embedded in joint compound and one additional coat of joint compound applied over all joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges.

Level 4:

All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges.

END OF SECTION

SECTION 09300

TILE MASONRY

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide tile masonry finish complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Glazed ceramic tile walls and bases.
2. Unglazed porcelain tile floors.
3. Expansion joints.
4. Brass, zinc, bronze or aluminum edging angles at exposed floor tile edges.

B. Related Work Not In This Section:

1. Gypsum and cementitious wallboard backing for tile walls and bases.
2. Concrete subslabs.
3. Membrane waterproofing.
4. Metal thresholds.

1.02 QUALITY ASSURANCE:

A. Reference Standards: Conform to following standards unless otherwise required herein:

1. American National Standards Institute (ANSI).
 - A108.1 Glazed Wall Tile, Ceramic Mosaic Tile, Quarry Tile and Paver Tile Installed With Portland Cement Mortar.
 - A108.5 Ceramic Tile Installed With Dry-Set Portland Cement Mortar.
 - A108.6 Ceramic Tile Installed With Chemical Resistant Water Cleanable Tile-Setting and Grouting Epoxy.
 - A118.1 Dry-Set Portland Cement Mortar.
 - A118.3 Chemical-Resistant Water-Cleanable Tile Setting and Grout Epoxy.
 - A118.4 Latex-Portland Cement Mortar.
 - A137.1 Standard Specifications for Ceramic Tile.
2. Tile Council of America (TCA).
 - a. Handbook for Ceramic Tile Installation, Current Edition.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Samples: Obtain Architect's instructions and submit the following for selection and approval:

1. Each type, shape, and trimmer of tile in each color proposed for use.
2. Grout colors for tile.
3. Cured sealant colors for expansion joints in tile.
4. Brass, zinc, bronze or aluminum edging angles, 12" lengths.

B. Product Data: Submit the manufacturer's printed directions for latex mortar and latex waterproofing.

C. Master Grade Certificates: Submit for each lot of tile before installing.

1.04 MOCK-UP: If required by Architect provide all labor and materials to build and test mock-up. Mock-up shall accurately represent job conditions including joints, sealants, tile underlayment, anchors and tile finishes. Construct mock-up in strict accordance with approved Shop Drawings. Any deviations from or additions to details shown on Drawings are subject to the Architect's approval.

1.05 PRODUCT DELIVERY AND STORAGE: Deliver all tile to the site in unopened factory containers sealed with Grade Seal bearing printed name of manufacturer and the words "Standard Grade". Keep grade seals intact and containers dry until tiles are used. Keep cementitious materials dry until used.

1.06 JOB CONDITIONS:

A. Conditions: Inspect and verify surfaces according to Section 01400 and report defects to Architect for correction before proceeding.

B. Protection: Provide protection wherever required. Do not use lumber or other material likely to stain or deface installed materials. Close tile flooring to traffic completely for 24 hours after installation; thereafter, permit traffic only over protective covering of heavy paper or equivalent.

PART 2 - PRODUCTS

2.01 BASIC MATERIALS: Dal Tile or approved equal.

Portland cement:	ASTM C150. Type I or II, low alkali.
Dry-set portland cement mortar:	ANSI A118.1, white or gray as specified.
Hydrated lime:	ASTM C207, Type S.
Mortar sand:	ASTM C144, at least 4% passing No. 100 sieve.

Joint sand:	Same as mortar sand except as passing No. 30 sieve.
Water:	From domestic potable source.
Admix:	Anti-Hydro, Sika Red Label Suconem, or equal.
Reinforcing mesh:	Galvanized welded wire mesh, 1-1/2" by 2" mesh or 2" square mesh, minimum 16 gage, or equivalent or equal steel cross-section area.
Metal lath:	Expanded from galvanized steel sheets, 3.4 pounds per square yard, self furring type, galvanized nails, or as specified for reinforcing mesh.
Latex mortar:	ANSI A118.4 (factory inclusion of aggregate is not required), one of the following, or equal: Mer-Krete Tile Setting Adhesive. Custom-Crete Custom Building Products. Laticrete by Laticrete International.
Latex admix:	For joint grout, by same manufacturer as above latex mortar.
Epoxy, tile setting mortar and grout:	ANSI A118.3, as indicated on drawings and color as selected by Architect.
Waterproofing membrane:	The Noble Company, Chloroloy 240-CPE for wire reinforced mortar beds. Nobleseal TS for thin set tile applications, or approved equal.
Color pigments:	Pure ground mineral oxides, non-fading, alkali and lime proof, factory weighed and packaged.
Tile backer board:	Provide GP Dens Shield or Durock backer boards, thickness as indicated for interior and exterior applications as approved by the Architect.

2.02 **TILE MATERIALS:** Standard Grade conforming to ANSI A137.1, of following types. Perforated paper backed tile is not acceptable where the paper remains as a permanent part of installation.

- A. Glazed Wall Tile:** Tile as scheduled on drawings, colors as selected, dust pressed, white body, square edged, with two integral joint spacing lugs on all edges, matte glazed, with matching integral cove base having spherical corner and angle units, integral bullnose for external angles and exposed edges, and integral cove for internal angles.
- B. Unglazed Floor Tile:** Tile as scheduled on drawings colors and patterns as selected, porcelain type unglazed tile, cushion or all-purpose edges, premium colors and patterns, square unless otherwise shown.
- C. Non-Slip Unglazed Floor Tile:** As above for unglazed floor tile, containing at least 7-1/2% of non-rusting abrasive aggregate. Provide for floors and tile floors in wet areas.

- 2.03 **SETTING BED MORTAR:** Machine mix mortar after first dry mixing materials. Mix mortar not less than 5 minutes after water is first added. Accurately measure materials using calibrated measuring boxes; shovel measurement is not permitted. If required add admix for flexibility as recommended by Manufacturer. Discard mortar that is not placed and compacted before initial set is reached. Measure all materials by volume. Provide epoxy mortar where required by Code, conforming to ANSI A118.3, color as scheduled or as selected by Architect.
- 2.04 **BOND COAT:** White or gray portland cement mixed with water and latex admix to a creamy consistency. For glazed wall tile only, gray or white dry-set portland cement mortar mixed in the same manner may be used. Do not add water or cement after initial mixing, and discard material not used prior to initial set.
- 2.05 **TILE JOINT GROUT:** Provide Laticrete Premixed, Sanded Grout as indicated on the drawings.
- 2.07 **EDGING ANGLES:** Extruded aluminum as indicated or required of minimum 1/8" leg thickness, as approved.

PART 3 - EXECUTION

- 3.01 **PREPARATION:** Clean substrates of dust, dirt, oil, grease, and other deleterious substances. Conform preparation to requirements of the applicable Reference Standards and to recommendations of manufacturers of materials used.
- A. Concrete Slabs To Receive Mortar Setting Beds:** Keep concrete damp for at least 8 hours and scrub with a neat portland cement slurry just before placing setting bed mortar.
- B. Gypsum Wallboard or Cementitious Board:** Prime with epoxy or latex primer as required or admix if required by instructions of epoxy or latex mortar manufacturer.
- 3.02 **TILE INSTALLATION:** Arrange tile surfaces according to the patterns detailed or approved. Accurately set tile with flush well-fitted joints, finished in true plan, plumb, square, sloped or level as required. Neatly cut and fit the tile closely against abutting surfaces. Construct joints of uniform width. Form corners and returns with approved trimmers. Neatly drill and cut tile without marring. Carefully grind and joint tile edges and cuts. Fit tile close around outlets, pipes, and fixtures so that escutcheons or collars overlap the tile. Arrange surfaces so that not less than half-size tile occurs. Drill holes for pipe penetrations through wall tile, do not cut or split tile, and set with tight ungrouted joint.
- A. Reinforcing Mesh:** Provide mesh at the center of all mortar setting beds that are not direct-bonded to concrete slabs, lapped one full mesh and wire tied at splices. Keep mesh 1" away from expansion joints and walls. Run mesh up walls and over curbs of shower receptors, but do not secure through waterproofing.

- B. Mortar Bed Set Tile:** Dampen glazed wall tile according to applicable Reference Standard. Apply setting bed mortar, mixed as specified, and screed surfaces of setting beds to required planes. Spread no more mortar than can be covered with tile before mortar initially sets. No retempered mortar may be used. Lay tile to avoid small or unsightly cuts. Set tile with uniform joint width. Trowel a 1/32" to 1/16" thick bond coat over the plastic setting bed mortar just prior to setting tile or apply to back of each tile as placed; use white bond coat where white tile joints occur. Set tile in position and beat firmly into the mortar. Bring tile faces to a true and proper plane. Complete all beating and leveling before mortar sets and in no case later than one hour after first placing. When ready, wet and remove paper and glue, avoiding the use of excess water. At this time adjust any out-of-line or out-of-level tile.
- C. Thin-Set Tile:** Mix epoxy or latex mortar according to manufacturer's directions. Do not dampen tile. Conform to the instructions of both mortar and tile manufacturers. Apply mortar to areas no larger than can be covered with tile within 30 minutes. Remove traces of mortar from tile surfaces before final set.
- D. Latex Waterproofing:** Apply according to manufacturer's directions, sealed into floor drains and turned up at walls. Pond test for 24 hours, repair all leaks, and retest until no leakage occurs.
- E. Joint Sizes:** Install tile with uniform joint widths as follows:
1. Glazed wall tile, 1/16" with maximum 1/8" at any location, unless otherwise indicated.
 2. Porcelain floor tile, 1/16" with maximum 1/8" at drains and any other location, unless otherwise indicated.
- F. Porcelain Tile Joint Grouting:** Grout joints full after washing out and saturating with clean water. Mix grout with water to a thick creamy consistency and force into joints for entire joint depth, flush with surface. Clean off all excess and fill skips and gaps before grout sets. Provide dampness for minimum 3-day curing and polish with clean dry cloths.
- G. Calking:** Calk all penetrations through wall tile with latex mortar or sealant conforming to Section 07900, concealed by collars or escutcheons.
- 3.03 **EXPANSION JOINTS:** Joints shall extend down for the full depth of mortar setting bed. Provide joint backing and sealant according to Section 07900, sealant of color to match joint grout and maximum 3/8" depth. Provide expansion joints in mortar set floor tile and paving areas where indicated and where abutting rigid structures. Install at toe of cove base where base occurs. If not indicated, install expansion joints in the same manner and at maximum 16-foot intervals in runs, located as directed. Provide sealant joints that closely match the color and appearance of grouted joints but of minimum 1/8" width. Provide as required by installation and as recommended by the Tile Council of America. Joints to comply with Method EJ171. Consult Architect as to placement.

3.04 CLEANING: Remove stains, cement, grout, and foreign matter when grouted joints fully set. Do not use acid. Repair all defective joints as approved.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide resilient flooring and base complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Vinyl composition tile flooring
2. Sheet (self-coving) vinyl flooring
3. Rubber and/or vinyl base
4. Reducer strips.

B. Related Work Not In This Section:

1. Raised metal thresholds.

1.02 QUALITY ASSURANCE: Furnish products by the following manufacturers, or approved equals:

Resilient Flooring

Armstrong World Industries
Mannington Commercial

Rubber Base

Burke Rubber Company
Roppe Rubber Corporation

1.03 SUBMITTALS: Refer to Section 01300 for submittal procedures.

A. Samples: Submit the following for selection and approval:

1. After selection, submit full-size Samples of each selected color or pattern of flooring and base for final approval.
2. Reducer strips and trims.

B. Data: Submit copies of the flooring manufacturer's recommended standard dryness testing, ADA, Section 4.29 compliance and required test results, and installation instruction for each type of flooring and base for approval.

C. Moisture Testing Results: Submit written reports covering all moisture test results for record purposes only and not for approval.

D. Maintenance Materials: At completion, deliver following maintenance materials to the Owner in unopened factory containers or in sealed cartons with labels identifying the contents, matching installed materials. Include unopened cans of adhesives adequate to install the maintenance materials.

1. Vinyl composition tiles, 5 unopened boxes of each color and pattern.
2. Sheet vinyl flooring, one piece 20-feet long by full roll width for each location, type and pattern of flooring.
3. Rubber base, at least 100 lineal feet with 10 end stop units, 15 outside corner units, and 15 inside corner units.

1.04 **PRODUCT DELIVERY AND STORAGE:** Deliver materials to site in the manufacturer's original unopened labeled containers. Store all resilient flooring at minimum 70 degrees F for 48 hours before installing.

1.05 **JOB CONDITIONS:** Do not start flooring installation until satisfactory moisture testing results are obtained and the Work of all other trades is substantially completed, including painting. Keep the areas of installation and materials at minimum 70 degrees F during and for 10 days after installation is completed. Maintain adequate ventilation for the removal of moisture and fumes. Verify conditions as specified in Section 01400.

PART 2 - PRODUCTS

2.01 **MATERIALS:**

Vinyl composition tile:	Quality equal to or exceeding Fed Spec SS-T-312, Type IV, 12" by 12" by minimum 1/8", Mannington Commercial, materials and patterns as scheduled on drawings or as selected by Architect .
Sheet Vinyl:	Quality equal to "Premium" line of Armstrong World Industries, (Self-Coving) with inorganic Hydrocord backing, 0.090" gage with 0.050" wear layer, colors and patterns scheduled on drawings or as selected by Architect.
Rubber base:	Coved top-set 4" and 6" high as indicated on drawings using colors as scheduled on drawings or as selected by Architect, non-shrinking, 1/8" thick, with matching molded inside and outside corners and end stops.
Setting materials:	Adhesives, primers, and fillers of type and composition recommended by materials manufacturers, cut-back or equal types not containing water, factory labeled as to substrates on which application is approved by the manufacturer.
Reducer strips:	Extruded aluminum, edge-butting (not lapping) type.

PART 3 - EXECUTION

3.01 **INSTALLATION:** Conform to flooring manufacturer's recommended moisture testing and installation procedures and to requirements herein.

- A. Preparation:** Clean substrates of all deleterious substances and foreign matter. Fill cracks or depressions with latex leveling compound of the type recommended

by flooring manufacturer for specific job conditions. Prior to laying flooring, test concrete for adequate dryness using the testing procedure conforming to flooring manufacturer's directions. Prime concrete floor slabs on grade; prime other slabs if so recommended by flooring manufacturer.

- B. Vinyl Composition Tile Installation:** Mix sufficient quantity of tiles to complete each area before laying to avoid color variations. Install flooring with tight joints, pattern direction as approved. Lay flooring square with axis of rooms, starting on center lines with tile joint or tile center so that border tiles are not less than 4" wide, accurately aligned. Install reducer strips at exposed edges of flooring and where shown. Cut flooring mechanically to produce square true edges. Closely trim to pipes, jambs, outlets, and like conditions. Extend flooring into cabinets and casework without bottoms.
- C. Sheet Vinyl (Self-Coving) Flooring:** Fully bed in waterproof latex adhesive, all seams lapped and out in a manner that produces tight joints and preserves flooring pattern. Heat weld all seams and joints according to manufacturer's directions, free of gaps. Closely trim to pipes, jambs, outlets, and like conditions.
- D. Base Installation:** Securely cement to backing in long lengths, minimum 18" long filler pieces, top and toe continuously contacting wall and floor, all joints tight. Provide factory-made internal and external corners, and end stops where cove base ends at jambs and offsets.

3.02 **CLEANING, WAXING, AND COMPLETION:** Keep all flooring and base surfaces clean as installation progresses. Clean flooring and base when sufficiently seated and remove foreign substances. Immediately prior to Owner's acceptance of building, apply wax on resilient tile flooring in accordance with manufacturer's instructions. Clean adjacent surfaces of adhesive or other defacement. Replace all damaged or defective Work to the original specified condition.

END OF SECTION

SECTION 09682

CARPET

PART 1 - GENERAL

- 1.01 DESCRIPTION: Division 1 applies to this Section. Provide carpeting complete as indicated, specified, and required.
- 1.02 QUALITY ASSURANCE:
- A. Qualifications of Installing Mechanics:** Employ skilled journeymen carpetlayer mechanics.
- B. Requirements of Regulatory Agencies:** Carpeting shall meet the requirements of Federal, State and Local Regulatory Agencies for flammability, static control, or other properties as required and as specified herein. The carpet, pad and method of installation shall conform to CBC Section 1124B.3 with the pile height conforming to CBC Section 1124.3 and carpet edges conforming to CBC Section 1124B.2
- 1.03 SUBMITTALS: Refer to Section 01300 for procedures.
- A. Layout Shop Drawings:** Submit showing dimensioned layout of all seams, location of dye lot changes, and details for binder bars. Approval does not relieve the Contractor of responsibility for the satisfactory installation of carpet.
- B. Samples:**
1. Master Samples: Submit three labeled minimum carpet Samples from each dye lot of carpet required for the Work. Samples shall demonstrate that dye lots acceptably match and there will be no apparent color change between carpet pieces of different dye lots.
- C. Sample Installations:** Prepare as many Sample installations as are required for approval. Use preparation techniques, installation materials conforming to approved submittals, and installation methods proposed for the Work. Architect will closely examine installations for workmanship, appearance, alignment and preservation of carpet pattern, non-detectability of seams when viewed from any direction or distance at the height of a standing or sitting person, and freedom from manufacturing or installation defects of any kind. Finally approved Sample installations establish the quality required for all carpet installations, shall be identified and recorded, and shall remain in place. Sample installations are required for:
1. All carpet in one areas designated by Architect.

D. Product Data: Submit the following:

1. Carpet manufacturer's published technical data fully describing all carpet materials, construction, and recommended installation directions.
2. Technical data and usage instructions for each adhesive and sealer material.
3. Carpet manufacturer's published instructions for maintenance care, cleaning, and repair of carpet (5 copies).

E. Certificate: Submit a certificate from the carpet manufacturer that materials supplied comply with fire hazard resistance standards specified.

F. Maintenance Materials: Owner will select the amount of carpet to be retained for maintenance purposes.

1.04 **PRODUCT DELIVERY, STORAGE, AND HANDLING:** Deliver materials in original unbroken packages, containers, or bundles bearing name of manufacturer, complete material identification, brand, and grade. Store in dry ventilated locations. Handle by methods that prevent damage, soiling, and contamination. On delivery of carpet material, bale ticket on each roll shall be recorded by Contractor and delivered to Owner.

1.05 **JOB CONDITIONS:**

A. Ventilation and Temperature: Verify that areas to be carpeted are ventilated to remove fumes from installation materials, and areas are within temperature range recommended by the various material manufacturers for installation conditions.

B. Protection: Keep traffic and personnel off carpet until at least 12 hours after installation. Cover carpet with heavy non-staining kraft paper or equivalent in areas where Work of other trades is to be performed and passage areas. Protect carpet from damage or soiling. Keep protection in place until ready for final clean-up operations.

1.06 **WARRANTY:** Refer to Section 01740. Furnish a written warranty to Owner for one year covering defects in materials or workmanship. Include trimming, relaying, or replacement as necessary, at no cost to Owner. Warranty must be issued by Carpet Manufacturer.

PART 2 - PRODUCTS

2.01 **SUBSTITUTIONS:** Refer to Section 01600. If required by the Owner or Architect, proposed substitute carpet shall be subjected to analysis at the Contractor's expense by a recognized testing laboratory, such as the Pittsburg Testing Lab, to determine the quality of proposed materials. Request for substitution shall be accompanied by a list stating the characteristics which differ from those of carpet specified with supporting data to justify the differences.

2.02 CARPET MATERIALS:

- A. **Identification and Labeling:** Carpet shall bear a positive identification by a label service showing the carpet fire hazard classification as determined by a nationally recognized testing laboratory such as UL.
- B. **Test Standards:** Carpet shall pass following tests and be so labeled:
 - 1. Department of Commerce FF-1-70 Methanamine Pill Test or Radiant Panel Test (FRP), Critical Radiant Flux (CRF) of 0.507 watts per sq. cm.
 - 2. Flame and smoke spread, Class I Rating.
 - 3. Average corrected smoke density of 450 or less as determined by NBS Smoke Density Chamber Test.
 - 4. Yarn weight per carpets as scheduled between 32 and 40 oz.
 - 3. Pile thickness per carpets as scheduled.
 - 4. Tuft gauge per carpets as scheduled.
 - 5. Pile density (UM 44 D) 5735
 - 6. Backing structure per carpets as scheduled either "Lifespan" by Atlas and backing structure by designweave.
 - 7. Face Yarn: Antron Legacy Nylon.
 - 8. Lifetime Warranty against edge ravel, delamination or tuff bind.
- C. **Carpet Width:** Provide carpet(s) in width as scheduled on drawings.
- D. **Carpet:** Provide carpet in color(s) and patterns as scheduled on drawings location by location.
- E. **Carpet Primer and Adhesive:** Provide primer barrier coating and pressure sensitive adhesive, install in accordance with manufacturers specifications and recommendations.

2.03 RELATED MATERIALS: Use following products unless other materials are specifically recommended and named in carpet manufacturer's technical data.

- A. **Leveling Compound:** Latex type compound, Merkote Products "Mer-Ko Underlay L" or Crossfield Products "Dex-O-Tex G-26 Underlayment". Verify that the compound is compatible with floor adhesive.
- B. **Binder Bars:** Aluminum or other material as scheduled on drawing stackless binder edging by B&T Metals, Roberts Company, or Trimedge.

PART 3 - EXECUTION

3.01 INSPECTION: Verify conditions as specified in Section 01400. The Contractor, carpet supplier, and carpet installer shall inspect concrete floor slabs prior to start of carpet

installation and shall report to Architect, in writing, all conditions which will adversely affect installation of carpeting. Do not begin carpet installation until all reported conditions are corrected.

3.02 **PREPARATION:** Do not start preparation until concrete floor slabs are at least 90 days old. Conform to the recommendations of Carpet Manufacturers. Contractor shall obtain written instructions as to each type of application and/or installation prior to starting of the Work.

- A. Cleaning and Drying:** Clean slabs of oil, grease, waxes, curing compound, dust, dirt, debris, paint, and other deleterious substances. Verify that concrete is dry and vapor emission levels should not exceed three pounds as determined by the proper application of the calcium chloride test, if higher than 3 pounds, STOP INSTALLATION, number of tests as needed to ensure that slabs are dry but at least one test per floor and for every 2500 square feet of floor area. Allow slabs showing excessive moisture to dry and re-test until dried to tolerance allowed by floor adhesive manufacturer. Use a commercial vacuum cleaner to remove dust and dirt. Damp mop to remove dust that may remain after first vacuuming, allow surface to dry, and again vacuum; repeat the procedure if necessary to eliminate all dust. Do not use oiled or chemical treated sawdust or any similar product for dust removal.
- B. Leveling:** All floor slabs shall be true to level and plane within a tolerance of 1/8" in 10-feet. Test floor areas both ways with a 10-foot straightedge and repair high and low areas exceeding allowable tolerance. Remove high areas by power sanding, stone rubbing or grinding, chipping off and filling with leveling compound, or equivalent method. Fill low areas with leveling compound. Repair and level the surfaces having abrupt changes in plane, such as trowel marks or ridges, whether or not within the allowable tolerance. Again clean areas where repairs are performed.

3.03 **CARPET INSTALLATION:**

- A. General:** Install carpet in each dye lot in the number sequence furnished by manufacturer. Install carpet in one direction and do not reverse direction at any locations. Align carpet with centerline of room or space, and adjust at edges for wall variations.
- B. Color Control:** Plan dye lot change locations to eliminate shading problems and rejection. Use only one dye lot for each area of the building unless otherwise approved; if more than one dye lot is used, obtain prior approval of color match between dye lots.
- C. Laying and Seaming:** Follow highest quality professional installation procedures outlined by the National Association of Floor Covering Installers and the carpet manufacturer's directions as to workmanship. Preserve uniform row alignment and spacing on both sides and across seams. Lay carpet with tuft or

loop rows in straight lines both ways, free of offsets, waviness, distortion, or misalignment. Trim carpet at walls, columns, and penetrations for a compressed fit.

- D. Doorways:** Extend carpet into doorways without piecing in and seam to carpet on other side of door under door centerline except where metal thresholds occurs; no small filler pieces of carpet will be permitted at doorways.
- E. Adhesive Installation:** Do not stretch carpet during installation. Use notched trowel directed by adhesive manufacturer. Evenly spread adhesive free of excess or thin areas. Place and roll carpet within "open time" of adhesive. Coat all seam edges with seam sealer (not floor adhesive) applied to bottom of face yarn and entire edge of backings, and produce tight compressed seams free of gaps, peaking, or ridging. Roll or broom carpet towards open seams free of gaps, peaking, or ridging. Roll or broom carpet towards open seams or edges to expel trapped air and obtain full embedding in adhesive.
- F. Binder Bars:** Provide bars where required to secure precisely any tightly mitered angles.

- 3.04 **CLEAN-UP:** As each area is completed, clean up all dirt and debris, remove spots and soiling with proper cleaner, trim off loose threads with sharp scissors, and vacuum entire area clean.
- 3.05 **INSTRUCTION:** After installations are complete, carpet manufacturer's technical representative shall instruct Owner's personnel in maintenance of the installed carpeting tile. Give the instruction at time and location designated by Owner.
- 3.06 **COMPLETED INSTALLATIONS:** Clean and free of loose areas, defective or apparent seams, scallops, puckers, ripples, distortion, or other defects, and matching the quality of the approved Sample installation. All carpet installations not complying with these requirements, as determined by Architect, will be rejected. Contractor shall remove rejected carpeting tile and install new conforming carpeting at no extra cost to Owner.

END OF SECTION

SECTION 09900

PAINING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide and perform painting, complete.

A. Work In This Section: Principal items include:

1. Submittals.
2. Preparation of surfaces.
3. Painting of interior surfaces, except as otherwise specified.

B. Related Work Not In This Section:

1. Shop prime coats and factory finishes.
2. Painting specified as Work of other Sections.
3. Calking and sealants.
4. Miscellaneous work.

C. Surfaces Not To Be Painted:

1. Non-ferrous metal work (other than zinc-coated surfaces) and plated metal, unless particular items are specified to be painted.
2. Integrally colored concrete block.
3. Exterior concrete walls and surfaces.
4. Surfaces concealed in walls and above solid ceilings.
5. Non-metallic walking surfaces unless specifically shown or specified to be painted.
6. Factory finished surfaces.
7. Ceramic tile and plastic surfaces.
8. Resilient flooring and base.
9. Surfaces indicated not to be painted.
10. Surfaces specified to be finish painted under other Sections.

1.02 SUBMITTALS: Refer to Section 01300 for procedures.

- A. List of Paint Materials:** Prior to submittal of Samples, submit a complete list of proposed paint materials, identifying each material by manufacturer's name, product name and number, including primers, thinners, and coloring agents, together with manufacturers' catalog data fully describing each material as to contents, recommended usage, and preparation and application methods and all manufacturers warranties. Identify surfaces to receive various paint materials. All paints submitted must meet or exceed current State Of California health and environmental standards. All products submitted shall be free of ethylene glycol. Do not deviate from approved list.

- B. Color Samples:** Prior to preparing Samples, obtain Owner's color and gloss selections and instructions. Using materials from approved list prepare and submit 8-1/2" by 11" Samples of each complete opaque paint finish, making sure that all samples meet the gloss percentage criteria set forth in the finish schedule.
- C. Natural or Stain Finish Samples:** Prepare Samples on 12" squares of the same species and appearance of wood as used in the Work.

1.03 JOB CONDITIONS:

- A. Protection:** Protect all painting while in progress and cover and protect adjoining surfaces and property of others from damage. Exercise care to prevent paint from contacting surfaces not to be painted. During painting of exterior work, cover windows, doors, concrete, and other surfaces not to be painted.
- B. Examination of Surfaces:** Examine surfaces to be painted or finished under this Section and verify satisfactory condition; as specified in Section 01400, notify General Contractor and/or Owner and/or Architect in writing of unsatisfactory surfaces. Application of first coat of any finishing system constitutes acceptance of the surface by Painting Subcontractor. This does not relieve the Sub-Contractor from proper preparation of surfaces.
- C. Weather Conditions:** Apply paint to clean, dry, prepared surfaces. Do not apply exterior paint during rainy, damp, foggy, or excessively hot and/or windy weather. Arrange for temporary heat and ventilation required for interior painting.
- D. Precaution:** Place oily rags and waste in self-closing metal containers, removed from site at the end of each day. Do not let rags and waste accumulate.

PART 2 - PRODUCTS

2.01 **MATERIALS:** Use the paint products of only one paint manufacturer unless otherwise specified or approved. In any case, primers, intermediate, and finish coats in each painting system must be products of same manufacturer, including thinners and coloring agents, except materials furnished with prime coat by other trades. To the maximum extent feasible, factory mix each paint material to correct color, gloss, and consistency for application. Dunn-Edwards Paint Company products specified designate intended types and qualities. Furnish paints from one of the following manufacturers; refer to Section 01600 regarding substitutions:

Frazee
Tnemec

ICI - Sinclair
Sherwin Williams

PART 3 - EXECUTION

- 3.01 **WORKMANSHIP:** Apply painting materials in accordance with manufacturer's instructions by brush or roller; spray painting is not allowed without specific approval in each case. Apply each coat at the proper consistency, free of brush or roller marks, sags, runs, or other evidence of poor workmanship. Do not lap paint on glass, hardware, and other surfaces not to be painted; apply masking as required. Sand between enamel coats.
- 3.02 **PREPARATION:** Properly prepare surfaces to receive finishes.
- A. Clean all masonry** surfaces to be refinished of all dirt, dust, oil, grease, oxidized loose and scaly paint film, mildew, rust on metal and other foreign substances by a combination of the following methods to provide a clean sound surface prior to painting application:
 - 1. Existing masonry shall be clean by scraping and use "Armex" Sodium Bicarbonate based blast media or comparable products and systems. System or approved equal.
 - B. Repair all cracks,** holes and voids in surfaces to be refinished with appropriate sealants and repair compounds to insure permanency to the surfaces and compatible to the painting systems to follow. "Float-Off" and texture the patching materials, to match the adjacent surfaces. Allow repair compounds to fully dry prior to painting application.
 - C. Concrete:** Fill cracks, holes, and other blemishes with portland cement patching plaster or a stiff paste mixed of finish paint and fine sand, finished to match adjoining surface. Remove glaze by sanding, wire brushing, or light brush-off sandblasting. Neutralize alkali conditions according to paint manufacturer's directions. Dry the surfaces to receive breathing type latex paints at least two weeks, free of visible moisture. Dry the surfaces to receive oil, alkyd, or epoxy based paint until moisture content does not exceed 8% when tested with an electronic moisture-measuring instrument.
 - D. Masonry:** Repair minor holes and cracks with a stiff paste of finish paint and fine sand or vinyl type block filler. Report major or unsightly defects to the Architect for correction. Neutralize all alkali and efflorescence according to paint manufacturer's directions.
 - E. Gypsum Wallboard:** Touch-up minor defects with spackle, sanded smooth and flush. Report other defects as specified.
 - F. Shop Coated Metal:** Degrease and clean of foreign matter. Clean and spot paint field connections, welds, soldered joints, burned, or abraded portions with same material used in shop coats. After complete hardening, sand entire surfaces for coat to follow.

- G. Uncoated Ferrous Metal:** Degrease and clean of dirt, rust, mill scale, and other foreign matter using rotary brushes, solvent, or sandblasting. Remove pits and welding slag, and clean surfaces to bright metal before priming. Apply metal primer not more than three hours after preparation.
 - H. Galvanized and Non Ferrous Metal:** Degrease and clean of foreign matter. Apply specified pretreatment, and immediately apply primer paint.
 - I. Enameled Woodwork:** Sand smooth with grain and dust clean. After priming, putty all nail holes, cracks, or other defects with putty matching color of finish paint. Cover knots and sappy areas with shellac or approved knot sealer. Sand each base coat smooth when dry. Back prime exposed exterior wood or wood type products.
 - J. Transparent Finished Woodwork:** Sand smooth with the grain and dust clean. Repair all defects with filler tinted to match stain or wood color, as required, after first coat of sanding sealer and remove all smears.
 - K. Fixtures, Equipment, and Hardware Items:** Cooperate with other trades and coordinate removal of fixtures, equipment, and hardware as required to perform painting. Items to be removed include, without limitation: signs and graphics; switch and receptacle plates; escutcheons and like plates; all surface-mounted equipment; free-standing equipment blocking access; grilles and louvers at ducts opening into finished spaces; and other items as required and directed.
 - L. Reveals:** In gypsum board, plaster and other surfaces reveals are to be painted to match adjacent color and finish, unless otherwise indicated or selected by the Owner. Obtain approval of the Architect prior to commencing work.
 - M. Back Priming:** Refer to Section 06200 for requirements. Unexposed backside of all exterior siding, wood trim or other wood products shall be back primed and/or finished per manufacturer's recommendations.
 - N. Surfaces Not Mentioned:** Prepare surfaces according to recommendations of the paint manufacturer's and as approved.
- 3.03 **COATS AND COLORS:** The number of paint coats specified to be applied are minimum. Ensure acceptable paint finishes or uniform color, free from cloudy or mottled areas and evident thinness on arises. "Spot" or undercoat surfaces as necessary to produce such results. Tint each coat a slightly different shade of finish color to permit identification. Conform to approved Samples. Obtain approval of each coat before applying next coat; otherwise apply an additional coat over entire surface involved at no additional cost to Owner.
- 3.04 **INTERIOR PAINTING:** Provide finishes as scheduled on Drawings or directed, gloss of finishes as scheduled or, where not scheduled, as designated by the Architect. Enamel for finish shall be of the following glosses:

Gloss Enamel (70 – 89%)	W7600V, SPARTAGLOSS
Semi-Gloss Enamel (41 – 69%)	W603, ECOSHIELD Low Odor, Zero VOC, Or W7500V, SPARTAGLO, Interior / Exterior Modified Copolymer Semi-Gloss Paint
Eggshell Enamel (26 – 40%)	W7400 SPARTASHELL, Interior / Exterior Modified Copolymer Eggshell Paint Low Sheen (10 – 25%) W602, ECOSHIELD, Low Odor, Zero VOC
Or	W7300 SPARTASHEEN, Interior / Exterior Modified Copolymer Low Sheen Paint

A. Flat - Drywall:

1st Coat:	W 420V, WALLTONE, Interior Latex Flat Wall Finish
2nd Coat:	W 420V, WALLTONE, Interior Latex Flat Wall Finish

B. Flat - Concrete Block Masonry:

1st Coat:	SBPR00, SmoothBLOCFIL Premium
2nd Coat:	W 420V, WALLTONE, Interior Latex Flat Wall Finish

C. Enamel - Concrete Block:

1st Coat:	SBPR00, SmoothBLOCFIL Premium
2nd Coat:	Enamel, gloss as scheduled or designated
3rd Coat:	Enamel, gloss as scheduled or designated

D. Enamel - Drywall:

1st Coat	W 102, PROSEAL, Pigmented Interior Sealer
2nd Coat:	Enamel, gloss as scheduled or designated)
3rd Coat:	Enamel, gloss as scheduled or designated

E. Enamel - Wood:

1st Coat:	IKPR00, INTER-KOTE Premium, Int. Modified Copolymer Enamel Under-coater
2nd Coat:	Enamel, gloss as scheduled or designated)
3 rd Coat:	Enamel, gloss as scheduled or designated

F. Flat - Metal: Treat galvanized metal with SC-ME-01 Metal Clean n' Etch

1st Coat:	GAPR00, GALV-ALUM Premium, Primer for galvanized metal
OR	BRPR00, BLOC-RUST Premium, Anti-Corrosive Metal Primer for ferrous metal

2nd Coat: W 420V, WALLTONE, Interior Latex Flat Wall Finish
3rd Coat: W 420V, WALLTONE, Interior Latex Flat Wall Finish

G. Enamel - Metal: Treat galvanized metal with SC-ME-01 Metal Clean n' Etch

1st Coat: GAPR00, GALV-ALUM Premium, Primer for galvanized metal
OR BRPR00, BLOC-RUST Premium, Anti-Corrosive Metal Primer for ferrous metal
2nd Coat: Enamel, gloss as scheduled or designated
3rd Coat: Enamel, gloss as scheduled or designated

3.06 MISCELLANEOUS PAINTING:

A. Weatherstripping or Sound Seals: Paint exposed metal surfaces to match the door frame, whether or not unfinished, furnished with factory prime coat, or factory treated for paint adhesion.

B. Miscellaneous: For any items not specifically shown or specified that require a paint finish, Contractor shall confer with Owner to determine if any additional painting is required, apply 3 coats of paint as directed.

3.07 CLEANING AND TOUCH-UP WORK: Make a detailed inspection of paint finishes after all painting is completed, remove splatterings of paint from adjoining surfaces, and make good all damage that may be caused by such cleaning operations. Carefully touch-up all abraded, stained, or otherwise disfigured painting, as approved, and leave entire painting in first-class condition.

END OF SECTION

SECTION 09955

FIBERGLASS REINFORCED POLYESTER PANELS

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide fiberglass reinforced polyester panels (FRP) complete as indicated, specified and required.

A. Work In This Section: Principal items include:

1. Fiberglass reinforced plastic (FRP) wall panels.
2. Related trim, fasteners, adhesive and accessories.

B. Related Work Not In This Section:

1. Gypsum wallboard.
2. Calking and sealants.
3. Resilient base.

1.02 QUALITY ASSURANCE:

A. Requirements Regulatory Agencies: Comply with applicable codes and ordinances, regulations, references and standards in effect at bid date.

1. A.B.P.A. Product Standards PS 58-73 and PS 59-73.
2. A.H.A. Industry Standard 1-71 (Class I Finish).
3. Federal Specifications LLL-B-805, LLL-B-8106 and LLL-810-B.
4. Underwriters' Laboratories, Inc.
5. Comply with CBC code for Flame Spread Rating, ASTM E84, Flame Spread 175, Smoke Density under 450.
6. Physical Properties:

<u>Property</u>	<u>Test Method</u>	<u>Test Value</u>
Flexural Strength	ASTM D790	19,000 psi
Flexural Modulus	ASTM D790	100,000 psi
Tensile Strength	ASTM D638	7,300 psi
Tensile Modulus	ASTM D638	118,000 psi
Impact Strength	ASTM D256	12.5 ft. lbs/in. notched
Barcol Hardness	ASTM D2583	58
Specific Gravity	ASTM D792	1.8
Thermal Coefficient of Linear Expansion	ASTM D696	1.6 x 10 ⁶ in./in./degree F
Water Absorption	ASTM D570	0.2% in 24 hours at 77 degrees F

- B. Qualifications of Installers:** For this portion of the work, use only installers who are trained in the installation of prefinished hardboard paneling, accessories and trim.

1.03 SUBMITTALS:

- A. Samples:** Submit to Architect for approval 12" x 12" sample of FRP board and 12" length of trim cap. Submit in accordance with Section 01300 Submittals.

- 1.04 PRODUCT HANDLING: Deliver product to job site with all finish surfaces protected against scratches, stains and all damage. Lay panels and trim flat in original containers raised off floor away from moisture.

PART 2 - PRODUCTS

- 2.01 FIBERGLASS REINFORCED POLYESTER (F.R.P.) PANELS: Panels shall be 4' x 8' x 3/32" fiberglass reinforced polyester panels. The panels shall be smooth and white in color. FRP panels shall be installed with 8' with harmonizing moldings, adhesive and sealant as supplied by the Commercial Division, Masonite Corporation, Dover, Ohio. Material must be applied strictly in accordance with the printed installation instructions provided. Approved alternate manufacturers' are Kemlite Corporation or Nudo Products, Inc or Sequentia Inc.

PART 3 - EXECUTION

- 3.01 INSTALLATION: Install per manufacturer's instructions, including sealant in moldings. Prepare all surfaces for proper installation against clean un-textured smooth sanded taped gypsum board. Room temperature during installation must be 60 degrees or above. Place FRP board before vinyl base is installed. Panels shall be flush, level and plumb. All trim and joints shall be level, plumb and true. Use large 4 x 8 panels so as to create no seams in small rooms (10'-0" dimension or less). In larger rooms, coordinate panel seams with Architect. Joints, install paneling with all joint and score lines plumb and in accurate alignment. No horizontal joints will be permitted. Sealant application, apply sealant at edges of panel and paneling and plumbing trim and as recommended by FRP panel and paneling manufacturer for sanitary installation, refer to Section 07900 Calking and Sealants.
- 3.02 CLEAN-UP: Clean panels and trims for final acceptance with products as recommended by manufacturer. Protect from damage until construction is complete. Remove all scrap, debris and packaging from site.

END OF SECTION

SECTION 10010

BUILDING SPECIALTIES

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide building specialties complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Signs.

B. Related Work Not In This Section:

1. Toilet accessories.
2. Concrete substrates.
3. Metal fabrications.
4. Finish carpentry

1.02 SUBMITTALS: Refer to Section 01300 for procedures.

A. Shop Drawings and Samples: Submit for various items as specified hereinafter. Shop materials, finish, characteristics, construction and fabrication details and procedure, layout and erection diagrams, methods of anchorage to building construction, templates for backing or anchorage, and other criteria.

B. Product Data: Submit catalog data for the standard manufactured items and as applicable to shop-fabricated or shop-assembled items.

PART 2 - PRODUCTS

2.01 MANUFACTURE: Refer to Drawings for selections and other recommendations. Use products of only one manufacture throughout for each specialty item specified unless otherwise noted or approved.

2.02 SIGNS: Fabricate and provide signs as detailed on drawings or as selected by Owner. Provide Shop Drawings for Architects approval prior to fabrication. Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Dots shall be spaced 1/10" on center within each cell with 2/10" space between cells. Dots shall be raised 1/40" above background. Refer to CBC Section 1117B.5.6. All signage shall conform to CBC Section 1117B.5 and 1103.2.4.

PART 3 - EXECUTION

3.01 INSTALLATION: Conform to the approved submittals and the various manufacturers instructions.

END OF SECTION

SECTION 10800

TOILET ACCESSORIES

PART 1 - GENERAL

- 1.01 DESCRIPTION: Division 1 applies to this Section. Provide accessories for toilet rooms complete as indicated, specified, and required.
- 1.02 SUBMITTALS:
- A. **Product Data:** Submit the manufacturer's technical Product Data and installation directions.
 - B. **Samples:** Submit such Samples as Architect may request, which will be returned to Contractor. Approved Samples may be installed in the Work.

PART 2 - PRODUCTS

- 2.01 MATERIALS: Accessories as scheduled on Drawings, brushed stainless steel products of Bobrick or Bradley. Refer to Section 01600 regarding substitutions.
- 2.02 TOILET ROOM MIRRORS: Provide Bobrick Series as scheduled on drawings, install where indicated on drawings. Mirror quality 1/4" thick polished plate, ground edges, double-silvered, copper backed, and organic coating, bearing 15-year guarantee against silver spoilage. Provide stainless steel channels as scheduled on drawings and secure with adhesive supplied by mirror manufacturer.

PART 3 - EXECUTION

- 3.01 INSTALLATION: Install accessories square, plumb, and level. Securely anchor by mechanical means only using stainless steel fasteners. Obtain required rough-in and installation templates. Exact locations shall be as indicated or directed by the Architect.

END OF SECTION

SECTION 15000

MECHANICAL

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide all mechanical, plumbing and HVAC systems complete as indicated on drawings, specified, and required.

A. Work In This Section: Principal items include:

1. Complete mechanical systems.
2. Complete plumbing systems
3. HVAC systems

B. Related Work Not In This Section:

1. Electrical connections.
2. Civil connections.

1.02 SUBMITTALS: Refer to Section 01300 for procedures. Submit complete Shop Drawings Section 01300, "Submittals".

PART 2 - PRODUCTS

2.01 MATERIALS: Provide materials and equipment required for completion of work as shown or required on the drawings.

2.02 ACCESSORIES: Provide all hardware, accessories, and miscellaneous items for a complete operational systems.

PART 3 - EXECUTION

3.01 INSTALLATION: All mechanical systems work shall be properly installed in strict compliance with drawings and all Code requirements.

END OF SECTION

SECTION 16000

ELECTRICAL

PART 1 - GENERAL

- 1.01 DESCRIPTION: Division 1 applies to this Section. Provide required electrical systems complete as indicated on drawings, specified, and required by Code.
- A. Work In This Section:** Principal items include:
1. Complete electrical systems.
 2. Complete lighting systems.
- B. Related Work Not In This Section:**
1. Mechanical connections.
- 1.02 SUBMITTALS: Refer to Section 01300 for procedures. Submit complete Shop Drawings Section 01300, "Submittals".
- 1.03 QUALITY ASSURANCE: Conform to the following as applicable:
- A. Certification Labels:** Provide equipment which complies with standards and bears certification labels as follows:
1. Energy Ratings: Provide energy guide labels with energy cost analysis (annual operating costs) and energy information as required by Federal Trade Commission.
 2. UL Standards: Provide equipment with UL labels.
- B. Uniformity:** Provide products of same manufacturer for each type of equipment required. The greatest extent possible, provide equipment by manufacturers that are scheduled on drawings for entire project.
- 1.04 PRODUCT DATA: Submit manufacturer's specifications and installation instructions for each type of equipment, including data indicating compliance and requirements. Submit operating and maintenance instructions for each item of equipment. Provide product cuts for Architect/Owners approval prior to purchasing any equipment.
- 1.05 PRODUCT WARRANTIES: Submit manufacturer's standard written warranty for each item of equipment.
- 1.06 FINISH/COLOR: Provide finish and color as selected by Architect/Owner or shown or scheduled, unless otherwise indicated.

- 1.07 DATA SHEETS: Submit manufacturer's published data sheet indicating rough opening sizes, basic space requirements, and all requirements to Architect/Owner.
- 1.08 PRODUCT DELIVERY, STORAGE, AND HANDLING: Deliver all equipment to the site in unopened factory sealed containers bearing printed name of manufacturer, keep container dry and undamaged.

PART 2 - PRODUCTS

- 2.01 MATERIALS: Provide materials and equipment required for completion of work as indicated on drawings and required by Code and approved by the Architect.
- 2.02 ACCESSORIES: Provide all hardware, accessories, and miscellaneous items for complete operational systems.

PART 3 - EXECUTION

- 3.01 INSTALLATION: All electrical systems work shall be properly installed in strict compliance with drawings and all Code requirements and approval by the Architect.

END OF SECTION

Southeast Library Roof Specifications

General Scope of Work:

Roofing contractor must be certified GAF Master Elite installer and will need to provide proof at time of bid.

Scope of work includes complete tear off and replacement of composition shingle and built up roof covering per specifications. Remove and dispose of all construction waste and trash.

Remove existing shiplap siding at parapet and replace with Hardieplank and Hardietrim per specifications.

Remove and save for re-installation metal wall cap at parapet

Replace all other existing flashings with new, min. 26 ga.

Replacement all piping roof supports with Durablok and accessories per specifications.

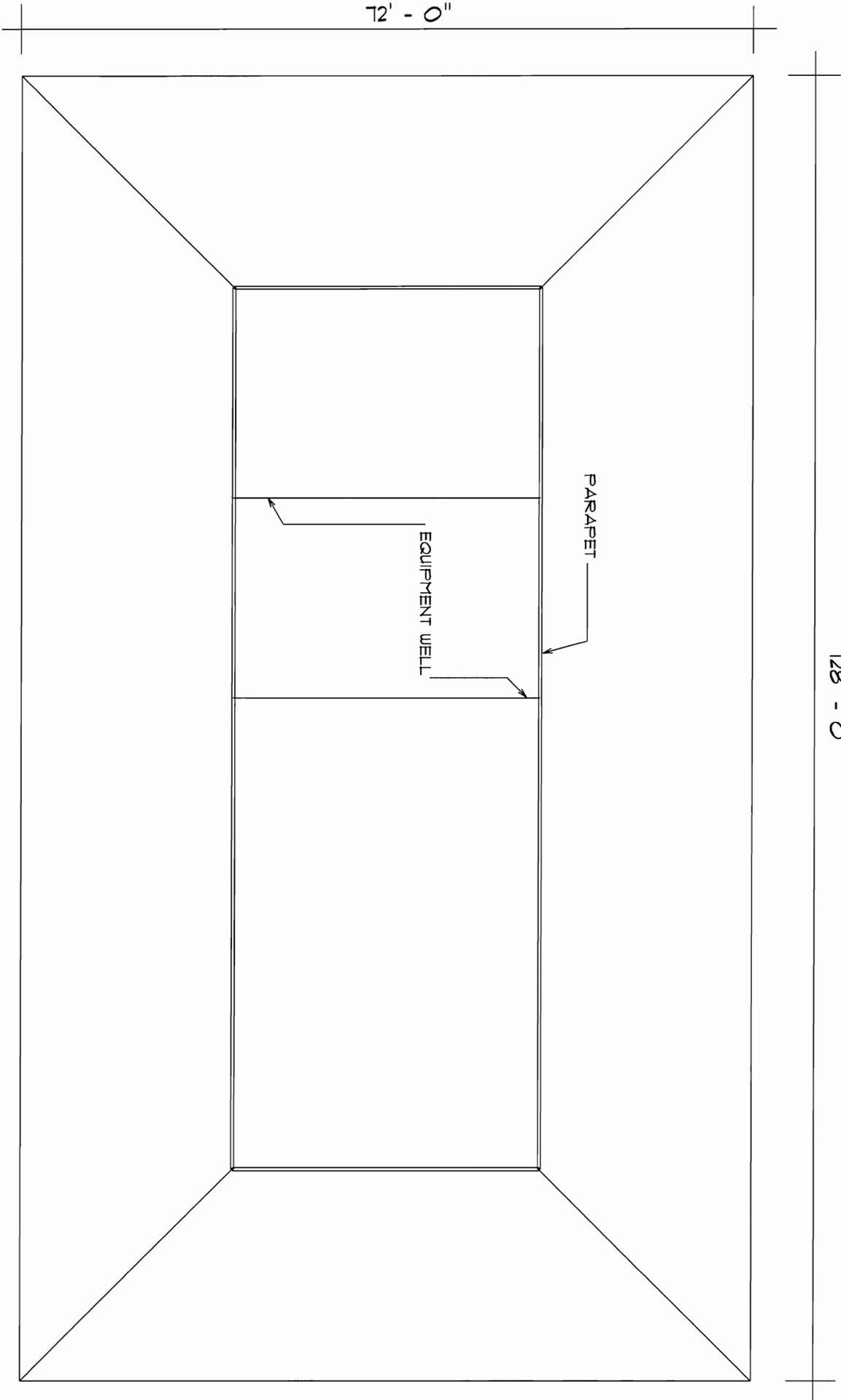
Allow for minimum 10% sheeting replacement.

Expose and repair/replace internal horizontal portion of gutter/downspout system.

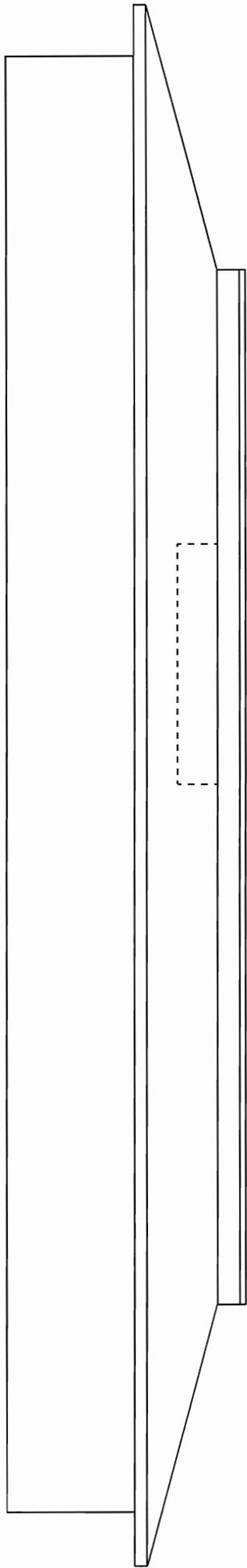
Install pitch pockets per specifications, Chemlink Advanced architectural products, E-curb system.

Provide roof warranties per roof specifications as part of closeout documents.

72' - 0"



128' - 0"





SECTION 07550

MODIFIED BITUMINOUS ROOFING

City of Torrance Library
Well Area

PREPARED BY:

GAF® Architectural Information Services

PROJECT NO: G-12851

Note: GAF® does not practice architecture or engineering. This Design Line is provided as a guide specification and is based on criteria provided to GAF®. GAF® has not observed the jobsite conditions, contract specifications, or other documents and shall not be construed in any manner to be the designer of record.



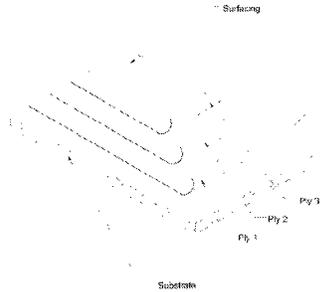
Quality You Can Trust Since 1886...From North America's
Largest Roofing Manufacturer



GSK-21783

**City of Torrance Library
Well Area**

02/11/2013



SPECIFICATION: N-1-2-TGPFR EC

COMPONENT	TYPE	REQUIRED	ATTACHMENT	RATE OF APPLICATION
DECK	Plywood		Per Code	
BASE SHEET	GAFGLAS® #75 Base Sheet ASTM D-4601	One (1) ply	Threaded Cap Nail	Per GAF® requirements
INTERPLY SHEET	RUBEROID® Torch Smooth ASTM D-6222	One (1) ply	Torch Welded	Fully Adhered
SURFACE MEMBRANE	RUBEROID® EnergyCap™ Torch FR ASTM D-6222	One (1) ply	Torch Welded	Fully Adhered
FLASHING MEMBRANE 2WBT	GAFGLAS® #75 Base Sheet ASTM D-4601	One (1) ply	Threaded Cap Nail	8" o.c. in all directions on wood walls
	RUBEROID® EnergyCap™ Torch FR ASTM D-6222	One (1) ply	Torch Welded	Fully Adhered
GUARANTEE	WeatherStopper® Diamond Pledge Guarantee	Ten (10) years		GUARANTEE FEE IS APPLICABLE

**All GAF® and Metalastic® accessories shall be used where applicable.
This system shall be installed by a GAF® Master or Master Select™ Contractor.**

*Note: Each roof has unique requirements. This specification is a graphic representation of products and their installation.
To properly assess specific roofing needs, code approvals, system configurations and warranty eligibility contact Contractor Services.*

This specification shall not waive, supersede, or alter the requirements and recommendations found in the most current GAF® specification manual.

Architectural Information Services 1212 Brai Dr. Port Arthur, TX 77640
Ph: 1-800-522-9224 Fax: 877-271-6588

GAF® RUBEROID® DESIGN LINE
GUIDE SPECIFICATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Asphaltic modified bituminous roofing
 - 2. Insulation
- B. Related Sections
 - 1. Section 06100: Rough Carpentry
 - 2. Section 07620: Sheet Metal Flashing and Trim
 - 3. Section 15430: Plumbing Specialties

1.02 REFERENCES

- A. Factory Mutual (FM Global) - *Approval Guide*
- B. Underwriters Laboratories (UL) - *Roofing Systems and Materials Guide* (TGFU R1306)
- C. American Society for Testing and Materials (ASTM) - *Annual Book of ASTM Standards*
- D. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - *Architectural Sheet Metal Manual*
- E. Asphalt Roofing Manufacturers Association (ARMA)
- F. National Roofing Contractors Association (NRCA)
- G. American Society of Civil Engineers (ASCE)

1.03 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) *Roofing and Waterproofing Manual* for definitions of roofing terms related to this section.

1.04 PERFORMANCE REQUIREMENTS

- A. Provide an installed roofing membrane and base flashing system that does not permit the passage of water, and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.
- B. GAF® shall provide all primary roofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.

1.05 SUBMITTALS

- A. Product Data: Provide product data sheets for each type of product indicated in this section.
- B. Shop Drawings: Provide manufacturers standard details and approved shop drawings for the roof system specified.
- C. Samples: Provide samples of insulation(s), fasteners and roll goods for verification of quality.

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- D. Certificates: Installer shall provide written documentation from the manufacturer of their authorization to install the roof system, and eligibility to obtain the warranty specified in this section.

1.06 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: GAF® shall provide a roofing system that meets or exceeds all criteria listed in this section.
- B. Installer's Qualifications:
 - 1. Installer shall be classified as a *Master* or *Master Select™* contractor as defined and certified by GAF®.
- C. Source Limitations: All components listed in this section shall be provided by a single manufacturer or approved by the primary roofing manufacturer.
- D. Final Inspection
Manufacturers representative shall provide a comprehensive final inspection after completion of the roof system. All application errors must be addressed and final punch list completed.

1.07 PRE-INSTALLATION CONFERENCE

- A. Prior to scheduled commencement of the roofing installation and associated work, conduct a meeting at the project site with the installer, architect, owner, GAF® representative and any other persons directly involved with the performance of the work. The installer shall record conference discussions to include decisions and agreements reached (or disagreements), and furnish copies of recorded discussions to each attending party. The main purpose of this meeting is to review foreseeable methods and procedures related to roofing work.

1.08 REGULATORY REQUIREMENTS

- A. All work shall be performed in a safe, professional manner, conforming to all federal, state and local codes.

1.09 DELIVERY, STORAGE AND HANDLING

- A. Deliver all roofing materials to the site in original containers, with factory seals intact. All products are to carry either a GAF® or BMCA® label.
- B. Store all pail goods in their original undamaged containers in a clean, dry location within their specified temperature range.
- C. Store roll goods on end on pallets in a clean, dry, protected area. Take care to prevent damage to roll ends or edges. Do not double stack modified bitumen products.
- D. Do not expose materials to moisture in any form before, during, or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.
- E. Remove manufacturer supplied plastic covers from materials provided with such. Use "breathable" type covers such as canvas tarpaulins to allow venting and protection from weather and moisture. Cover and protect materials at the end of each work day. Do not remove any protective tarpaulins until immediately before the material is to be installed.
- F. Materials shall be stored above 55°F (12.6°C) a minimum of 24 hours prior to application.

1.10 PROJECT CONDITIONS

- A. Weather

**GAF® RUBEROID® DESIGN LINE
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1. Proceed with roofing only when existing and forecasted weather conditions permit.
2. Ambient temperatures must be above 45°F (7.2°C) when applying hot asphalt or water based adhesives.

1.11 WARRANTY

- A. Provide Manufacturer's standard WeatherStopper® Diamond Pledge™ Guarantee with single source coverage* and no monetary limitation, where the manufacturer agrees to repair or replace components in the roofing system, which cause a leak due to a failure in materials or workmanship.
 1. Duration: Ten (10) years from the date of completion.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. GAF® - 1361 Alps Road, Wayne, NJ 07470

2.02 BASE / PLY SHEETS

- A. Heavyweight asphalt coated glass fiber base sheet: Conforms to or exceeds requirements of ASTM D 4601, Type II, UL Type G2 BUR, and Federal Spec SS-R-620B Type II. Each roll contains three (3) squares (320 sq. ft.) of material, approximately 39.375" x 97.5' (1 m x 29.7 m); 68 lbs. (30.8 kg), **GAFGLAS® #75** base sheet.
- B. Smooth surfaced, resilient, asphalt modified bitumen membrane containing a core of non-woven polyester mat coated with weather resistant, APP polymer-modified asphalt. Conforms to or exceeds requirements of ASTM D 6222 Type I Grade S. Each roll contains one square of material, approximately 39.625" x 32.25' (1 m x 9.8 m), 85.4 lbs. (38.7 kg) **Ruberoid® Torch Smooth** roof membrane.

2.03 MEMBRANE MATERIALS

- A. ENERGY STAR listed, fire resistant, coated granule surfaced modified bitumen membrane containing a core of non-woven polyester mat coated with weather resistant, APP polymer-modified asphalt. Conforms to or exceeds the requirements of ASTM D 6222 Type II Grade G. Each roll contains one (1) square of material, approximately 39.5" x 32.4' (1 m x 10.3 m), 106 lbs. (48.1 kg) **Ruberoid® EnergyCap™ Torch Plus FR** roofing membrane.

2.04 FLASHING MATERIALS

- A. Heavyweight asphalt coated glass fiber base sheet: Conforms to or exceeds requirements of ASTM D 4601, Type II, UL Type G2 BUR, and Federal Spec SS-R-620B Type II. Each roll contains three (3) squares (320 sq. ft.) of material, approximately 39.375" x 97.5' (1 m x 29.7 m); 68 lbs. (30.8 kg), **GAFGLAS® #75** base sheet.
- B. ENERGY STAR listed, fire resistant, coated granule surfaced modified bitumen membrane containing a core of non-woven polyester mat coated with weather resistant, APP polymer-modified asphalt. Conforms to or exceeds the requirements of ASTM D 6222 Type II Grade G. Each roll contains one (1) square of material, approximately 39.5" x 32.4' (1 m x 10.3 m), 106 lbs. (48.1 kg) **Ruberoid® EnergyCap™ Torch Plus FR** roofing membrane.

2.05 ACCESSORIES

- A. Mechanical Fasteners
 1. **Threaded Cap Nail:** Annular-threaded electro-galvanized with yellow di-chromate coating, with 1" (25 mm) round or square cap, as manufactured by the Simplex Nail Corporation.

**GAF® RUBEROID® DESIGN LINE
GUIDE SPECIFICATION**

- B. Standard Vents
1. A spun aluminum vent, pre-flashed with modified bitumen designed to waterproof soil pipes and roofing protrusions. The **Standard MVent**, by MWeld®.
NOTE: Not for use over active pipes that emit steam or excessive moisture vapor, condensation may occur. Not for use over boiler or heater/furnace vent pipes.
- C. Adjustable Vents
1. A two-piece roof-flashing unit consisting of a pre-flashed spun aluminum base and a flexible upper boot, allowing for waterproofing of tall or awkward roof protrusions. The **Adjustable MVent**, by MWeld®.
- D. Plumbing Vents
1. A pre-flashed with modified bitumen membrane and is designed to waterproof vent pipes. It can be used as a pipe cover to replace finger and cap flashing on standard vent pipe details. The **Pre-Flashed Plumbing Vent**, by MWeld®.
- E. Drains
1. A spun aluminum (or copper) roof drain with gravel guard, strainer cap, and waterproofing plumbing seal attached. Pre-flashed with modified bitumen and available in full and insert sizes to accommodate new construction and retrofit applications. The **MDrain**, by MWeld®.
 2. A Pre-flashed metal through-wall roof drain designed for easy installation to aid in quick lateral removal of water. The **Mscupper**, by MWeld®.
- F. Sealant Pans
1. A structural urethane outer shell, bonded to the roof surface, filled with a urethane rubber sealant. The urethane sealant conforms to the shape of any roof penetration through a roof surface to protect the roof system from moisture. The **M-Curb** and **M-Thane**, by MWeld®.
- G. Expansion Joint Covers
1. Factory fabricated assemblies used to accommodate three-dimensional joints in a roof structure. Heavy reinforced flexible cover with a flexible flame retardant foam bellows for support. Nailing flanges conform to curb irregularities. The **Metalastic® Expansion Joint Cover**, by BMCA®.
- H. Gravel Guard
1. Three-piece fascia system with roof flange design that creates water and wind proof seals at the building perimeter. The **Gravel Guard MB**, by BMCA®.
- I. **EnergyCote™ Coating**, a brilliant white, water based, low VOC, highly reflective elastomeric coating which cures to form a seamless rubber membrane. It has been specifically designed to treat seams, laps, flashings and other edges and details in reflective cap sheet products such as EnergyCap™. Designed to add reflectivity and protect areas of asphalt bleed-out on white reflective asphalt roll roofing to give a uniform, brilliant white finish across the whole roof area.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that the surfaces and site conditions are ready to receive work.
- B. Verify that the deck is supported and secured.
- C. Verify that the deck is cleaned and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters.

GAF® RUBEROID® DESIGN LINE
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- D. Verify that the deck surfaces are dry and free of ice or snow.
- E. Verify that all roof openings, curbs, pipes, sleeves, ducts, vents or other penetrations through the roof are solidly set, and that all flashings are tapered.

3.02 SUBSTRATE PREPARATION

- A. Plywood Deck
 1. Plywood sheathing must be exterior grade, minimum 4 ply, and not less than 15/32" (12 mm) thick.
 2. Preservatives or fire retardants used to treat the decking must be compatible with roofing materials.
 3. The deck must be installed over joists that are spaced 24" (61 cm) o.c. or less.
 4. The deck must be installed so that all four sides of each panel bear on and are secured to joist and cross blocking. "H" clips are not acceptable.
 5. Panels must be installed with a 1/8" to 1/4" (3mm – 6mm) gap between panels and must match vertically at joints to within (1/8" (3mm).
 6. Decking should be kept dry and roofed promptly after installation.
 7. Light metal wall ties or other structural metal exposed on top of the wood deck shall be covered with one ply of a heavy roofing sheet, such as Stratavent® Eliminator™ Nailable Base Sheet, extending 2"-6" (5.1 cm – 15.2 cm) beyond the metal in all directions. Nail in place before applying the base ply.
 8. Tape and staple fastening systems may be used on wood decks when they comply with local building codes.
 9. Attach an acceptable base sheet through flat metal caps or use nails with attached 1" (25 mm) square or round metal caps that have a minimum withdrawal resistance of 40 pounds each (178 N).

3.03 INSTALLATION - GENERAL

- A. Install GAF®'s Ruberoid® roofing system according to all current application requirements in addition to those listed in this section.
- B. GAF® Ruberoid Specification #: N-1-2-TGPPFR EC
- C. When the slope of the roof is 1/2" per foot or greater, install all plies parallel with the slope of the roof, and install intermediate wood nailers as required for the specific roof slope. Plies must extend over ridges and nailed on 6" centers.
- D. Start the application of membrane plies at the low point of the roof or at the drains, so that the flow of water is over or parallel to, but never against the laps.

3.04 BASE SHEET

- A. Roll the base sheet out over the deck and allow it to relax. Lap the base sheet so the flow of water is over or parallel to, but never against the laps.
- B. Lap the base sheet 2" (5.1 cm), and 4" (10.2 cm) on the ends. Keeping the base sheet taut, push out all wrinkles and buckles ahead as fastening proceeds.
- C. Turn base sheet up to the top of the cant.
- D. Stagger adjacent end laps a minimum of 18" (45.7 cm).
- E. A minimum FMRC 1-60 attachment is recommended. Refer to FMRC Approval Guide for FM Fastening patterns. Factory Mutual requires fastener density increases in perimeter and corner zones for FM 1-60 and FM 1-90 or greater. Refer to FM Loss Prevention Data Sheets 1-7, 1-28, 1-29 and 1-49.

GAF® RUBEROID® DESIGN LINE
GUIDE SPECIFICATION

Note: When fastening base sheets using screws and plates without insulation, the plate must be of a design that allows it to lie flat on the deck.

3.05 CAP SHEET

- A. The surface over which the membrane is to be installed must be clean, smooth, dry and prepared in accordance with article 3.02 "Substrate Preparation". Do not apply membrane directly to a fresh asphalt glaze or flood coat, or over base plies with excessive asphalt mopping bleed out at laps.
- B. For slopes 3/4 " per foot (6.2 cm per meter) and over, membrane must be run parallel to the roof slope and back nailed in accordance with GAF® steep slope application requirements. On slopes less than 3/4" per foot (6.2 cm per meter), install cap sheet perpendicular to the slope.
- C. Cap sheet application: Install full width cap sheets, lapping 3" (7.6 cm) on the sides and 6" (15.2 cm) on ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) apart. All side and end laps must be staggered from underlying plies.
- D. Never apply membrane by any method except welding with a propane torch or other equipment specifically designed for application of torchable modified bitumen.
- E. The coiled membrane must be unrolled approximately 10 ft. (3 meters), and aligned. The propane torch flame is then applied uniformly across the exposed back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. A complete burn-off of all release films is necessary. Avoid overheating, which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an "L", applying about 75% of the heat to the membrane and 25% to the substrate or underlying plies including the lap area of the previously installed courses.) The membrane is slowly unrolled as heat is applied to ensure proper adhesion. When complete, re-roll the opposite end of the membrane and install in the same manner.
- F. A minimum 3/8" (10 mm) asphalt flow-out must be obtained at all seam areas. Dry laps are not acceptable. To ensure the proper 3/8" (10mm) flow of bitumen at the seam areas, a roller may be used. Roller application should follow behind the torch no more than 4 ft. (1.2 m) nor less than 3 ft. (0.91 m) to be sure that the membrane will be at the proper temperature to produce proper flow. Hand rollers or "walking-in the seam" methods are also acceptable. Check all seams for full and uniform adhesion. Un-adhered seams must be lifted with a heated trowel and resealed by lightly torching the seam area.
- G. (Optional) Matching granules may be broadcast into the modified bitumen bleed out at seams while hot to enhance the finished appearance of the membrane.
- H. All end laps must be staggered a minimum of 18" (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of membrane must be installed over the end laps. End laps, flashing sheets and other seams formed over granule surfaces require pre-heating of the top surface of the underlying granule surface membrane to a point where the granules just begin to sink into, and the modified bitumen compound comes up through the granules to ensure proper seam construction and adhesion.
- I. All laps must be parallel or perpendicular to the slope of the roof such that the flow of water is never against the lap.
- J. Install full width cap sheet, lapping 3" (7.62 cm) on the sides and 4" (10.2 cm) on ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) apart. Where installed over base sheet, stagger ply sheet side and end laps from underlying plies.
- K. Membranes must not be applied during adverse weather or without precautionary measures in temperatures below 45°F (7.2°C). Contact GAF® Contractor Services for details.

GAF® RUBEROID® DESIGN LINE
GUIDE SPECIFICATION

- L. If damage by other trades or any inadvertent damage should occur to the EnergyCap™ product during installation, and for aesthetic purposes only, an additional fog coat of EnergyCote™ coating can be applied to the sheet at a rate of ½ to 1 gallon per 100 sq ft.

3.06 BITUMINOUS BASE FLASHINGS

- A. Install GAF® base flashing specification 2WBT EC over all cant strips, horizontal to vertical transitions, roof edges and roof penetrations. Flashings are to be secured in accordance with current GAF® application guidelines.
- B. Nailable curbs and walls must be covered with a layer of approved GAFGLAS® Base Sheet or backer ply fastened 8" (20.3 cm) o.c. in all directions with approved fasteners. All vertical laps shall be 4" (10.2 cm). Base sheet or backer ply must extend out onto the field of the roof as shown in the applicable GAF® construction detail.
- C. Prime all metal and masonry surfaces with asphalt primer, and allow adequate drying time prior to adhering flashing plies.
- D. Backer plies installed over masonry or other non-nailable substrates must be cut into manageable lengths to ensure adequate adhesion to the cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4" (10.2 cm). Backer plies shall extend onto the field of the roof as shown in the applicable GAF® construction detail.
- E. The finished ply of base flashing shall be run vertically to provide a selvage edge that will aid in achieving proper adhesion at the 3" (7.6 cm) vertical laps. If the sheet is run horizontally, the vertical laps must be a minimum of 6" (15.2 cm) and the selvage edge must be removed from the sheet or fully covered by the counterflashing. The finished flashing ply must extend out onto the field of the roof as shown in the applicable GAF® construction detail, and must be extended a minimum of 4" (10.2 cm) beyond the edge of the prior flashing plies. The flashing must be soundly adhered to the parapet, cant area and roof surface to result in a minimum void, non-bridging construction.
- F. Base flashing heights must be a minimum of 8" (20.3 cm) and a maximum of 24" (61.0 cm) above the roofline.
- G. Corner membrane flashings, such as "bow ties" for outside corners and "footballs" for inside corners or other membrane reinforcements are required to ensure that base flashing corners are sealed at cant areas. An alternate method of corner reinforcing is to install a smooth MB membrane reinforcement piece on the prepared corner substrate prior to final surfacing membrane. Refer to MB Flashing Details section of the *GAF® Application and Specifications Manual*.
- H. After completion, all membrane to membrane side and end laps adhered with CA 103 adhesive must be sealed with a bead of Matrix™ 201 System Pro Cement.
- I. For gravel surfaced roof systems, install a two ply strip-in along the lower edge of installed Lexsucu flashing at transition to field membrane with an 8" (20.3 cm) and 12" (30.5 cm) wide ply of Ply 4 or Ply 6 felt, centered over the lap and set in solid moppings of hot asphalt or trowelings of Matrix 203 or 204 flashing cement.
- J. For mineral surfaced roof systems, strip-in lower edge of Lexsucu flashing with an 8" (20.3 cm) wide ply of base sheet followed with a 12" (30.5 cm) wide ply of SBS granule surfaced field membrane set in solid moppings of hot asphalt or trowelings of Matrix 203 or 204 flashing cement.
- K. Mechanically fasten top edge of Lexsucu flashing 8" (20.3 cm) o.c. with termination bar and approved fasteners. Lexsucu Metal Edge Flashing may be fastened along the top edge through factory applied metal edge strip and does not require installation of additional termination bar.

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GUIDE SPECIFICATION

- L. All base flashings must be counterflashed. Install metal counterflashing or approved wall covering to extend a minimum of 4" (10.12 cm) below the top edge of the installed Lexuco flashing.

3.07 PENETRATIONS

- A. Horizontal penetrations shall be flashed with M-Curbs filled with M-Thane sealant, then coated with Topcoat® Flexseal.
- B. Vertical penetrations shall be flashed with Topcoat® Flashing Fabric embedded between two coats of Topcoat® Flexseal.

3.08 SHEET METAL

- A. Metal should not be used as a component of base flashing. Because of the high coefficient of expansion of sheet metals and the large temperature changes that can be experienced on a roof, sheet metal or exposed metal components must be isolated from the waterproofing components of the roofing and flashing system as efficiently as possible to prevent the metal from splitting the membranes.
- B. All metal edge details scheduled to be included in the **Edge to Edge Coverage** of the Diamond Pledge™ Guarantee must be submitted and approved in writing by the manufacturer prior to project commencement.
- C. When it is unavoidable to use metal in the roofing system (i.e., lead flange at drains, gravel stops), treated wood nailers and insulation stops, 1" (25 mm) wider than the metal flange, should be provided for metal flange attachment. Metal flanges must always be set on top of the roof membrane with modified trowel grade cold adhesive applied material for SBS roof systems. The metal flange is then sealed using the applicable construction detail to meet applicable guarantee requirements. Metal accessories (gravel stops, counter flashing, etc.) should be 16 oz. (0.56 mm) copper, 24 gauge (0.71 mm) galvanized or stainless steel, 2 1/2 to 4 lb (1.1-1.8 kg) lead, or 0.032" (0.81 mm) aluminum.
- D. Fabricate and install all sheet metal materials as shown in applicable construction details. Refer to SMACNA (Sheet Metal and Air Conditioning Contractors National Association, Inc.) for guidance on sheet metal treatments not addressed in this specification.
- E. Clean metal and apply asphalt primer to all sheet metal surfaces that will come into contact with asphalt or other bituminous materials; allow the primer adequate time to dry.
- F. Use fastener types compatible with the sheet metal type.
 - 1. Copper or lead-coated copper: use copper or bronze fasteners.
 - 2. Lead and galvanized steel: use galvanized or cadmium-plated sheet fasteners.
 - 3. Aluminum: use aluminum fasteners.
 - 4. Stainless steel: use stainless steel fasteners.
- G. Metal counter-flashing shall have a minimum 4" (10.2 cm) face with a drip lip. The bottom edge of the counterflashing shall cover the roofing membrane and/or base flashing by a minimum of 4" (10.2 cm). Metal counter flashing used for masonry walls, wooden walls, or through wall metal flashings should be a two piece design to allow for installation and later removal. Metal counter-flashings for stucco, EIFS, wood siding or similar materials should be designed appropriately, such as "Z" type flashing. End joints shall be lapped 3" (7.6 cm) or more. Adequate fasteners must be provided to secure against wind forces. Skirt fasteners shall be watertight.
- H. Metal termination bars shall be a minimum of 1/10" (3 mm) thick x 1" (25 mm) wide with preformed sealant edge lap. Bar should have 1/4" (6 mm) x 3/8" (10 mm) slotted holes on 4" (10.2 cm) centers to facilitate mechanical anchorage.

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Note: Termination bars are not suitable in all base flashing and wall flashing conditions. Termination bars may only be used in conjunction with an appropriate counter-flashing extending a minimum of 4" (10.2 cm) below the termination bar.

- I. Metal flanges for gravel stops, eave strips, and pitch pockets to be used in conjunction with roofing shall be primed (both sides), set in modified trowel grade cold adhesive applied material for SBS roof systems. Flanges shall be a minimum of 3 1/2" (8.9 cm) wide for gravel stops or eave strips and 4" (10.2 cm) wide for projections and extensions through the roof. The gravel stop lip should be at least 3/4" (19 mm) high. Eave strip lips shall be at least 3/8" (10 mm) high. Provisions must be made for securing the skirt to the face of the wall. This may be a wood nailer strip for masonry and metal construction. In all cases, gravel stop and eave strip nailer should be fastened to the deck or deck system with adequate resistance against wind forces.
- J. Stacks shall have metal sleeve flashing a minimum of 8" (20.3 cm) high. Pitch pockets for brackets, supports, pad-eyes, etc., shall have a 4" (10.2 cm) minimum height metal sleeve.
- K. On re-roofing projects, provisions shall be made for reinstallation of existing sheet metal duct work, equipment, coping metal and counter-flashing removed in conjunction with the new work. Also, provide for cleaning and repairing of existing defective sheet metal, and replacement of missing and irreparable sheet metal to match existing types. Light gauge sheet metal flashings which are incorporated into the Ruberoid® roof system are not suitable for re-use and must be replaced with new material.
- L. Conduits and piping such as electrical and gas lines must be set on wood blocking or some other form of support. Wood blocking/supports must be set on pads constructed of an additional layer of roof membrane material.

3.09 WALKWAYS

- A. Walkways for normal rooftop traffic may be constructed from two plies of modified bituminous membrane of the same type as the field of the roof. This type of walkway is not for sidewalk or patio-type use.
- B. Construct walkways by solidly adhering a first ply of smooth surfaced membrane to the field of the roof followed by a granule surfaced membrane to the surface of the first ply.
- C. Walkway sections should be no longer than 10' (3 m), with a 6" (15.2 cm) minimum gap between each section to allow for drainage.

3.10 ROOF PROTECTION

- A. Protect all partially and fully completed roofing work from other trades until completion.
- B. Whenever possible, stage materials in such a manner that foot traffic is minimized over completed roof areas.
- C. When it is not possible to stage materials away from locations where partial or complete installation has taken place, temporary walkways and platforms shall be installed in order to protect all completed roof areas from traffic and point loading during the application process.
- D. Temporary tie-ins shall be installed at the end of each workday and removed prior to commencement of work the following day.

3.11 CLEAN-UP

- A. All work areas are to be kept clean, clear and free of debris at all times.
- B. Do not allow trash, waste, or debris to collect on the roof. These items shall be removed from the roof on a daily basis.

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- C. All tools and unused materials must be collected at the end of each workday and stored properly off of the finished roof surface and protected from exposure to the elements.
- D. Dispose of or recycle all trash and excess material in a manner conforming to current EPA regulations and local laws.
- E. Properly clean the finished roof surface after completion, and make sure the drains and gutters are not clogged.
- F. Clean and restore all damaged surfaces to their original condition.

END OF SECTION

GAF ASPHALT SHINGLE SPECIFICATION



SECTION 07310

ASPHALT SHINGLE ROOFING

GAF® DESIGN LINE

City of Torrance Library

PREPARED BY:

GAF® Architectural Information Services

PROJECT NO.: S-12850

Note: GAF® does not practice architecture or engineering. This Design Line is provided as a guide specification and is based on criteria provided to GAF®. GAF® has not observed the jobsite conditions, contract specifications, or other documents and shall not be construed in any manner to be the designer of record.

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Rev 01/13



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Architectural Information Services 1212 Brai Dr. Port Arthur, TX 77640
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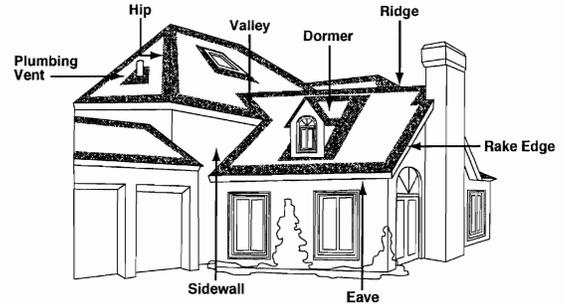
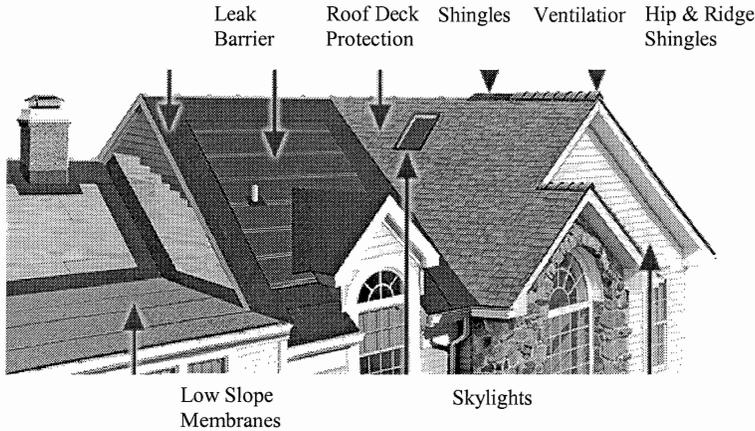
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City of Torrance Library

2/13/2013

Components

Leak Barrier Locations



TIMBERLINE[™] ULTRAHD[™]
 LIFETIME HIGH DEFINITION[®] SHINGLES

COMPONENT	TYPE / MODEL	REQUIRED	ATTACHMENT
DECK	Plywood	Per Code	Per Code
LEAK BARRIER	Weather Watch [®] Leak Barrier	Valleys, eaves, rake edges and flashing areas	Self Adhered
ROOF DECK PROTECTION	TigerPaw [™] Roof Deck Protection	Entire deck	Nails – Per Code
STARTER STRIP	ProStart [™] Starter Strip	Eaves & rake edges	Nails – Per Code
SHINGLES	Timberline [®] Ultra HD [™] Lifetime High Definition [®] Shingles	Entire Deck	Nails – Per Code
VENTILATION	Cobra [®] Ridge Vent	Per Code	Nails – Per Code
HIP & RIDGE SHINGLES	10" RidgeGlas [™] Ridge Cap Shingles	At all hips and ridges	Nails – Per Code
GUARANTEE	GAF [®] Weather Stopper [®] Golden Pledge [™] Ltd Warranty		

Note: "Each roof has unique requirements and as such may require a specific system configuration and application. This specification is a guideline for products and their application. To properly assess specific roofing needs, insurance requirements, code approvals, system configuration and eligible warranty contact technical services"

This specification shall not waive, supersede, or alter the requirements and recommendations found in the most current GAF[®] Roofing Materials specification manual and these requirements and recommendations found in said manual must be followed when applying GAF[®] roofing materials.

GAF ASPHALT SHINGLE GUIDE SPECIFICATION

PART I GENERAL

1.01 SECTION INCLUDES

- A. Asphalt roofing shingles.
- B. Leak barrier and roof deck protection.
- C. Metal flashing associated with shingle roofing.
- D. Attic ventilation.

1.02 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Framing, wood decking, and roof sheathing.
- B. Section 07620 - Flashing and Sheet Metal: Sheet metal flashing not associated with shingle roofing; gutters and downspouts.
- C. Section 08630 - Unit Skylights: Skylights

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM) - Annual Book of ASTM Standards
 - 1. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 3. ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction.
 - 4. ASTM D 2218 – Impact Resistance of Prepared Roof Covering Materials.
 - 5. ASTM D 3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
 - 6. ASTM D 3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
 - 7. ASTM D 3462 – Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules.
 - 8. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
 - 9. ASTM D 7158 - Standard Test Method for Wind-Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method).
- B. Underwriters Laboratories (UL) - Roofing Systems and Materials Guide (TFWZ.R21)
 - 1. UL 790 - Tests for Fire Resistance of Roof Covering Materials.
 - 2. UL 997 - Wind Resistance of Prepared Roof Covering Materials.
 - 3. UL 2218 – Impact Resistance of Prepared Roof Coverings Materials.
- C. Asphalt Roofing Manufacturers Association (ARMA)
- D. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
- E. National Roofing Contractors Association (NRCA)
- F. American Society of Civil Engineers (ASCE).
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

GAF ASPHALT SHINGLE GUIDE SPECIFICATION

- G. U.S. Green Building Council (USGBC)
- 1.04 DEFINITIONS
 - A. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.
- 1.05 SUBMITTALS
 - A. Submit copies of GAF product data sheets, detail drawings and samples for each type of roofing product.
- 1.06 QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Provide all primary roofing products, including shingles, underlayment, leak barrier, and ventilation, by a single manufacturer.
 - B. Installer Qualifications: Installer must be approved for installation of all roofing products to be installed under this section.
- 1.07 REGULATORY REQUIREMENTS
 - A. Provide a roofing system achieving an Underwriters Laboratories (UL) Class A fire classification.
 - B. . Install all roofing products in accordance with all federal, state and local building codes.
 - D. All work shall be performed in a manner consistent with current OSHA guidelines.
- 1.08 PREINSTALLATION MEETING
 - A. General: For all projects in excess of 250 squares of roofing, a pre-installation meeting is strongly recommended.
 - B. Timing: The meeting shall take place at the start of the roofing installation, no more than 2 weeks into the roofing project.
 - C. Attendees: Meeting to be called for by manufacturer's certified contractor. Meeting's mandatory attendees shall include the certified contractor and the manufacturer's representative. Non-mandatory attendees shall include the owner's representative, architect or engineer's representative, and the general contractor's representative.
 - D. Topics: Certified contractor and manufacturer's representative shall review all pertinent requirements for the project, including but not limited to, scheduling, weather considerations, project duration, and requirements for the specified warranty.
- 1.09 DELIVERY, STORAGE, AND HANDLING
 - A. Store all products in manufacturer's unopened, labeled packaging until they are ready for installation.
 - B. Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in direct sunlight.
 - C. Store bundles on a flat surface. Maximum stacking height shall not exceed GAF's recommendations. Store all rolls on end.
 - D. Store and dispose of solvent-based materials in accordance with all federal, state and local regulations.
- 1.10 WEATHER CONDITIONS
 - A. Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with GAF's recommendations
- 1.11 WARRANTY

GAF ASPHALT SHINGLE GUIDE SPECIFICATION

- B. Provide to the owner a **GAF® WeatherStopper® Golden Pledge® Ltd Warranty** covering:
1. Roofs installed by a Certified GAF Master Elite™ Contractor only.
 2. Manufacturing defects: 100% coverage for materials and labor for:
 - a Single family detached homes owned by individuals - the first 50 years non-prorated, then 20% thereafter.
 - b Any other type of owner or building – 40 years with the first 20 years non-prorated.
 3. Workmanship errors: 100% coverage for workmanship errors for:
 - a Single family detached homes owned by individuals - the first 25 years for after installation.
 - b Any other type of owner or building - 20 years.
 4. Roof system NOT installed over an existing roof, all existing roof materials must be removed to the deck.
 5. Full roof installations (Roofs installed on portions of buildings do not qualify) using the following GAF products.
 - a You must use GAF Roof Deck Protection.
 - b You must use eligible GAF Leak Barrier in valleys and around dormers, sidewalls, firewalls, chimneys, plumbing vents, and skylights. In the North, leak barriers must be used at all eaves at least 24" inside warm wall.
 - c You must use GAF pre-cut starter strip products (only those with factory applied adhesive) at the eaves. Note: To obtain bonus wind coverage, you must use GAF pre cut starter strip products (with factory applied adhesive) at the eaves and rakes and you must install each shingle using 6 nails. For Miami Dade County Florida, no adhesive on rakes. You must cement the starter strip in and nail along the rake.
 - d You must use eligible COBRA® ventilation with adequate intake ventilation. Master Flow® exhaust ventilation products can be substituted only if COBRA® ridge ventilation cannot be installed due to a structure's architecture. In any event, adequate ventilation should meet the following requirements:
 - 1) Minimum net free ventilation area of 1 sq ft per 150 sq ft of ceiling area is required. When intake vents are located at the eaves and exhaust vents are located near the roof's peak (in a properly balanced system) for maximum air flow, ventilation may be reduced to 1 sq ft per 300 sq ft. If these standards are not met, GAF cannot be responsible for damage caused by inadequate ventilation.
 - e You must use eligible GAF roofing shingles.
 - f You must use GAF Ridge Cap Shingles or shingles that correspond to the shingle product you are installing.
 - g New metal flashings must be installed. Metal drip edge must be used at eaves and is recommended at rake edges.
 6. In addition to the requirements listed above, you installer must register and pay for this warranty. On projects that total more than 250 squares, the permanent Golden Pledge® Ltd Warranty will be issued only if the project passes GAF's final inspection. GAF reserves the right to withhold the warranty if the roof has not been installed according to GAF's written application instructions. GAF also strongly recommends

GAF ASPHALT SHINGLE GUIDE SPECIFICATION

that your Master Elite® Contractor schedule a start-up and at least one interim inspection on projects of 250 squares or more by contacting GAF at least three weeks prior to the start of roof work.

PART II PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer: GAF, 1361 Alps Rd. Wayne NJ 07470. Tel: 1-973-628-3000.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 SHINGLES

- A. Super-heavyweight, granule surfaced, self sealing asphalt shingle with a strong fiberglass reinforced Micro Weave® core and StainGuard® protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules. Architectural laminate styling provides a wood shake appearance with a 5 5/8 inch exposure. Features GAF®'s patented High Definition® color blends and enhanced shadow effect. . UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; CSA A123.5-98; AC438; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval. **Timberline® Ultra HD** Lifetime High Definition Shingles, by GAF®.

2.03 HIP AND RIDGE SHINGLES

- A. Distinctive self sealing hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 31 lineal feet (9.45m) with an 8 inch (203mm) exposure. **Ridglass™ 10"** Ridge Cap Shingles by GAF.

2.04 STARTER STRIP

- A. Self-sealing starter shingle designed for all roof shingles. Each bundle covers approx. 120 lineal feet (36.58m). **ProStart™ Starter Strip** by GAF.

2.05 LEAK BARRIER

- A. Self-adhering, self sealing, bituminous leak barrier surfaced with fine, skid-resistant granules. Approved by UL, Dade County, ICC, State of Florida and Texas Department of Insurance. Each roll contains approx. 150 sq ft (13.9 sq.m.), 36" X 50' (0.9m x 20.3m) or 200 sq ft (18.6 sq.m.), 36" X 66.7' (0.9m x 20.3m). **WeatherWatch® Leak Barrier**, by GAF.

2.06 SHINGLE UNDERLAYMENT

- A. Superior quality, water repellent, non-asphaltic underlayment. UV stabilized polypropylene construction. Meets or exceeds ASTM D226 and D4869. Each roll contains approximately 10 squares (1003 sq. ft.) of material and is 54" x 223'. **TigerPaw™** Roof Deck Protection, by GAF.

2.07 ROOFING CEMENT

- A. Asphalt Plastic Roofing Cement meeting the requirements of ASTM D 4586, Type I or II.

2.08 ROOF ACCESSORIES

- A. Exterior acrylic rust resistant aerosol roof accessory paint. Each 6 oz can is available in boxes of 6 and in a wide variety of colors to compliment the roof. **Shingle-Match™** Roof Accessory Paint by GAF.

2.09 ATTIC VENTILATION

- A. Ridge Vents

GAF ASPHALT SHINGLE GUIDE SPECIFICATION

1. Rigid plastic ridge ventilator designed to allow the passage of hot air out of attics. For use in conjunction with eave/ soffit intake ventilation products. Provides 18.0 sq inches (11613 sq.mm/m) in NFVA per lineal foot. Each package contains 40 lineal feet (12.19m) of vent. **Cobra® Rigid Vent 3™** ridge vent (includes 3" (76mm) galvanized ring shank nails), by GAF
2. Rigid plastic ridge ventilator designed to allow the passage of hot air from attics while prohibiting snow infiltration. For use in conjunction with eave/ soffit intake ventilation products. Provides 18.0 sq inches (11613 sq.mm/m) NFVA per lineal foot. Each package contains 40 lineal feet (12.19m) of vent. **Cobra® Snow Country™** or **Cobra® Snow Country Advanced™** Ridge Vent (includes 3" (76mm) galvanized ring shank nails), by GAF.

2.10 VENTILATION ACCESSORIES

A. Chimney Cap

1. Stainless steel vented chimney cap. **MasterFlow™ CC1313SS** Safety Cap by GAF.
2. Epoxy powder finished vented chimney cap. **MasterFlow™ CC99, CC913 and CC1313** Safety Cap by GAF
3. Epoxy powder finished adjustable bracket mount vented chimney cap. **MasterFlow™ CC99, CC913 and CC1313** Safety Cap by GAF.

B. Foundation Vent

1. High Density Polyethylene constructed electric foundation vent provides up to 330 CFM/airflow. Independent laboratory approved. **Masterflow™ PFV1** Foundation Vent by GAF.
2. High Density Polyethylene constructed automatic foundation vent. **Masterflow™ FVRABL** Foundation Vent by GAF.
3. Die Cast aluminum positive open/closed damper foundation vent. **Masterflow™ 500** Foundation Vent by GAF.
4. Galvanized steel or aluminum high level ventilation foundation vent. **Masterflow™ BVSII** Foundation Vent by GAF.

2.11 NAILS

- A. Standard round wire, zinc-coated steel or aluminum; 10 to 12 gauge, smooth, barbed or deformed shank, with heads 3/8 inch (9mm) to 7/16 inch (11mm) in diameter. Length must be sufficient to penetrate into solid wood at least 3/4 inch (19mm) or through plywood or oriented strand board by at least 1/8 inch (3.18mm).

2.12 METAL FLASHING

- A. .24 gauge hot-dip galvanized steel sheet, complying with ASTM A 653/A 653M, G90/Z275.
- B. 16-oz/sq ft (0.56mm) copper sheet, complying with ASTM B 370.
- C. 0.032-inch (0.8mm) aluminum sheet, complying with ASTM B 209.

PART III EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until the roof deck has been properly prepared.
- B. If roof deck preparation is the responsibility of another installer, notify the architect or building owner of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Remove all existing roofing down to the roof deck.

GAF ASPHALT SHINGLE GUIDE SPECIFICATION

- B. Verify that the deck is dry, sound, clean and smooth. It shall be free of any depressions, waves, and projections. Cover with sheet metal, all holes over 1 inch (25mm) in diameter, cracks over 1/2 inch (12mm) in width, loose knots and excessively resinous areas.
 - C. Replace damaged deck with new materials.
 - D. Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.
- 3.03 INSTALLATION OF UNDERLAYMENTS
- A. General:
 - 1. Install using methods recommended by GAF, in accordance with local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
 - B. Eaves:
 - 1. Install eaves edge metal flashing tight with fascia boards; lap joints 2 inches (51mm) and seal with plastic cement or high quality urethane sealant; nail at the top of the flange.
 - 2. In the north, and on all roofs between 2/12 and 4/12 (low slopes) install GAF leak barrier up the slope from eaves edge a full 36 inches (914mm) or to at least 24 inches (610 mm) beyond the interior "warm wall". Lap ends 6 inches (152mm) and bond.
 - C. Valleys:
 - 1. Install eaves protection membrane at least 36 (914mm) inches wide and centered on the valley. Lap ends 6 inches (152mm) and seal.
 - 2. Where valleys are indicated to be "open valleys", install metal flashing over GAF leak barrier before GAF roof deck protection is installed; DO NOT nail through the flashing. Secure the flashing by nailing at 18 inches (457 mm) on center just beyond edge of flashing so that nail heads hold down the edge.
 - D. Hips and Ridges:
 - 1. Install GAF leak barrier along entire lengths. If ridge vents are to be installed, position the GAF leak barrier so that the ridge slots will not be covered.
 - E. Roof Deck:
 - 1. Install one layer of GAF roof deck protection over the entire area not protected by GAF leak barrier at the eaves or valley. Install sheets horizontally so water sheds and nail in place.
 - 2. On roofs sloped at more than 4 in 12, lap horizontal edges at least 2 inches (51mm) and at least 2 inches (51mm) over eaves protection membrane.
 - 3. On roofs sloped between 2 in 12 and 4 in 12, lap horizontal edges at least 19 inches (482 mm) and at least 19 inches (482mm) over eaves protection membrane.
 - 4. Lap ends at least 4 inches (102 mm). Stagger end laps of each layer at least 36 inches (914 mm).
 - 5. Lap GAF roof deck protection over GAF leak barrier in valley at least 6 inches (152mm).
 - F. Penetrations:
 - 1. Vent pipes: Install a 24 inch (610 mm) square piece of eaves protection membrane lapping over roof deck underlayment; seal tightly to pipe.

GAF ASPHALT SHINGLE GUIDE SPECIFICATION

2. Vertical walls: Install eaves protection membrane extending at least 6 inches (152mm) up the wall and 12 inches (305mm) on to the roof surface. Lap the membrane over the roof deck underlayment.
3. Skylights and roof hatches: Install eaves protection membrane from under the built-in counterflashing and 12 inches (305mm) on to the roof surface lapping over roof deck underlayment.
4. Chimneys: Install eaves protection membrane around entire chimney extending at least 6 inches (152mm) up the wall and 12 inches (305mm) on to the roof surface. Lap the membrane over the roof deck underlayment.
5. Rake Edges: Install metal edge flashing over eaves protection membrane and roof deck underlayment; set tight to rake boards; lap joints at least 2 inches (51mm) and seal with plastic cement; secure with nails.

3.04 INSTALLATION OF SHINGLES

A. General:

1. Install in accordance with GAF's instructions and local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
2. Minimize breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F (4 degrees C).
3. Handle carefully in hot weather to avoid scuffing the surfacing, or damaging the shingle edges.

B. Placement and Nailing:

1. Beginning with the starter strip, trim shingles so that they "nest" within the shingle located beneath it. This procedure will yield a first course that is typically 3" (76mm) to 4" (102mm) rather than a fully exposed shingle.
2. For maximum wind resistance along rakes, install any GAF starter strip containing sealant or cement shingles to underlayment and each other in a 4" (102mm) width of asphalt plastic roof cement.
3. Laterally, offset the new shingles from the existing keyways, to avoid waves or depressions caused by excessive dips in the roofing materials.
4. Using the bottom of the tab on existing shingles, align subsequent courses.
5. *Note: DO NOT install standard sized shingles (5" exposure) over metric (5 5/8" exposure) shingles, as it will overexpose the shingles and reveal the nails. Use standard alignment methods to assure proper shingle placement.
6. Secure with 4, 5, or 6 nails per shingle per GAF's instructions or local codes.
7. Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
8. Nails must be driven flush with the shingle surface. Do not overdrive or under drive the nails.
9. Shingle offset varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.

C. Valleys

1. Install valleys using the "open valley" method:

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- a Snap diverging chalk lines on the metal flashing, starting at 3 inches (76mm) each side of top of valley, spreading at 1/8 inch per foot (9mm per meter) to the eaves.
 - b Run shingles to chalk line.
 - c Trim last shingle in each course to match the chalk line; do not trim shingles to less than 12 inches (305mm) wide.
 - d Apply a 2 inch (51mm) wide strip of plastic cement under ends of shingles, sealing them to the metal flashing.
2. Install valleys using the "closed cut valley" method:
- a Run the first course of shingles from the higher roof slope across the valley at least 12 inches (305mm).
 - b Run succeeding courses of shingles from the lower roof slope across the valley at least 12 inches (305mm) and nail not closer than 6 inches (152mm) to center of valley.
 - c Run shingles from the upper roof slope into the valley and trim 2 inches (51mm) from the center line.
3. Install valleys using "woven valley" method: Run shingles from both roof slopes at least 12 inches (305mm) across center of valley, lapping alternate sides in a woven pattern.
- b DO NOT nail less than 6 inches (152mm) from the valley center line.

D. Penetrations

1. All Penetrations are to be flashed according to GAF, ARMA and NRCA application instructions and construction details.

E. Skylights and Roof Hatches

1. Consult the manufacturer of the skylight or roof hatch for specific installation recommendations.
2. Skylights and roof hatches shall be installed with pre-fabricated metal flashings specifically designed for the application of the unit.

3.05 INSTALLATION OF ATTIC VENTILATION

A. General

1. Ventilation must meet or exceed current F.H.A., H.U.D. and local code requirements.

B. Ridge / Soffit ventilation

1. Install ridge vent along the entire length of ridges:
2. Cut continuous vent slots through the sheathing, stopping 6 inches (152mm) from each end of the ridge.
3. On roofs without ridge board, make a slot 1 inch (25mm) wide, on either side of the peak (2" (51mm) overall).
4. On roofs with ridge board, make two slots 1-3/4 inches (44.5mm) wide, one on each side of the peak (3 1/2" (89mm) overall).
5. Install ridge vent material along the full length of the ridge, including uncut areas.
6. Butt ends of ridge vent material and join using roofing cement.
7. Install eaves vents in sufficient quantity to equal or exceed the ridge vent area.

3.06 INSTALLATION OF VENTILATION ACCESSORIES

GAF ASPHALT SHINGLE GUIDE SPECIFICATION

A. Chimney Caps

1. Install chimney caps to manufacturer recommendations

B. Foundation Vents

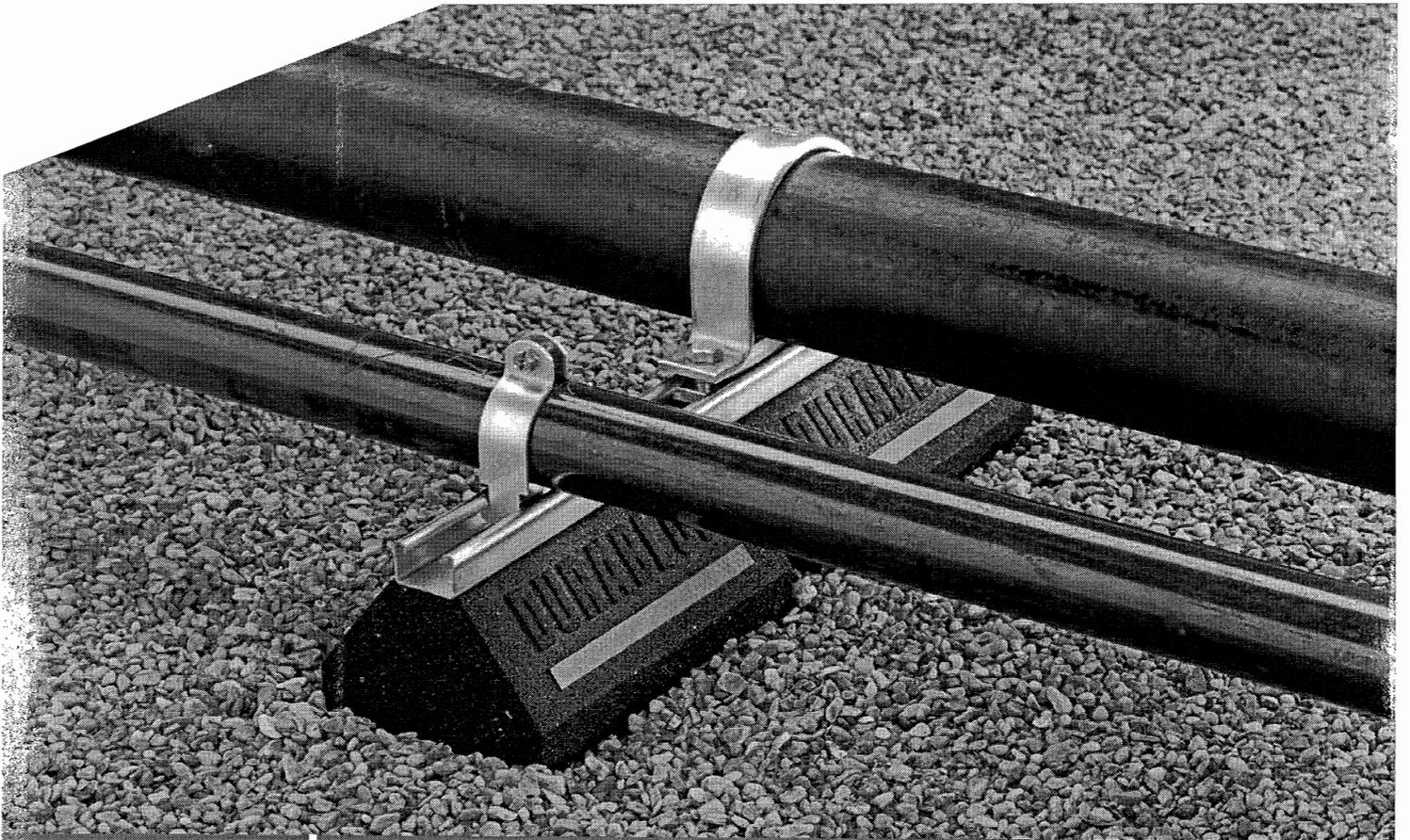
1. Install foundation vents per manufacturer recommendations and applications.

3.07 PROTECTION

A. Protect installed products from foot traffic until completion of the project.

- ### **B. Any roof areas that are not completed by the end of the workday are to be protected from moisture and contaminants.**

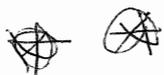
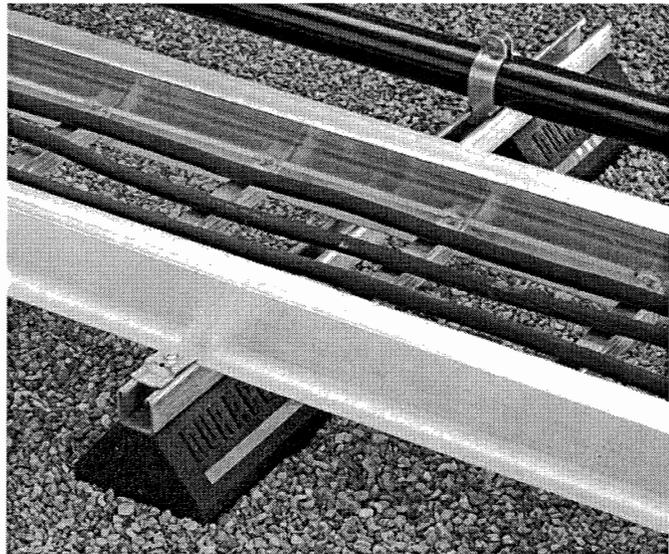
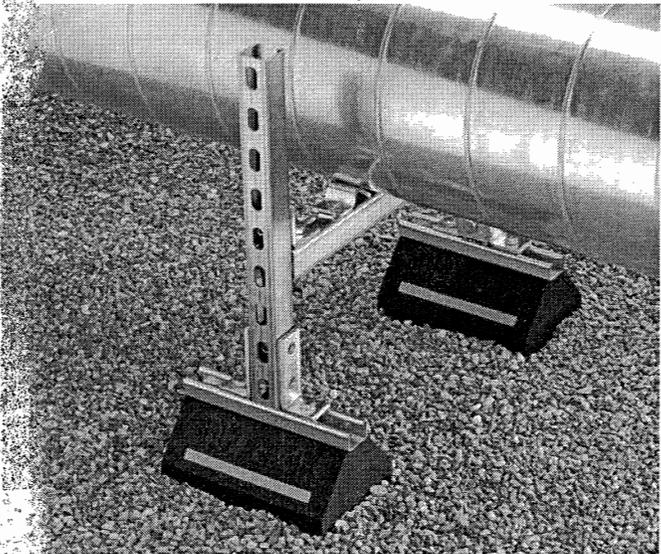
END OF SECTION



DURA-BLOK™

A Complete Rooftop Support Solution

COOPER B-Line



DURA-BLOK™ Rooftop Solutions Support



DURA-BLOK™ Supports are made of 100% recycled rubber and are designed to provide an economical way to support pipes, HVAC systems, rooftop walkway systems, ducting, conduit, cable tray, and more.

Features & Benefits

- Made from 100% recycled rubber
- Qualifies for LEED credits
- Reflective strip on both sides allow for easy product visibility
- Channel is through bolted on all sizes for added strength
- 1" gap between blocks allows water to flow freely around longer assemblies
- No roof penetration required
- Product composition is not sharp or abrasive helping to extend the roof life
- Dampens vibration
- No need for supplemental rubber pad
- Will not float or blow away
- UV resistant
- Suitable for any type roofing material or other flat surface
- For sloped roofs see adjustable hinge fitting (B634) on page 11

Base Only

DURA-BLOK™ channel support is designed as an economical support for piping systems, cable tray, HVAC equipment and many other applications.



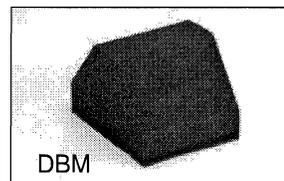
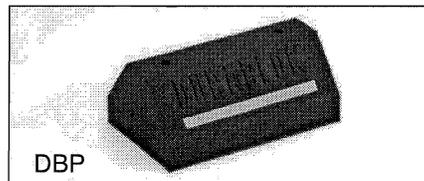
Specifications:

Dimensions - 4" (101mm) High x 6" (152mm) Wide x 9.6" (244mm) Long (base length)

Material - 100% recycled rubber, UV resistant

Ultimate Load Capacity - (uniform load) *

DBP - 500 lbs. (2.22kN) DBM - 200 lbs. (0.89kN)



UPC/Part No.	B-Line Cat. No.	Height	Width	Length	Weight Each
782051 49691	DBP	4" (101mm)	6" (152mm)	9.6" (244mm)	4.48 (2.03kg)
782051 50005	DBM	4" (101mm)	6" (152mm)	4.8" (122mm)	2.35 (1.07kg)

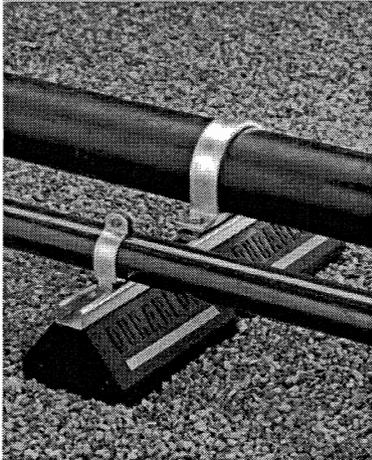
* For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.

Rooftop Applications

DB - Series

Base with 14 ga. (1.9mm) Galv. Channel - 1" (25.4mm) high

DURA-BLOK™ DB-Series channel support is designed for superior support of piping systems, cable tray, HVAC equipment, walkway systems and many other applications.



Specifications:

Dimensions - 5" (127mm) High x 6" (152mm) Wide x Length (overall length)

Material - 100% recycled rubber, UV resistant

Ultimate Load Capacity - (uniform load) *

DB5 = 200 lbs. (0.89kN)

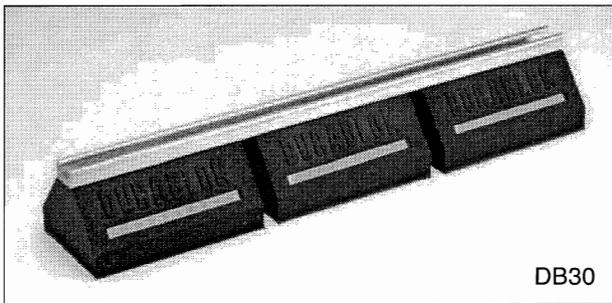
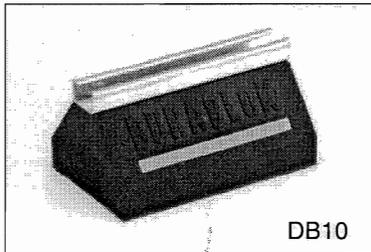
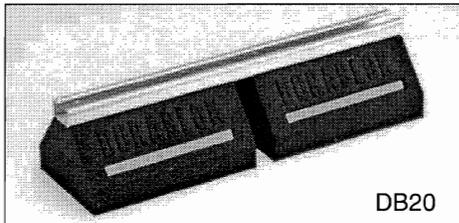
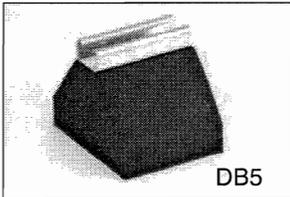
DB30 = 1,500 lbs. (6.67kN)

DB10 = 500 lbs. (2.22kN)

DB40 = 2,000 lbs. (8.89kN)

DB20 = 1,000 lbs. (4.45kN)

DB48 = 2,500 lbs. (11.12kN)



UPC/Part No.	B-Line Cat. No.	Height	Width	Overall Length	Weight Each
782051 50035	DB5	5" (127mm)	6" (152mm)	4.8" (122mm)	2.75 (1.25kg)
782051 49972	DB10	5" (127mm)	6" (152mm)	9.6" (244mm)	5.28 (2.39kg)
782051 49974	DB20	5" (127mm)	6" (152mm)	20.2" (513mm)	10.63 (4.82kg)
782051 50021	DB30	5" (127mm)	6" (152mm)	30.8" (782mm)	15.99 (7.25kg)
782051 50022	DB40	5" (127mm)	6" (152mm)	41.4" (1052mm)	21.34 (9.68kg)
782051 50023	DB48	5" (127mm)	6" (152mm)	52.0" (1321mm)	26.70 (12.4kg)

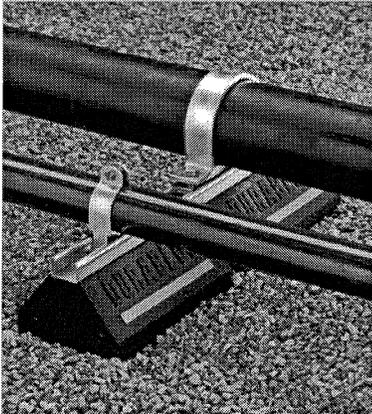
* For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.

Rooftop Supports

DB6 - Series

Base with 12 ga. (2.6mm) Galv. Channel - 2⁷/₁₆" (62mm) high

DURA-BLOK™ DB6-Series channel support is designed for superior support of piping systems, cable tray, HVAC equipment, walkway systems and many other applications.



Specifications:

Dimensions - 6⁷/₁₆" (163mm) High x 6" (152mm) Wide x Length (overall length - see below)

Material - 100% recycled rubber, UV resistant

Ultimate Load Capacity - (uniform load) *

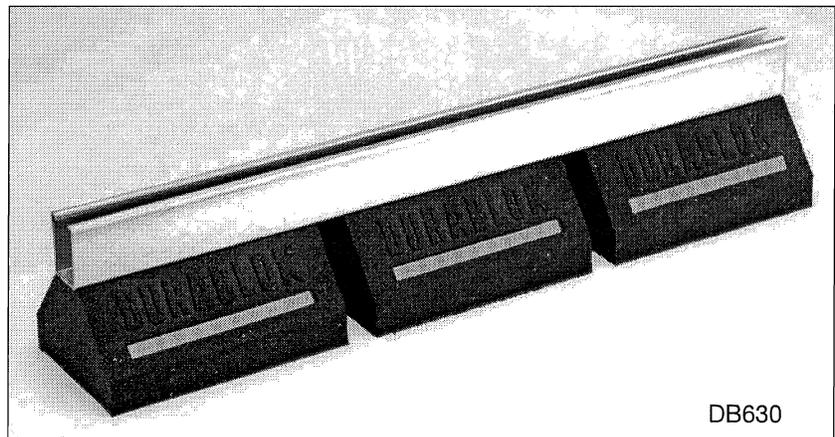
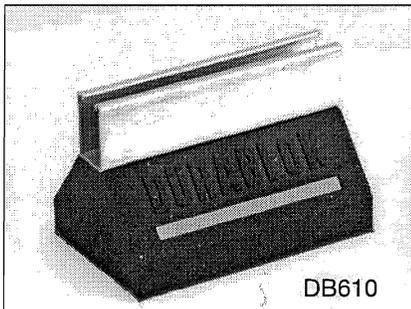
DB610 = 500 lbs. (2.22kN)

DB620 = 1,000 lbs. (4.45kN)

DB630 = 1,500 lbs. (6.67kN)

DB640 = 2,000 lbs. (8.89kN)

DB648 = 2,500 lbs. (11.12kN)



UPC/Part No.	B-Line Cat. No.	Height	Width	Overall Length	Weight Each
782051 50024	DB610	6 ⁷ / ₁₆ " (167mm)	6" (152mm)	9.6" (244mm)	6.36 (2.88kg)
782051 50025	DB620	6 ⁷ / ₁₆ " (167mm)	6" (152mm)	20.2" (513mm)	12.90 (5.85kg)
782051 50026	DB630	6 ⁷ / ₁₆ " (167mm)	6" (152mm)	30.8" (782mm)	19.45 (8.82kg)
782051 50027	DB640	6 ⁷ / ₁₆ " (167mm)	6" (152mm)	41.4" (1052mm)	26.00 (11.79kg)
782051 50028	DB648	6 ⁷ / ₁₆ " (167mm)	6" (152mm)	52.0" (1321mm)	32.55 (14.76kg)

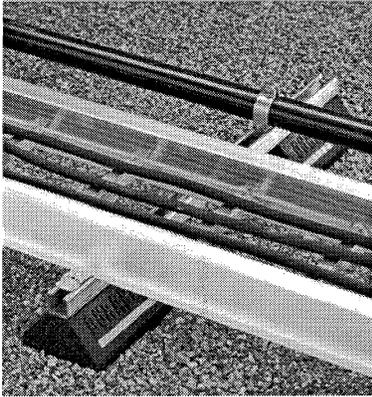
* For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.

Rooftop Supports

DB10 - Series

Two (2) Bases with 12 ga. (2.6mm) Galv. Channel - 1 5/8" (41mm) high

DURA-BLOK™ DB10-Series channel support is designed for superior support of piping systems, cable tray, HVAC equipment, walkway systems and many other applications.

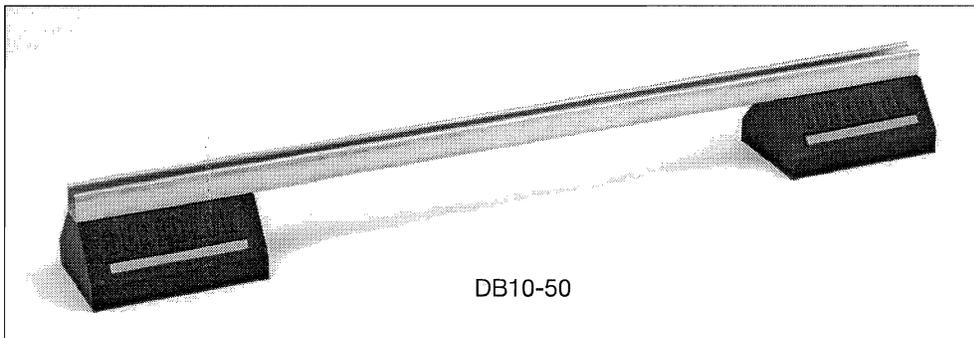
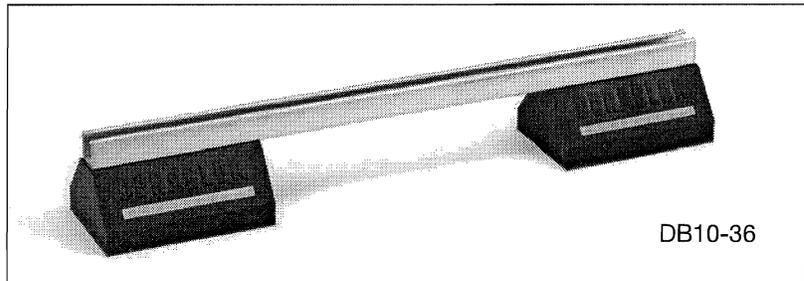


Specifications:

Dimensions - 5 5/8" (143mm) High x 6" (152mm) Wide x
Length (bridge length - see below)

Material - 100% recycled rubber, UV resistant

Ultimate Load Capacity - 1,000 lbs. (4.45kN) (uniform load) *



UPC/Part No.	B-Line Cat. No.	Height	Individual Base Length	Bridge Length	Weight Each
782051 50029	DB10-28	5 5/8" (143mm)	9.6" (244mm)	28" (711mm)	2.75 (1.25kg)
782051 50031	DB10-36	5 5/8" (143mm)	9.6" (244mm)	36" (914mm)	5.28 (2.39kg)
782051 50032	DB10-42	5 5/8" (143mm)	9.6" (244mm)	42" (1067mm)	10.63 (4.82kg)
782051 50033	DB10-50	5 5/8" (143mm)	9.6" (244mm)	50" (1270mm)	15.99 (7.25kg)
782051 50034	DB10-60	5 5/8" (143mm)	9.6" (244mm)	60" (1524mm)	21.34 (9.68kg)

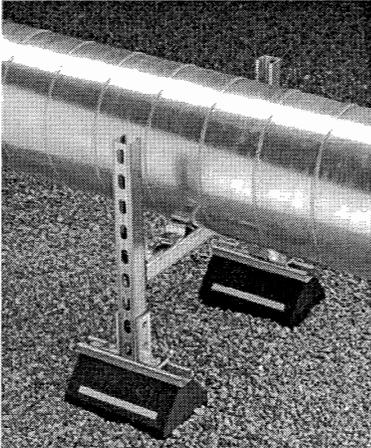
* For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.

Duct Supports

DB_DS - Series

Two (2) Base Supports with 12 ga. (2.6mm)
Galv. Channel - 1 $\frac{5}{8}$ " (41mm) high

DURA-BLOK™ DB_DS-Series channel support with risers is designed for superior support of piping systems, cable tray, HVAC equipment, walkway systems and many other applications.



Specifications:

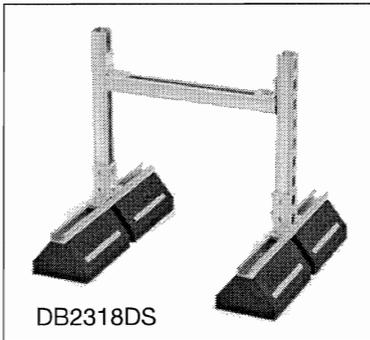
Dimensions - Height (overall) x Width (overall) x Length (overall - see table)

Riser Channels (SH Style) - 1 $\frac{5}{8}$ " (41mm) x 1 $\frac{5}{8}$ " (41mm)
x 12 ga. (2.6mm)

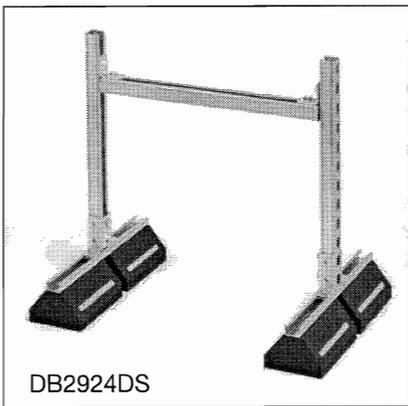
Fittings & Hardware - Electro-Plated Steel

Material - 100% recycled rubber, UV resistant

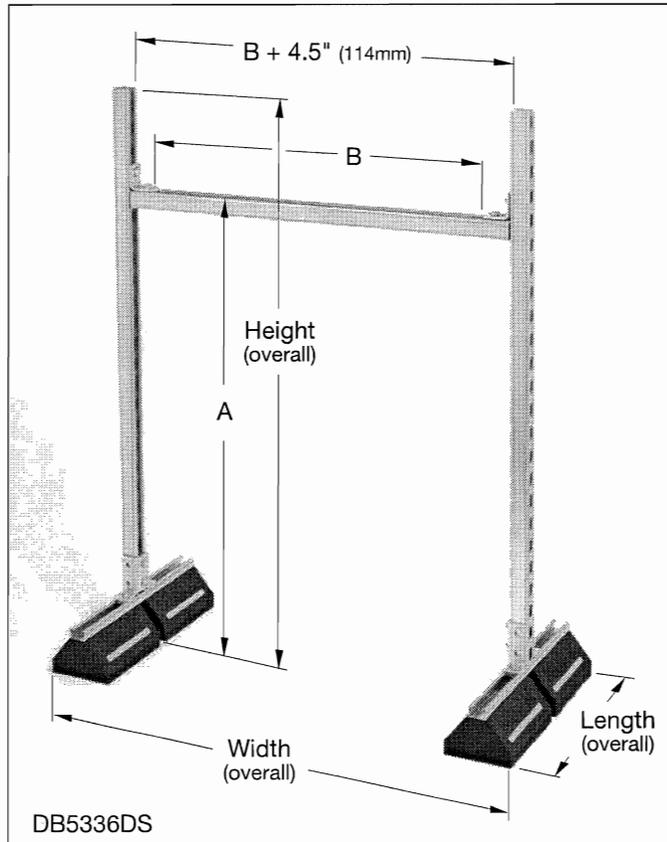
Ultimate Load Capacity - 1,000 lbs. (4.45kN) (uniform load) *



DB2318DS



DB2924DS



Product is shipped unassembled.

* For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.

Duct Supports

DB_DS - Series cont.

UPC/Part No.	B-Line Cat. No.	A (Minimum)	A (Maximum)	B	Weight Each
782051 50717	DB2318DS	10.56" (268mm)	20.75" (527mm)	13.50" (343mm)	33.31 (15.11kg)
782051 50718	DB2918DS	10.56" (268mm)	26.75" (679mm)	13.50" (343mm)	35.00 (15.88kg)
782051 50719	DB4118DS	10.56" (268mm)	38.75" (984mm)	13.50" (343mm)	38.40 (17.42kg)
782051 50720	DB5318DS	10.56" (268mm)	50.75" (1289mm)	13.50" (343mm)	41.80 (18.96kg)
782051 50721	DB2324DS	10.56" (268mm)	20.75" (527mm)	19.50" (495mm)	34.15 (15.49kg)
782051 50722	DB2924DS	10.56" (268mm)	26.75" (679mm)	19.50" (495mm)	35.84 (16.26kg)
782051 50723	DB4124DS	10.56" (268mm)	38.75" (984mm)	19.50" (495mm)	39.25 (17.80kg)
782051 50724	DB5324DS	10.56" (268mm)	50.75" (1289mm)	19.50" (495mm)	42.65 (19.34kg)
782051 50725	DB2336DS	10.56" (268mm)	20.75" (527mm)	31.50" (800mm)	35.84 (16.26kg)
782051 50726	DB2936DS	10.56" (268mm)	26.75" (679mm)	31.50" (800mm)	37.55 (17.03kg)
782051 50727	DB4136DS	10.56" (268mm)	38.75" (984mm)	31.50" (800mm)	40.95 (18.57kg)
782051 50728	DB5336DS	10.56" (268mm)	50.75" (1289mm)	31.50" (800mm)	44.34 (20.11kg)
782051 50729	DB2348DS	10.56" (268mm)	20.75" (527mm)	43.50" (1105mm)	37.55 (17.03kg)
782051 50730	DB2948DS	10.56" (268mm)	26.75" (679mm)	43.50" (1105mm)	39.25 (17.80kg)
782051 50731	DB4148DS	10.56" (268mm)	38.75" (984mm)	43.50" (1105mm)	42.65 (19.34kg)
782051 50732	DB5348DS	10.56" (268mm)	50.75" (1289mm)	43.50" (1105mm)	46.03 (20.88kg)

B-Line Cat. No.	Height (overall)	Width (overall)	Length (overall)
DB2318DS	23" (584mm)	25 ⁵ / ₈ " (651mm)	20.2" (513mm)
DB2918DS	29" (736mm)	25 ⁵ / ₈ " (651mm)	20.2" (513mm)
DB4118DS	41" (1041mm)	25 ⁵ / ₈ " (651mm)	20.2" (513mm)
DB5318DS	53" (1346mm)	25 ⁵ / ₈ " (651mm)	20.2" (513mm)
DB2324DS	23" (584mm)	31 ⁵ / ₈ " (803mm)	20.2" (513mm)
DB2924DS	29" (736mm)	31 ⁵ / ₈ " (803mm)	20.2" (513mm)
DB4124DS	41" (1041mm)	31 ⁵ / ₈ " (803mm)	20.2" (513mm)
DB5324DS	53" (1346mm)	31 ⁵ / ₈ " (803mm)	20.2" (513mm)
DB2336DS	23" (584mm)	43 ⁵ / ₈ " (1108mm)	20.2" (513mm)
DB2936DS	29" (736mm)	43 ⁵ / ₈ " (1108mm)	20.2" (513mm)
DB4136DS	41" (1041mm)	43 ⁵ / ₈ " (1108mm)	20.2" (513mm)
DB5336DS	53" (1346mm)	43 ⁵ / ₈ " (1108mm)	20.2" (513mm)
DB2348DS	23" (584mm)	55 ⁵ / ₈ " (1415mm)	20.2" (513mm)
DB2948DS	29" (736mm)	55 ⁵ / ₈ " (1415mm)	20.2" (513mm)
DB4148DS	41" (1041mm)	55 ⁵ / ₈ " (1415mm)	20.2" (513mm)
DB5348DS	53" (1346mm)	55 ⁵ / ₈ " (1415mm)	20.2" (513mm)

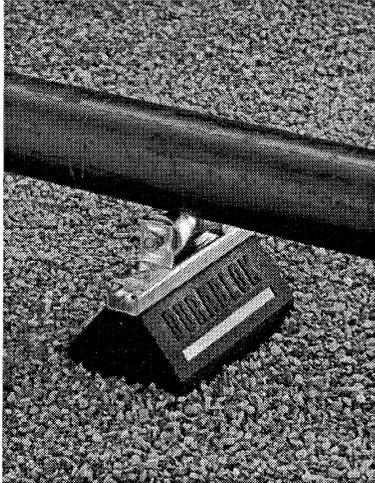
A = Adjustable height from bottom of DURA-BLOK to top of horizontal channel.
 B = Space between fittings that support horizontal channel.
 Height (overall) = Distance from bottom of DURA-BLOK to top of upright channel.
 Width (overall) = Distance from outside-to-outside of DURA-BLOK supports.
 Length (overall) = Distance from end-to-end of DURA-BLOK supports.

Rooftop Pipe Supports

DBR - Series Fixed Height

Base with 14 ga. (1.9mm) Galv. Channel - 1" (25.4mm) high and Pipe Roller Assembly

DURA-BLOK™ DBR-Series support is designed to support pipe where longitudinal movement is expected.



Specifications:

Dimensions - Height to Bottom of Pipe x 6" (152mm) Wide x Long (length - see below)

Material - 100% recycled rubber, UV resistant

Pipe Roller Material - Cast Iron - Electro Plated

Brackets, Axle, & Hardware - Electro Plated Steel

Ultimate Load Capacity - (uniform load) *

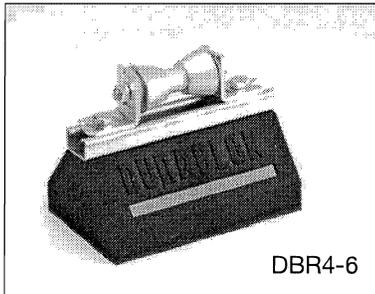
DBR2-3 1/2 = 500 lbs. (2.22kN)

DBR12-14 = 1000 lbs. (4.44kN)

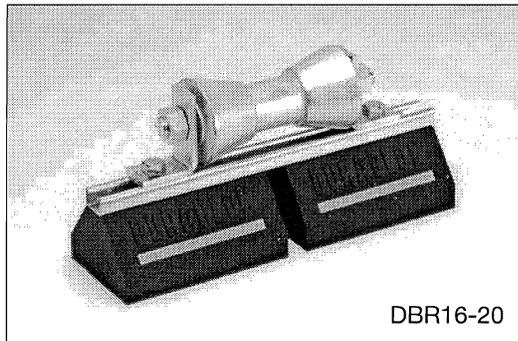
DBR4-6 = 500 lbs. (2.22kN)

DBR16-20 = 1000 lbs. (4.44kN)

DBR8-10 = 1000 lbs. (4.44kN)



DBR4-6



DBR16-20



UPC/Part No.	B-Line Cat. No.	Roller Part No.†	Height **	Width	Length	Weight Each
782051 50745	DBR2-3 1/2	B3126-2 to 3 1/2	7.09" (180mm)	6" (152mm)	9.6" (244mm)	5.28 (2.39kg)
782051 50746	DBR4-6	B3126-4 to 6	7.09" (180mm)	6" (152mm)	9.6" (244mm)	10.63 (4.82kg)
782051 50747	DBR8-10	B3126-8 to 10	8.34" (212mm)	6" (152mm)	20.2" (513mm)	15.99 (7.25kg)
782051 50748	DBR12-14	B3126-12 to 14	8.34" (212mm)	6" (152mm)	20.2" (513mm)	21.34 (9.68kg)
782051 50749	DBR16-20	B3126-16 to 20	8.34" (212mm)	6" (152mm)	20.2" (513mm)	26.70 (12.11kg)

† See Pipe Hanger Catalog for dimensions and specifications.

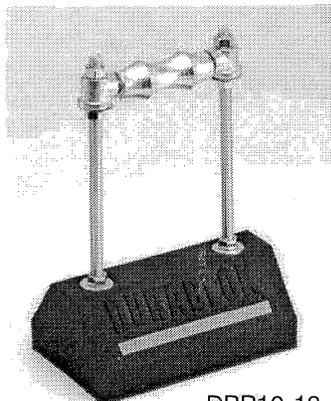
** From bottom of rubber block to bottom of pipe/tubing.

* For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.

Rooftop Pipe Supports

DBR - Series Adjustable Height

Base with two (2) ½" (12.7mm) - 13" (330mm) Electro Zinc All Threaded Rod Risers and a B3114-3½" (88.9mm) Pipe Roll with Sockets



DBR10-12

DURA-BLOK™ DBR-Series support is designed to support pipe up to 3½" (90mm) nominal size where difference in elevation is required and longitudinal movement is expected.

Specifications:

Dimensions - Overall Height 12" (305mm) from bottom of base to pipe contact point on roller. Base - 4" High (101mm) x 6" (152mm) Wide x 9.6" (244mm) Length (base length)

Material - 100% recycled rubber, UV resistant

Pipe Roll & Sockets - For up to 3½" (90mm) pipe sizes.

Ultimate Load Capacity - 200 lbs. (0.89kN) *

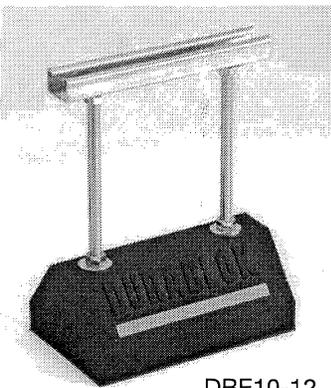
To increase load capacity use CLDP10 load distribution plate.



UPC/Part No.	B-Line Cat. No.	Adjustable Height	Width	Length	Weight Each
782051 50750	DBR10-12	up to 12" (305mm)	6" (152mm)	9.6" (244mm)	6.46 (2.93kg)

DBE - Series Elevated

Base with two (2) ½" (12.7mm) - 13" Electro Zinc All Threaded Rod Risers and 14 ga. (1.9mm) Galv. Slotted Channel - 1" (25.4mm) high



DBE10-12

DURA-BLOK™ DBE-Series channel support is designed as a support of piping systems, cable tray, HVAC equipment and many other applications where elevation adjustment is critical.

Specifications:

Dimensions - Overall Height as Specified Base - 4" High (101mm) x 6" (152mm) Wide x 9.6" (244mm) Length (base length)

Material - 100% recycled rubber, UV resistant

Ultimate Load Capacity - 200 lbs. (0.89kN) *

(To increase load capacity use CLDP10 load distribution plate.)

For pipe straps/clamps, rollers and roller supports that can be used with these DURA-BLOK supports, see other components on page 13.



UPC/Part No.	B-Line Cat. No.	Adjustable Height	Width	Channel Length	Weight Each
782051 50036	DBE10-8	5½" - 8" (140 - 203mm)	6" (152mm)	9.35" (161mm)	5.68 (2.58kg)
782051 50037	DBE10-12	5½" - 12" (140 - 305mm)	6" (152mm)	9.35" (161mm)	5.72 (2.59kg)
782051 50038	DBE10-16	5½" - 16" (140 - 406mm)	6" (152mm)	9.35" (161mm)	5.76 (2.61kg)

** Longer base lengths available.

Note: At heights above 12" (305mm), we suggest using the DB_DS Series Channel Support with Risers for additional stability to piping system.

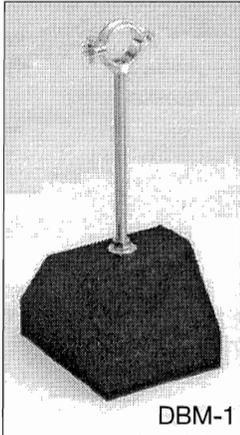
* For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.

Rooftop Pipe Supports

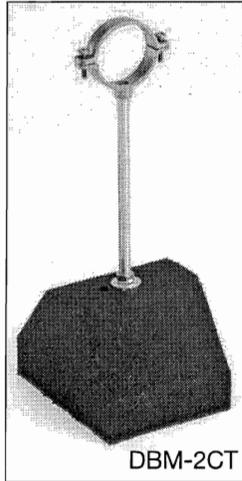
DBM - Series

Base with one (1) 3/8" - 16 Electro Zinc All Threaded Rod and Hinged Pipe Clamp

DURA-BLOK™ DBM-Series pipe/tubing support is designed for support of single piping systems where elevation adjustment is needed.



DBM-1



DBM-2CT

Specifications:

Dimensions - Height to Pipe Center x 6" (152mm) Wide x 4.8" (122mm) Long (overall length)

Material - 100% recycled rubber, UV resistant

Pipe Clamp Material - Malleable Iron -

Threaded Rod/Hardware - Electro Plated Steel

Ultimate Load Capacity - 50 lbs. (0.22kN)
(uniform load) †



Copper Tubing Supports

UPC/ Part No.	B-Line Cat. No.	Clamp Part No.†	Height (Min.) **	Height (Max.) **	Width	Length	Weight Each
782051 50733	DBM-1/2CT	B3198HCT-1/2	9.69"(246mm)	11.19"(284mm)	6"(152mm)	4.80"(122mm)	2.75(1.25kg)
782051 50734	DBM-3/4CT	B3198HCT-3/4	9.84"(250mm)	11.34"(288mm)	6"(152mm)	4.80"(122mm)	2.76(1.25kg)
782051 50735	DBM-1CT	B3198HCT-1	9.95"(253mm)	11.45"(291mm)	6"(152mm)	4.80"(122mm)	2.84(1.29kg)
782051 50736	DBM-1 1/4CT	B3198HCT-1 1/4	10.13"(257mm)	11.63"(295mm)	6"(152mm)	4.80"(122mm)	2.95(1.34kg)
782051 50737	DBM-1 1/2CT	B3198HCT-1 1/2	10.28"(261mm)	11.78"(299mm)	6"(152mm)	4.80"(122mm)	2.96(1.34kg)
782051 50738	DBM-2CT	B3198HCT-2	10.53"(267mm)	12.03"(305mm)	6"(152mm)	4.80"(122mm)	3.03(1.37kg)

Steel Pipe Supports

UPC/ Part No.	B-Line Cat. No.	Clamp Part No.†	Height (Min.) **	Height (Max.) **	Width	Length	Weight Each
782051 50739	DBM-1/2	B3198H-1/2	9.86"(250mm)	11.36"(288mm)	6"(152mm)	4.80"(122mm)	2.78(1.26kg)
782051 50740	DBM-3/4	B3198H-3/4	10.06"(255mm)	11.56"(293mm)	6"(152mm)	4.80"(122mm)	2.84(1.29kg)
782051 50741	DBM-1	B3198H-1	10.14"(257mm)	11.64"(296mm)	6"(152mm)	4.80"(122mm)	2.86(1.30kg)
782051 50742	DBM-1 1/4	B3198H-1 1/4	10.25"(260mm)	11.75"(298mm)	6"(152mm)	4.80"(122mm)	2.93(1.33kg)
782051 50743	DBM-1 1/2	B3198H-1 1/2	10.42"(265mm)	11.92"(303mm)	6"(152mm)	4.80"(122mm)	2.99(1.36kg)
782051 50744	DBM-2	B3198H-2	10.66"(271mm)	12.16"(309mm)	6"(152mm)	4.80"(122mm)	3.10(1.41kg)

† See Pipe Hanger Catalog for dimensions and specifications.

** From bottom of rubber block to center of pipe/tubing.

† For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.

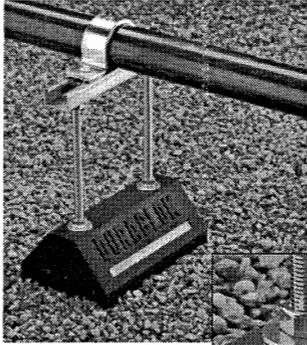
Components & Accessories

CLDP10

Load Distribution Plate

Two (2) Bases with 12 ga. (2.6mm) Galv. Channel -
1 5/8" (41mm) high

DURA-BLOK™ CLDP10 load bearing stabilizer plate increases load ratings for DBE Series and DBR Series supports by allowing the load from the threaded rods to be distributed over the length of the base instead of the point load where the rods attach to the base.

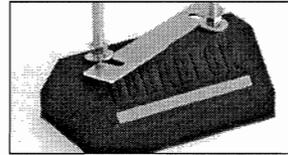
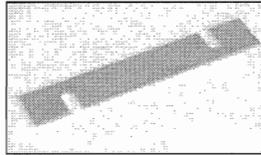
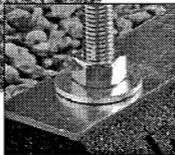


Specifications:

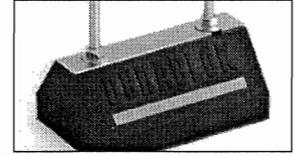
Dimensions - 5 5/8" (143mm) High x 6" (152mm) Wide x Length (overall)

Material - 11 Ga. steel (3.0mm)

Increases ultimate uniform load capacity on DBE & DBR Series supports to 500 lbs. (2.22kN)



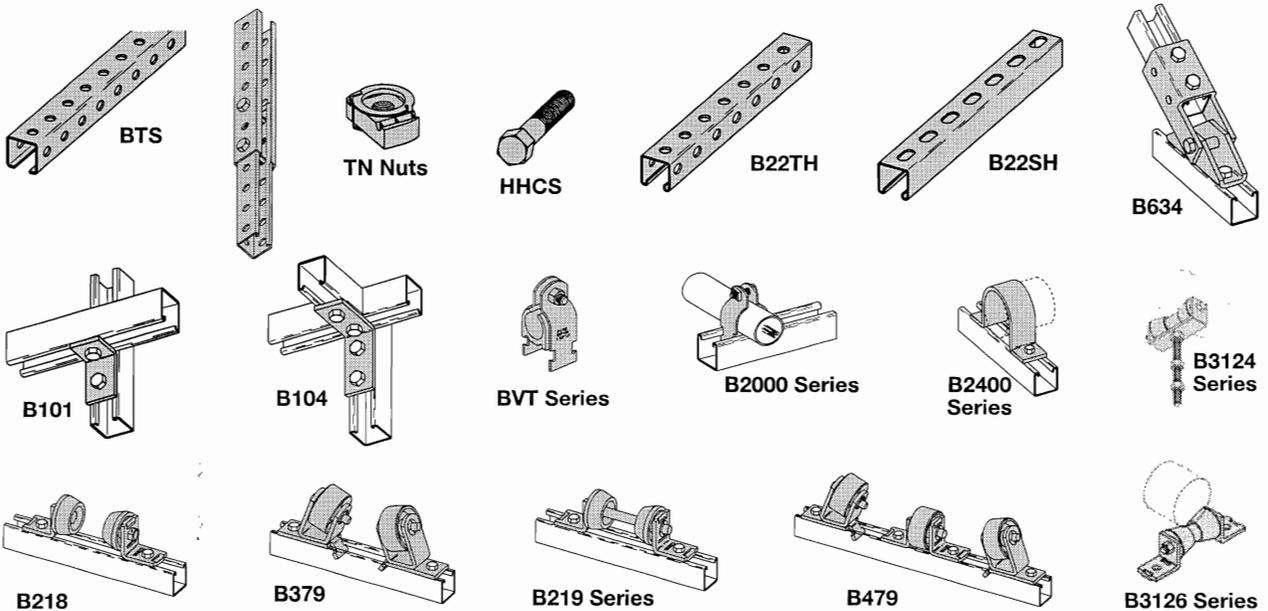
Loosen hex nuts and slide plate under the flat washers



Retighten the hex nuts with plate in place

UPC/Part No.	B-Line Cat. No.	Thickness	Width	Length	Weight Each
782051 36110	CLDP10	11 Ga. (3.0mm)	1 5/8" (41mm)	9.5" (241mm)	0.53 (0.24kg)

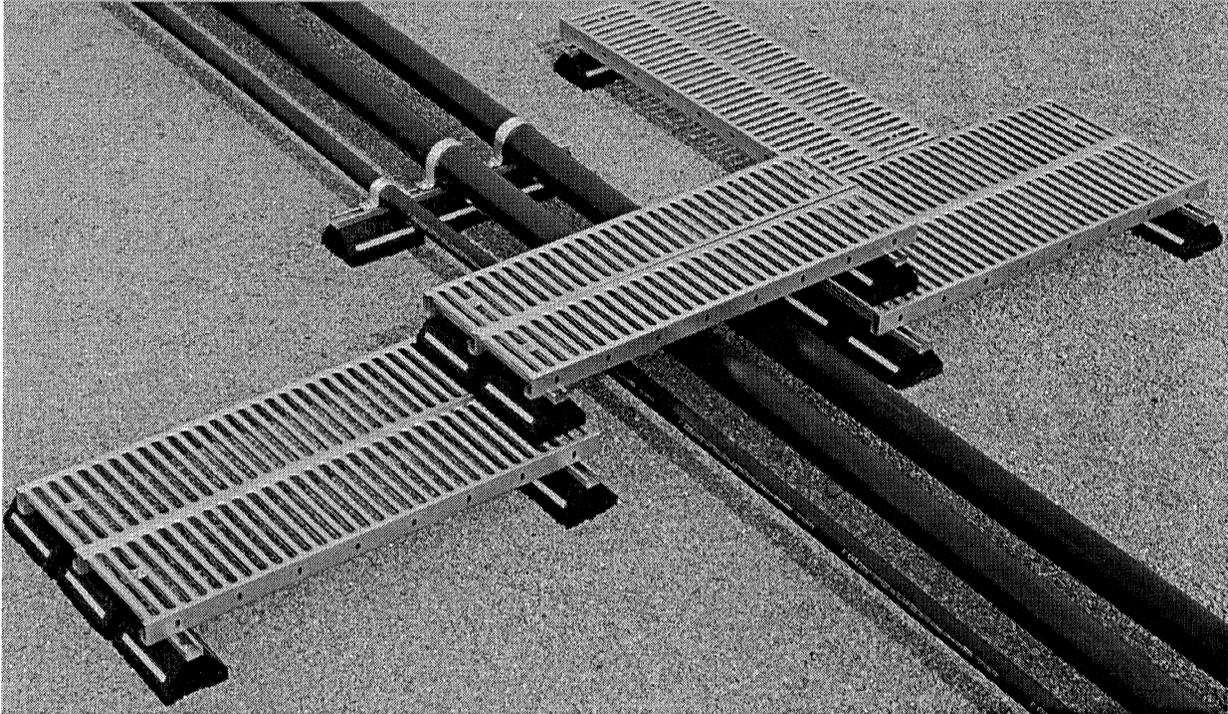
Compatible Components



Above rollers can be mounted on C-Series and CB-Series units 19" (482mm) or longer. See the Cooper B-Line Strut Systems Catalog for more information.

GRATEWALK™ Rooftop Walkways

Cooper B-Line GRATEWALK™ Rooftop Walkways with DURA-BLOK™ provides the optimal solution to extend the life of your roof, while providing a safe pathway to roof mounted support equipment.



Features & Benefits of the GRATEWALK™ Rooftop Walkway

- Available with slip resistant Grate-Lock™, helping provide a safe walkway for foot traffic on the roof.
- Easy to install, elevated design, creates an identifiable path for foot traffic helping prevent wear and tear to the roof surface.
- The cross-over design offers safe passage over existing cabling, piping, cable tray or any other interference on the rooftop.
- The self cleaning pattern allows water and dirt to easily flow through, helping make the grating an ideal walkway in all weather conditions.
- Handrail options are available
- Integrated with 100% post-consumer recycled rubber supporting LEED credit qualification.
- Provide solid support for the walkway that stays in place and replaces the need for separate rubber roof mounting pads which tend to float away.

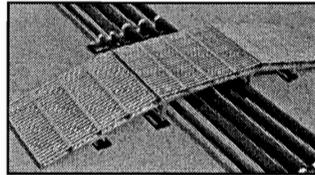
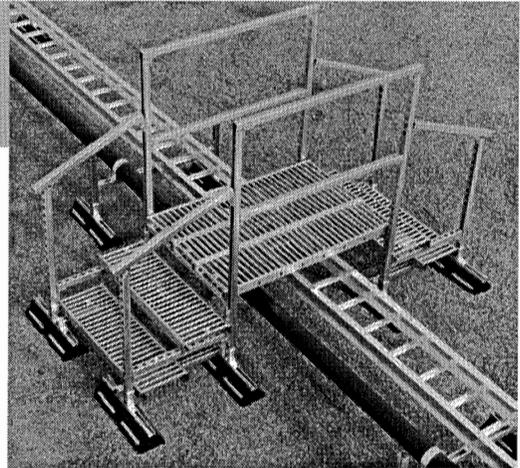
GRATEWALK™ Rooftop Walkways

GRATEWALK™ Rooftop Walkways with Integrated DURA-BLOK™ Supports

The GRATEWALK™ Rooftop Walkway with Integrated DURA-BLOK™ Supports is available in a variety of configurations.

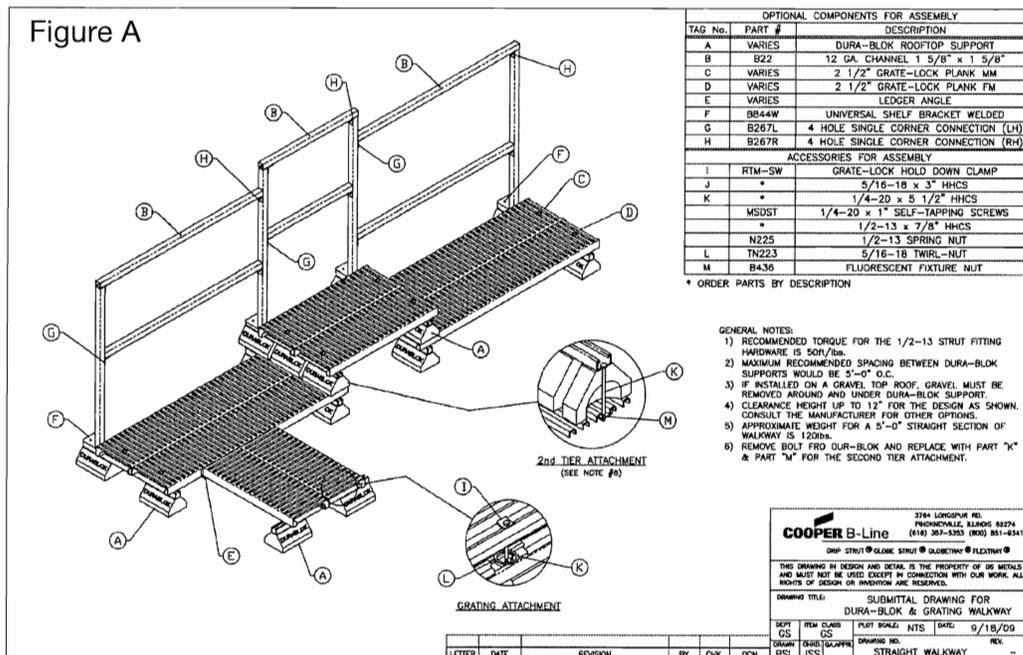
- Straight sections for long straight stretches of pathway
- Cross-over options to install over the existing cable trays, piping, and more
- Stairways over the top of existing equipment or leading up to existing equipment
- Handrail options available for additional walkway safety and support
- Platforms to provide access to rooftop mounted equipment
- Accessories available to support unique requirements

* All Items are shipped individually for field assembly.



Engineering Design Service

- Take-off and estimating
- Specification review and development
- Alternative layout designs
- Technical consultation
- Submittal drawing packages (see Figure A) including assembly instructions



SECTION 07720

ROOFTOP SUPPORT SYSTEMS

(Applicable to Section 15060 (Mechanical) and Section 16070 (Electrical))

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. The work covered by this specification consists of furnishing all labor, equipment, materials and accessories, and performing all operations required for the correct installation of recycled rubber pipe [conduit] supports for mechanical piping [electrical conduit] systems.

1.02 REFERENCES

- A. ASTM A653 G90 SS Gr. 33 - Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot Dipped Process
- B. ASTM B633 - Specification for Electrodeposited Coatings of Zinc on Iron and Steel
- C. ASTM C531 – Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical Resistant Mortars, Grouts, Monolithic Surfaces, and Polymer Concretes
- D. ASTM C642 – Test Method for Specific Gravity, Absorption, and Voids in Hardened Concrete
- E. ASTM C672 – Test Methods for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals
- F. ASTM D412 – Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension
- G. ASTM D395 – Standard Test Methods for Rubber Property – Compression Set
- H. ASTM D573 – Test Method for Rubber – Deterioration in an Air Oven
- I. ASTM D746 – Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
- J. ASTM D2240 – Test Method for Rubber Property – Durometer Hardness
- K. NFPA 70 – National Electrical Code

1.03 QUALITY ASSURANCE

- A. Rubber / steel pipe supports shall be manufactured under a strict quality control program assuring quality product delivered to the jobsite. Pipe supports that are damaged shall not be installed.
- B. Workmanship: All pipe [conduit] supports to be installed by a qualified piping [electrical] contractor and installed in accordance with manufacturer's recommendations.
 - 1. All work shall comply with all applicable federal, state, and local codes and laws having jurisdiction.
 - 2. All work shall conform to accepted industry and trade standards for pipe support [conduit] installations.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturer: Subject to compliance with these specifications, pipe support systems shall be DURA-BLOK™ design as supplied by Cooper B-Line, Inc. [or engineer approved equal].

2.02 MATERIALS

- A. Curb base must be made of 100% recycled rubber and polyurethane prepolymer with a uniform load capacity of 500 pounds per linear foot of support*. In addition, each base to have a reflective yellow stripe.
(*See 3.01(C))
- B. Dimensions: 6-inches wide by [4] [5.0] [6.75] inches tall by [9.6] [20.2] [30.8] [41.4] [52.0] inches long.
- C. Steel frame: Steel, 14ga strut galvanized per ASTM A653 or 12ga strut galvanized per ASTM A653 for bridge series.
- D. Attaching hardware: Zinc-plated threaded rod, nuts and attaching hardware per ASTM B633.

- E. Any products claiming to be a similar, like, or equal must demonstrate (meet or exceed) the same physical and performance characteristics as specified on the following page:
1. Density: 0.52 oz/cu in ASTM C642
 2. Durometer Hardness: 67.2A ± 1 ASTM D2240
 3. Tensile Strength: 231 psi minimum ASTM D412
 4. Compression Deformation: 5% at 70psi and 72°F ASTM D395
 5. Brittleness at Low Temp: -50°F ASTM D746
 6. Freeze and thaw when exposed to deicing chemicals: No loss after 50 cycles ASTM C672
 7. Coefficient of Thermal Expansion: 8×10^{-6} in/in/°F (min) ASTM C531
 8. Weathering: 70 hours at 120°F ASTM D573
 - a. Hardness retained: 100% (±5%)
 - b. Compressive strength: 100% (±5%)
 - c. Tensile strength: 100% (±5%)
 - d. Elongation retained: 100% (±5%)

2.03 TYPE OF ROOFTOP SUPPORTS

- A. Rubber block supports – DURA-BLOK™ model # [DBP] [DMB] base dimensions: 6-inch wide by 4-inch tall by [9.6] [4.8]-inch length. Accessories are fastened directly into rubber material with weather resistant type 12 lag screws.
- B. Continuous block channel supports – DURA-BLOK™ DB-Series or DB6-Series: Dimensions 6-inch wide by [5.0] [6.5]-inch tall by [9.6] [20.2] [30.8] [41.4] [52.0]-inch length. Assembly has 1" gaps between blocks for free flow of water. Standard strut accessories can be used for attachment.
- C. Bridge channel supports – DURA-BLOK™ DB10-Series; Dimensions 6-inch wide by 5½-inch tall by [28.0] [36.0] [42.0] [50.0] [60.0]-inch length. Standard strut accessories can be used for attachment.
- D. Extendible height support – DURA-BLOK™ model DBE 10-[8][12][16], height to suit application: 8-inch, 12-inch or 16-inch (200 pound maximum load). Base to be 9.6 inches in length or otherwise specified sizes available. Heavier loads, may require CLDP load distribution plate.
- E. Roller supports– DURA-BLOK™ DBR10 Series & DBR Series:
DBR10 Series is sized for pipe up to 3½ inches, with vertical adjustment up to 12 inches.
DBR Series is sized for [2-3½] [4-6] [8-10] [12-14] [16-20]-inch pipe sizes.
- F. Elevated single pipe supports– DURA-BLOK™ DBM Series: [Copper] or [Steel] pipe sizes [¾] [¾] [1] [1¼] [1½] [2]-inch.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions and recommendations.
- B. If gravel top roof, gravel must be removed around and under pipe support.
- C. Always consult roofing manufacturer for roof membrane compression capacities. If necessary, a compatible sheet of roofing material (rubber pad) may be installed under rooftop support to disperse concentrated loads and add further membrane protection.
- D. Gas pipe spacing subject to local gas authorities.
- E. Use properly sized clamps to suit pipe [conduit] sizes.

END OF SECTION

For electronic copy of specification go to
<http://www.cooperbline.com/engineer/specs.asp>

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Phone: 00966 3 812 2236
Fax: 00966 3 812 1291
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www.cooperindustries.com

EXHIBIT A
SCOPE OF SERVICES
[To be attached]

HardiePlank® **HZ10** Lap Siding



EFFECTIVE NOVEMBER 2012

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS

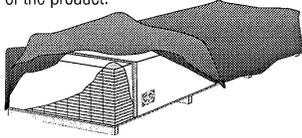
Visit www.jameshardie.com for the most recent version.

**SELECT CEDARMILL® • SMOOTH • CUSTOM COLONIAL™ SMOOTH • CUSTOM COLONIAL™ ROUGHSAWN
CUSTOM BEADED CEDARMILL® • CUSTOM BEADED SMOOTH • STRAIGHT-EDGE SHINGLE PLANK**

IMPORTANT: FAILURE TO INSTALL AND FINISH THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT SYSTEM PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT ONLY WARRANTY. BEFORE INSTALLATION, CONFIRM THAT YOU ARE USING THE CORRECT HARDIEZONE™ PRODUCT INSTRUCTIONS. INSTALLATION OF HZ10® PRODUCTS OUTSIDE AN HZ10® LOCATION WILL VOID YOUR WARRANTY. TO DETERMINE WHICH HARDIEZONE™ APPLIES TO YOUR LOCATION, VISIT WWW.HARDIEZONE.COM OR CALL 1-866-942-7343 (866 9HARDIE)

STORAGE & HANDLING:

Store flat and keep dry and covered prior to installation. Installing siding wet or saturated may result in shrinkage at butt joints. Carry planks on edge. Protect edges and corners from breakage. James Hardie is not responsible for damage caused by improper storage and handling of the product.



⚠ CUTTING INSTRUCTIONS

OUTDOORS

1. Position cutting station so that wind will blow dust away from user and others in working area.
2. Use one of the following methods:
 - a. Best:
 - i. Score and snap
 - ii. Shears (manual, electric or pneumatic)
 - b. Better:
 - i. Dust reducing circular saw equipped with a HardieBlade® saw blade and HEPA vacuum extraction
 - c. Good:
 - i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

INDOORS

1. Cut only using score and snap, or shears (manual, electric or pneumatic).
2. Position cutting station in well-ventilated area

- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
- NEVER dry sweep – Use wet suppression or HEPA Vacuum

Important Note: For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"-level cutting methods where feasible.

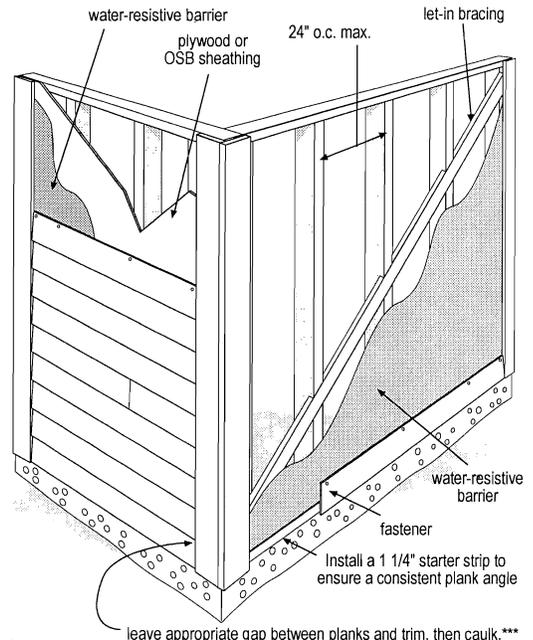
NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

SD083105

GENERAL REQUIREMENTS:

- HardiePlank® lap siding can be installed over braced wood or steel studs spaced a maximum of 24" o.c. or directly to minimum 7/16" thick OSB sheathing. See general fastening requirements. Irregularities in framing and sheathing can mirror through the finished application.
- Information on installing James Hardie products over foam can be located in **JH Tech Bulletin 19** at www.jameshardie.com
- A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. James Hardie will assume no responsibility for water infiltration. James Hardie does manufacture HardieWrap® Weather Barrier, a non-woven non-perforated housewrap¹, which complies with building code requirements.
- When installing James Hardie products all clearance details in figs. 3,4,5,6,7,8,&9 must be followed.
- Adjacent finished grade must slope away from the building in accordance with local building codes - typically a minimum of 6" in the first 10'.
- Do not use HardiePlank lap siding in fascia or trim applications.
- Do not install James Hardie products, such that they may remain in contact with standing water.
- HardiePlank lap siding may be installed on flat vertical wall applications only.
- For larger projects, including commercial and multi-family projects, where the span of the wall is significant in length, the designer and/or architect should take into consideration the coefficient of thermal expansion and moisture movement of the product in their design. These values can be found in the Technical Bulletin "Expansion Characteristics of James Hardie® Siding Products" at www.JamesHardie.com.
- DO NOT use stain on James Hardie® products.

Figure 1 Double Wall Construction Single Wall Construction



INSTALLATION:

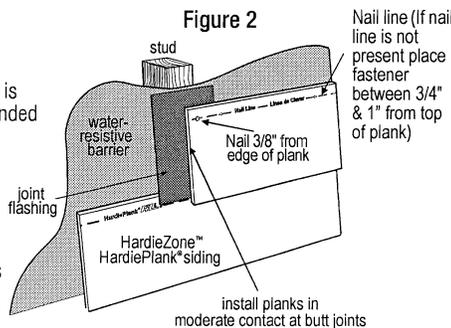
JOINT TREATMENT

- Joint flashing behind field butt joints is required for ColorPlus and recommended for primed products.
- DO NOT Caulk field butt joints on ColorPlus siding.*
- It is OK to Caulk field butt joints on James Hardie primed siding products that is to be field painted.**
- DO caulk where HardiePlank® meets vertical trim.

*Note: Caulking at field butt joints is not recommended for ColorPlus for aesthetic reasons as the caulking and ColorPlus will weather differently. For the same reason, do not caulk nail heads on ColorPlus products.

Note: Field painting over caulking may produce a sheen difference when compared to the field painted PrimePlus. *Refer to Caulking section in these instructions.

¹For additional information on HardieWrap® Weather Barrier, consult James Hardie at 1-866-4Hardie or www.hardiewrap.com



WARNING: AVOID BREATHING SILICA DUST

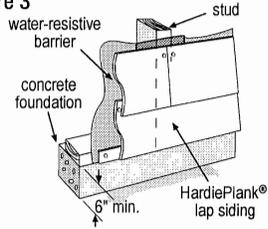
James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade® saw blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area; (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

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CLEARANCES

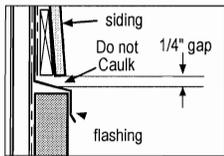
Install siding and trim products in compliance with local building code requirements for clearance between the bottom edge of the siding and the adjacent finished grade.

Figure 3



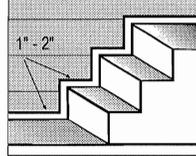
Maintain a 1/4" clearance between the bottom of James Hardie products and horizontal flashing. Do not caulk gap.

Figure 7



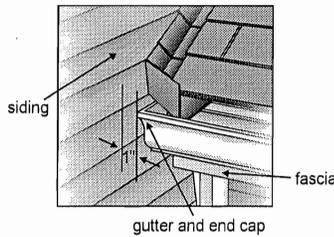
Maintain a 1" - 2" clearance between James Hardie® products and paths, steps and driveways.

Figure 4



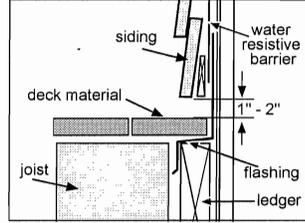
Maintain a minimum 1" gap between gutter end caps and siding & trim.

Figure 8



Maintain a 1" - 2" clearance between James Hardie products and decking material.

Figure 5



At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be installed per the roofing manufacturer's instructions. Provide a 1" - 2" clearance between the roofing and the bottom edge of the siding and trim.

Figure 6

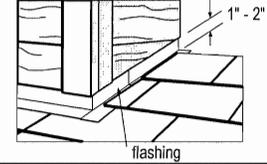


Figure 9

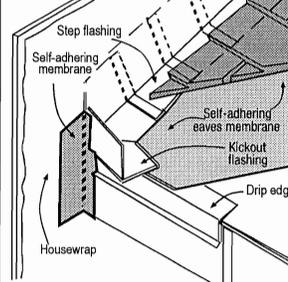


Figure 9, Kickout Flashing† To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" as required by IRC code R905.2.8.3: "... flashing shall be a min. of 4" high and 4" wide." James Hardie recommends the kickout be angled between 100° - 110° to maximize water deflection

KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall. The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding.

It is best to install a self-adhering membrane on the wall before the subsfascia and trim boards are nailed in place, and then come back to install the kickout.

FASTENER REQUIREMENTS **

Blind Nailing is the preferred method of installation for HardiePlank® lap siding products. Face nailing should only be used where required for high wind areas and must not be used in conjunction with Blind nailing (Please see JH Tech bulletin 17 for exemption when doing a repair). **Pin-backed corners may be done for aesthetic purposes Only. Pin-backs shall be done with finish nails only, and are not a substitute for blind or face nailing.**

BLIND NAILING

Nails - Wood Framing

- Siding nail (0.09" shank x 0.221" HD x 2" long)
- 11ga. roofing nail (0.121" shank x 0.371" HD x 1.25" long)

Screws - Steel Framing

- Ribbed Wafer-head or equivalent (No. 8 x 1 1/4" long x 0.375" HD) Screws must penetrate 3 threads into metal framing.

Nails - Steel Framing

- ET & F Panefast® nails or equivalent (0.10" shank x 0.313" HD x 1-1/2" long)
- Nails must penetrate minimum 1/4" into metal framing.

OSB minimum 7/16"

- 11ga. roofing nail (0.121" shank x 0.371" HD x 1.75" long)
- Ribbed Wafer-head or equivalent (No. 8 x 1 5/8" long x 0.375" HD).

FACE NAILING

Nails - Wood Framing

- 6d (0.113" shank x 0.267" HD x 2" long)
- Siding nail (0.09" shank x 0.221" HD x 2" long)

Screws - Steel Framing

- Ribbed Bugle-head or equivalent (No. 8-18 x 1-5/8" long x 0.323" HD) Screws must penetrate 3 threads into metal framing.

Nails - Steel Framing

- ET & F pin or equivalent (0.10" shank x 0.25" HD x 1-1/2" long)
- Nails must penetrate minimum 1/4" into metal framing.

OSB minimum 7/16"

- Siding nail (0.09" shank x 0.221" HD x 1-1/2" long)*

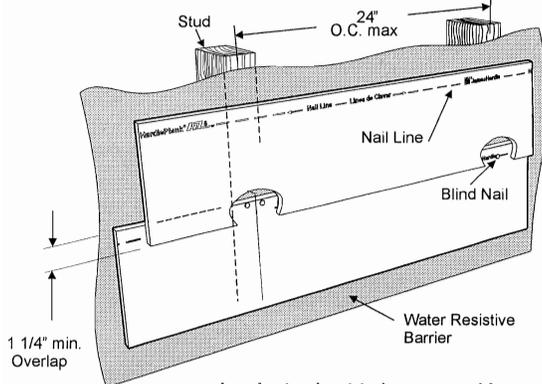


Figure 10

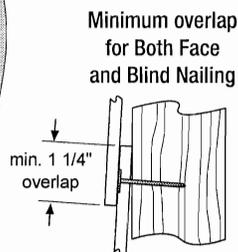
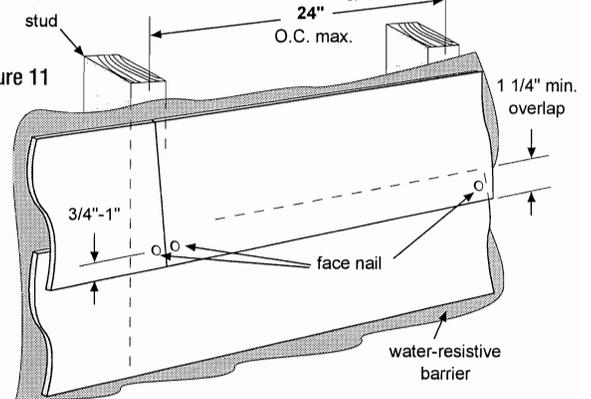


Figure 11



Laminate sheet to be removed immediately after installation of each course for ColorPlus® products.

† The illustration (figure 9) and associated text was reprinted with permission of THE JOURNAL OF LIGHT CONSTRUCTION. For subscription information, visit www.jlconline.com.

* When face nailing to OSB, planks must be no greater than 9 1/4" wide and fasteners must be 12" o.c. or less.

** Also see General Fastening Requirements; and when considering alternative fastening options refer to James Hardie's Technical Bulletin USTB 17 - Fastening Tips for HardiePlank® Lap Siding.

GENERAL FASTENING REQUIREMENTS

Fasteners must be corrosion resistant, galvanized, or stainless steel. Electro-galvanized are acceptable but may exhibit premature corrosion. James Hardie recommends the use of quality, hot-dipped galvanized nails. James Hardie is not responsible for the corrosion resistance of fasteners. Stainless steel fasteners are recommended when installing James Hardie® products near the ocean, large bodies of water, or in very humid climates.

Manufacturers of ACQ and CA preservative-treated wood recommend spacer materials or other physical barriers to prevent direct contact of ACQ or CA preservative-treated wood and aluminum products. Fasteners used to attach HardieTrim Tabs to preservative-treated wood shall be of hot dipped zinc-coated galvanized steel or stainless steel and in accordance to 2009 IRC R317.3 or 2009 IBC 2304.9.5.

- Consult applicable product evaluation or listing for correct fasteners type and placement to achieve specified design wind loads.
- NOTE: Published wind loads may not be applicable to all areas where Local Building Codes have specific jurisdiction. Consult James Hardie Technical Services if you are unsure of applicable compliance documentation.
- Drive fasteners perpendicular to siding and framing.
- Fastener heads should fit snug against siding (no air space). (fig. A)
- Do not over-drive nail heads or drive nails at an angle.
- If nail is countersunk, fill nail hole and add a nail. (fig. B)
- For wood framing, under driven nails should be hit flush to the plank with a hammer (For steel framing, remove and replace nail).
- NOTE: Whenever a structural member is present, HardiePlank should be fastened with even spacing to the structural member. The tables allowing direct to OSB or plywood should only be used when traditional framing is not available.
- **Do not use aluminum fasteners, staples, or clipped head nails.**

PNEUMATIC FASTENING

James Hardie products can be hand nailed or fastened with a pneumatic tool. Pneumatic fastening is highly recommended. Set air pressure so that the fastener is driven snug with the surface of the siding. A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven. If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer - Does not apply for installation to steel framing).



PAINTING

DO NOT use stain on James Hardie® products. James Hardie products must be painted within 180 days for primed product and 90 days for unprimed. 100% acrylic topcoats are recommended. Do not paint when wet. For application rates refer to paint manufacturers specifications. Back-rolling is recommended if the siding is sprayed.

CUT EDGE TREATMENT

Caulk, paint or prime all field cut edges. James Hardie touch-up kits are required to touch-up ColorPlus products.

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions. **Note: OSI Quad as well as some other caulking manufacturers do not allow tooling.**

COLORPLUS® TECHNOLOGY CAULKING, TOUCH-UP & LAMINATE

- Care should be taken when handling and cutting James Hardie ColorPlus products. At the job-site use a soft cloth to gently wipe any residue or construction dust left on the product
- Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch-up applicator. Touch-up should be used sparingly. If large areas require touch-up, replace the damaged area with new HardiePlank® lap siding with ColorPlus Technology.
- Laminate sheet must be removed immediately after installation of each course.
- Terminate non-factory cut edges into trim where possible, and caulk. Color matched caulks are available from your ColorPlus® product dealer.
- Treat all other non-factory cut edges using the ColorPlus Technology edge coat, available from your ColorPlus product dealer.

Note: James Hardie does not warrant the usage of third party touch-up or paints used as touch-up on James Hardie ColorPlus products.

Problems with appearance or performance arising from use of third party touch-up paints or paints used as touch-up that are not James Hardie touch-up, will not be covered under the James Hardie ColorPlus Limited Finish Warranty.

PAINTING JAMES HARDIE® SIDING AND TRIM PRODUCTS WITH COLORPLUS® TECHNOLOGY

When repainting ColorPlus products, James Hardie recommends the following regarding surface preparation and topcoat application:

- Ensure the surface is clean, dry, and free of any dust, dirt, or mildew
- Repriming is normally not necessary
- 100% acrylic topcoats are recommended
- DO NOT use stain or oil/alkyd base paints on James Hardie® products
- Apply finish coat in accordance with paint manufacturers written instructions regarding coverage, application methods, and application temperature
- DO NOT caulk nail heads when using ColorPlus products, refer to the ColorPlus touch-up section



COVERAGE CHART/ESTIMATING GUIDE

Number of 12' planks, does not include waste

COVERAGE AREA LESS OPENINGS		HARDIEPLANK® LAP SIDING WIDTH								
SQ (1 SQ = 100 sq.ft.)	(exposure)	5 1/4 4	6 1/4 5	7 1/4 6	7 1/2 6 1/4	8 6 3/4	8 1/4 7	9 1/4 8	9 1/2 8 1/4	12 10 3/4
1		25	20	17	16	15	14	13	13	9
2		50	40	33	32	30	29	25	25	19
3		75	60	50	48	44	43	38	38	28
4		100	80	67	64	59	57	50	50	37
5		125	100	83	80	74	71	63	63	47
6		150	120	100	96	89	86	75	75	56
7		175	140	117	112	104	100	88	88	65
8		200	160	133	128	119	114	100	100	74
9		225	180	150	144	133	129	113	113	84
10		250	200	167	160	148	143	125	125	93
11		275	220	183	176	163	157	138	138	102
12		300	240	200	192	178	171	150	150	112
13		325	260	217	208	193	186	163	163	121
14		350	280	233	224	207	200	175	175	130
15		375	300	250	240	222	214	188	188	140
16		400	320	267	256	237	229	200	200	149
17		425	340	283	272	252	243	213	213	158
18		450	360	300	288	267	257	225	225	167
19		475	380	317	304	281	271	238	238	177
20		500	400	333	320	296	286	250	250	186

This coverage chart is meant as a guide. Actual usage is subject to variables such as building design. James Hardie does not assume responsibility for over or under ordering of product.

RECOGNITION: In accordance with ICC-ES Legacy Report NER-405, HardiePlank® lap siding is recognized as a suitable alternate to that specified in: the BOCA National Building Code/1999, the 1997 Standard Building Code, the 1997 Uniform Building Code, the 1998 International One- and Two-Family Dwelling Code, the 2003 International Building Code, and the 2003 International Residential Code for One- and Two-Family Dwellings. HardiePlank lap siding is also recognized for application in the following: City of Los Angeles Research Report No. 24862, State of Florida listing FL#889, Dade County, Florida NOA No. 02-0729.02, U.S. Dept. of HUD Materials Release 1263c, Texas Department of Insurance Product Evaluation EC-23, City of New York MEA 223-93-M, and California DSA PA-019. These documents should also be consulted for additional information concerning the suitability of this product for specific applications.

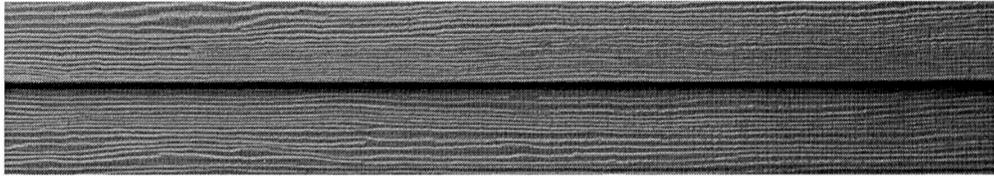
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Additional Installation Information,
Warranties, and Warnings are available at
www.jameshardie.com



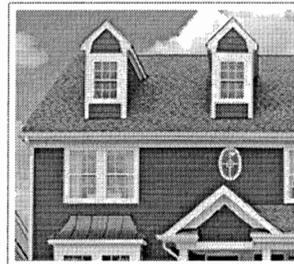
JamesHardie

Panelfast is a registered trademark of ET&F Fastening Systems, Inc.



Products / Exterior / HardiePlank® Lap Siding

HardiePlank® lap siding is the most popular brand of siding in America and can be found on over 5.5 million homes. With its strength, beauty and durability, HardiePlank® siding enhances and protects homes in all kinds of climates—and now, with the [HardieZone® System](#), James Hardie provides siding with specific performance attributes relative to the climate where the product is being used. James Hardie now gives you the optimum siding for your home and climate, regardless of location.



All HardiePlank® lap siding comes in a variety of looks and textures, all of which are engineered for climate. We are so sure about how well the HardieZone system will perform, HardiePlank® lap siding comes with a 30-year nonprorated, transferable, limited warranty—our strongest warranty ever

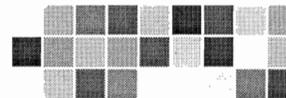
- PRODUCT INFORMATION
- WARRANTY
- INSTALLATION
- FAQ

[Click here to view all products.](#)

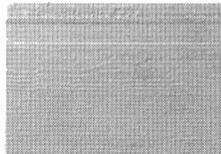
Please enter your zip or postal code to see what products are available in your area.

Zip/Postal Code:

Color Palette



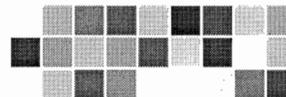
Custom Colonial™ Roughsawn

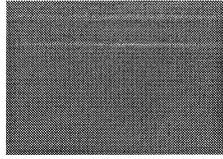


Thickness: 5/16"
 Weight: 2.3 lbs./sq. ft
 Length: 12' planks

WIDTH 8.000"
 EXPOSURE 6.75"
 COLOR MATCH
 PRIMED

Color Palette

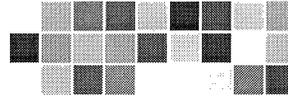




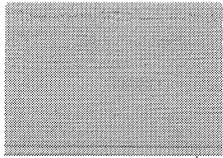
Thickness: 5/16"
 Weight: 2.3 lbs./sq. ft
 Length: 12' planks

WIDTHS 8.000"
 EXPOSURE 6.75"
 COLORPLUSES
 PRIMED

Color Palette



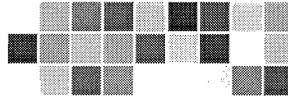
Custom Beaded Cedarmill®



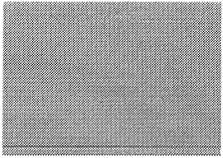
Thickness: 5/16"
 Weight: 2.3 lbs./sq. ft
 Length: 12' planks

WIDTHS 8.250"
 EXPOSURE 7.0"
 COLORPLUSES
 PRIMED

Color Palette



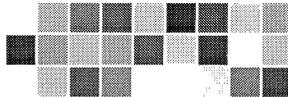
Custom Beaded Smooth



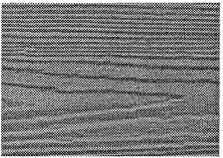
Thickness: 5/16"
 Weight: 2.3 lbs./sq. ft
 Length: 12' planks

WIDTHS 8.250"
 EXPOSURE 7.0"
 COLORPLUSES
 PRIMED

Color Palette



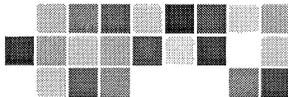
Select Cedarmill® C+

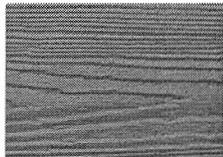


Thickness: 5/16"
 Weight: 2.3 lbs./sq. ft
 Length: 12' planks

WIDTHS	5.250"	5.250"	7.250"	8.250"
EXPOSURE	4.0"	5.0"	6.0"	7.0"
COLORPLUSES	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PRIMED	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

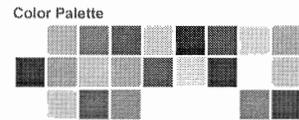
Color Palette



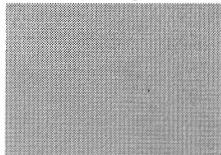


Thickness: 5/16"
Weight: 2.3 lbs./sq. ft.
Length: 12' planks

WIDTHS	5.250"	6.250"	7.250"	8.250"	9.250"
12.000"					
EXPOSURE	4.0"	5.0"	6.0"	7.0"	8.0"
10.75"					
COLORPLUS®	✓	✓	✓	✓	
PRIMED	✓	✓	✓	✓	✓

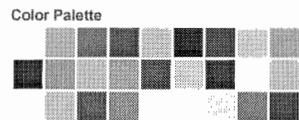


Smooth Lap Siding C+

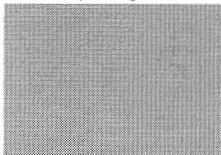


Thickness: 5/16"
Weight: 2.3 lbs./sq. ft.
Length: 12' planks

WIDTHS	5.250"	6.250"	7.250"	8.250"
EXPOSURE	4.0"	5.0"	6.0"	7.0"
COLORPLUS®	✓	✓	✓	✓
PRIMED	✓	✓	✓	✓

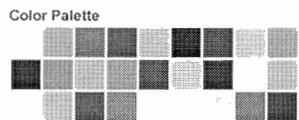


Smooth Lap Siding



Thickness: 5/16"
Weight: 2.3 lbs./sq. ft.
Length: 12' planks

WIDTHS	5.250"	6.250"	7.250"	8.250"	9.250"
12.000"					
EXPOSURE	4.0"	5.0"	6.0"	7.0"	8.0"
10.75"					
COLORPLUS®	✓	✓	✓	✓	
PRIMED	✓	✓	✓	✓	✓

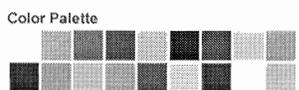


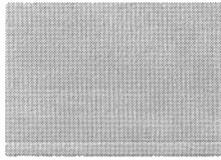
Beaded Cedarmill®



Thickness: 5/16"
Weight: 2.3 lbs./sq. ft.
Length: 12' planks

WIDTHS	8.250"
EXPOSURE	7.0"
COLORPLUS®	✓
PRIMED	✓



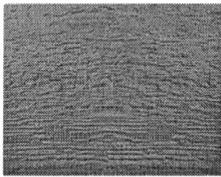


Thickness: 5/16"
Weight: 2.3 lbs./sq. ft
Length: 12' planks

WIDTHS 8.250"
EXPOSURE 7.0"
COLORPLUS
PRIMED

This product is not available in ColorPlus® colors in this area.

Rustic Cedar



Thickness: 5/16"
Weight: 2.3 lbs./sq. ft
Length: 12' planks

WIDTHS 6.250" 8.250"
EXPOSURE 5.0" 7.0"
PRIMED

4/4, 5/4

HardieTrim® H710 Boards

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS



JamesHardie

EFFECTIVE NOVEMBER 2012

Visit www.jameshardie.com for the most recent version.

These instructions are to be used for **HardieTrim® HZ10® Boards ONLY** and are **NOT VALID** in the following states: AK, HI, UT, ID, CO, WY, MT. These instructions are also NOT valid in portions of WA, OR, CA, NV, AZ, NM. Enter your zip code at www.hardiezone.com to find out what zone applies to your location.

IMPORTANT: FAILURE TO INSTALL AND FINISH THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT SYSTEM PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT ONLY WARRANTY. BEFORE INSTALLATION, CONFIRM THAT YOU ARE USING THE CORRECT HARDIEZONE INSTRUCTIONS. INSTALLATION OF HZ10™ PRODUCTS OUTSIDE AN HZ10™ LOCATION WILL VOID YOUR WARRANTY. TO DETERMINE WHICH HARDIEZONE APPLIES TO YOUR LOCATION, VISIT WWW.HARDIEZONE.COM OR CALL 1-866-942-7343 (866 9HARDIE)

STORAGE & HANDLING:

Store flat and keep dry and covered prior to installation. Installing siding wet or saturated may result in shrinkage at butt joints. Carry product on edge. Protect edges and corners from breakage. James Hardie is not responsible for damage caused by improper storage and handling of the product.



⚠ CUTTING INSTRUCTIONS

OUTDOORS

1. Position cutting station so that wind will blow dust away from user and others in working area.
2. Use one of the following methods:
 - b. Better:
 - i. Dust reducing circular saw equipped with a HardieBlade® saw blade and HEPA vacuum extraction
 - c. Good:
 - i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

INDOORS

- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
- NEVER dry sweep – Use wet suppression or HEPA Vacuum

Important Note: For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"-level cutting methods where feasible. NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

SD083105

HardieTrim® 4/4,5/4 boards are decorative non-load bearing trim products.

GENERAL REQUIREMENTS:

- Wood or steel backing must be provided for attaching HardieTrim® boards.
- A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. James Hardie will assume no responsibility for water infiltration. James Hardie does manufacture HardieWrap® Weather Barrier, a non-woven non-perforated housewrap¹, which complies with building code requirements.
- When installing James Hardie products all clearance details in figs. 5, 6, 7, 8, & 9 must be followed.
- Flashing is required over all horizontal protruding and exposed trim.
- Adjacent finished grade must slope away from the building in accordance with local building codes - typically a minimum of 6" in the first 10'.
- DO NOT install HardieTrim boards, such that they may remain in contact with standing water.
- DO NOT use stain on James Hardie® products.

INSTALLATION

HardieTrim may be installed using traditional fastening method or by concealed fastening method.

Traditional Fastener Requirements

Use 2" minimum 16 ga. finish nails to attach HardieTrim boards to wood frame construction. ET&F or equivalent fasteners or screws may be used to attach HardieTrim boards to steel frame construction.

Fastening instructions are similar for all applications. When using finish nails, position nails no closer than 1/2" from the edges of the trim and for all other fasteners no closer than 3/4". Fasteners must be no closer than 1" from ends of trim and spaced a maximum of 16" o.c. Ensure trim is adequately fastened.

James Hardie recommends using stainless steel finish nails when installing HardieTrim (Trim, Battens, Fascia, etc.) products.

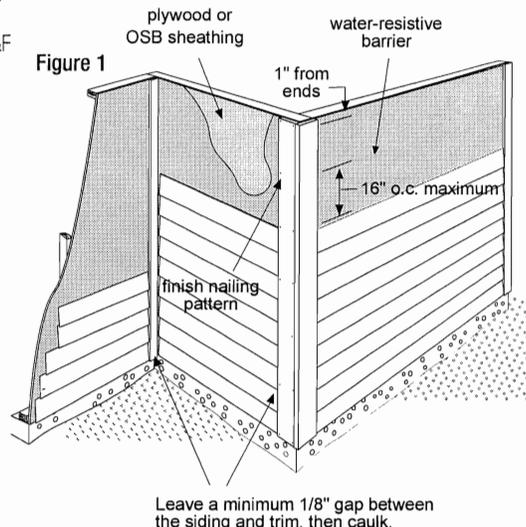
Minimum fastener guide for finish nailing:

	Pre-built corner	Site Built Corners	Other areas (e.g. window trim, band boards and fascia)
4"	1 nail every 16" to attach boards together + 1 nail every 16" each board	2 nails every 16"	2 nails every 16"
6"	1 nail every 16" to attach boards together + 2 nails every 16" each board		
8"	-	3 nails every 16"	3 nails every 16"
12"	-	4 nails every 16"	3 nails every 16"

Use a 2" finish nail to fasten trim together. Longer finish nails may bend.

HardieTrim 4/4 and 5/4 Boards with ColorPlus® Technology: A finish nail is required for installing HardieTrim 4/4 and 5/4 boards. Remove laminate sheet as soon as possible after nailing. Nail head touch up can be done before or after removal of the laminate sheet when using finish nails. The preferred method is to touch-up while the laminate sheet is in place. Remove the laminate sheet before paint dries.

¹ For additional information on HardieWrap™ Weather Barrier, consult James Hardie at 1-866-4Hardie or www.hardiewrap.com



WARNING: AVOID BREATHING SILICA DUST

James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade® saw blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area; (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

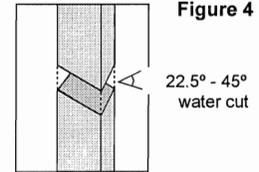
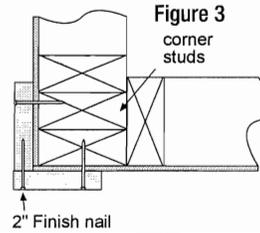
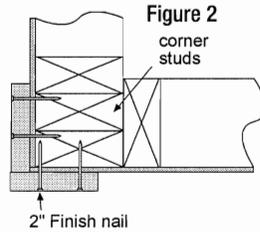
SD050906

TRIMMING CORNERS

When installing corners or other vertical trim, position boards on the wall and attach (fig. 2). Use weather cuts sloped away from the wall to join (fig. 4). Alternatively corners can be pre-built (fig. 3).

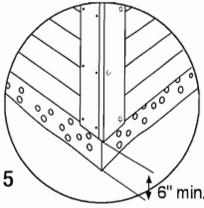
Pre-Built Corners

Corners can be pre-built off the wall using 2" finishing nails. Each side of the pre-built corner must be secured to the wall (fig. 2).



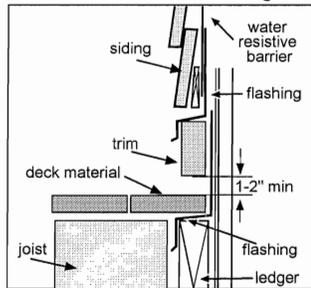
CLEARANCES

Install siding and trim products in compliance with local building code requirements for clearance between the bottom edge of the siding and the adjacent finished grade.



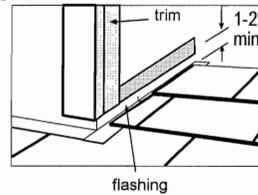
Maintain a minimum 1-2" clearance between James Hardie® trim products and decks, paths, steps and driveways.

Figure 6



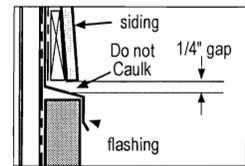
At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be installed per the roofing manufacturer's instructions. Provide a 1-2" clearance between the roofing and the bottom edge of the trim.

Figure 7



Maintain a 1/4" clearance between the bottom of James Hardie® products and horizontal flashing. Do not caulk gap.

Figure 8



Maintain a minimum 1" gap between gutter end caps and siding & trim.

Figure 9

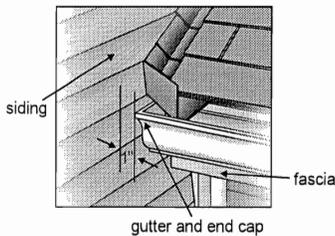
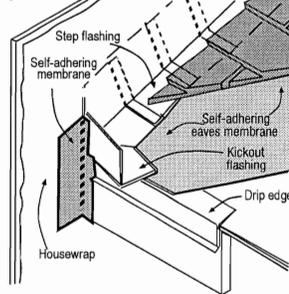


Figure 10



KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall. The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding.

It is best to install a self-adhering membrane on the wall before the subsfascia and trim boards are nailed in place, and then come back to install the kickout.

Figure 10, Kickout Flashing† To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" as required by IRC code R905.2.8.3 ". . .flashing shall be a min. of 4" high and 4" wide." James Hardie recommends the kickout be angled between 100° - 110° to maximize water deflection.

TRIM APPLICATION FOR WINDOWS, DOORS & OTHER OPENINGS

Flashing over trim is required for all installation methods. (fig. 11)

Butt Joint to Siding

Trim the opening prior to the installation of the siding. Position trim boards on the wall and secure. Allow proper fastener spacing at edges and ends.

Figure 12

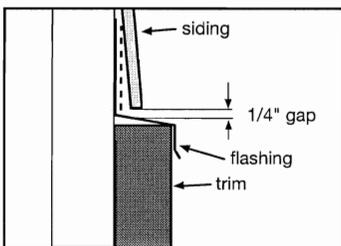
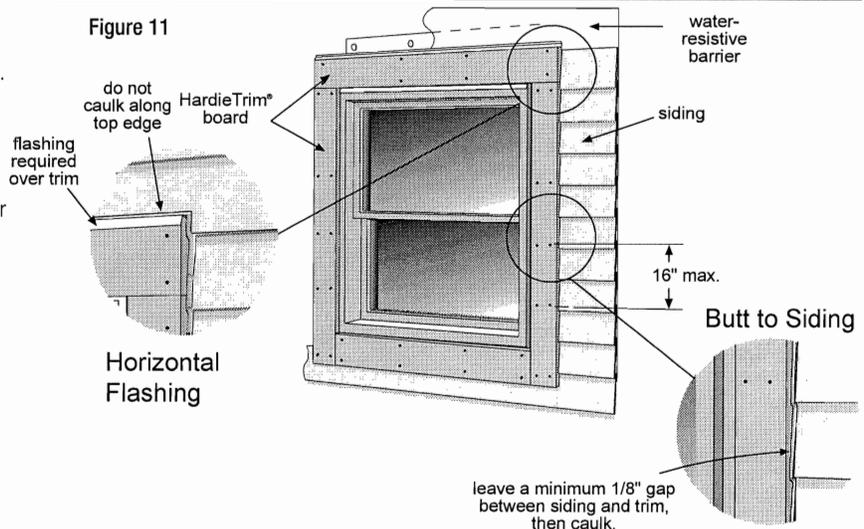


Figure 11



NOTE: Follow your window/door manufacturer's installation instructions.

† The illustration (figure 10) was reprinted with permission of THE JOURNAL OF LIGHT CONSTRUCTION. For subscription information, visit www.jlconline.com.

BAND BOARDS, FRIEZE BOARDS, RAKE TRIM & FASCIA

HardieTrim® boards may also be used as band boards, frieze boards, rake trim or fascia (fig. 13 & 14).

Figure 13

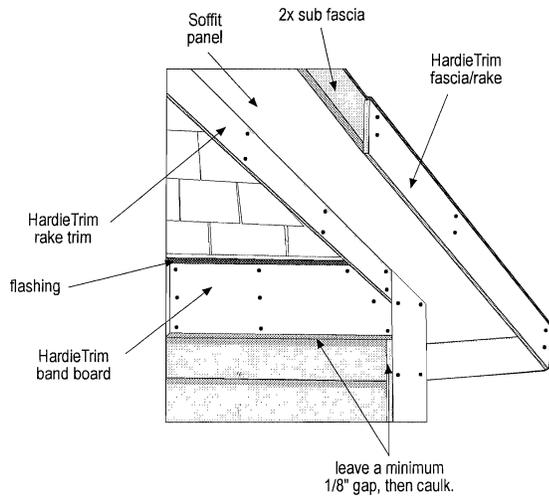
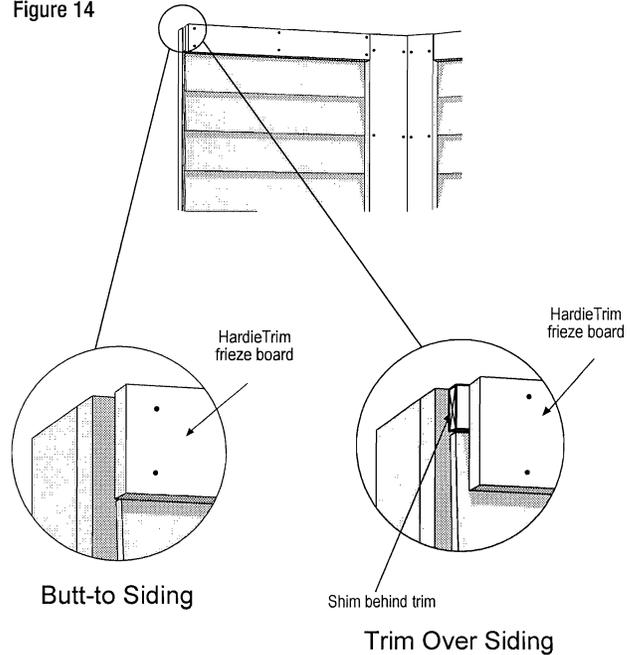


Figure 14



FASCIA

For fascia applications, a flashing is required over top of the fascia (fig. 15).

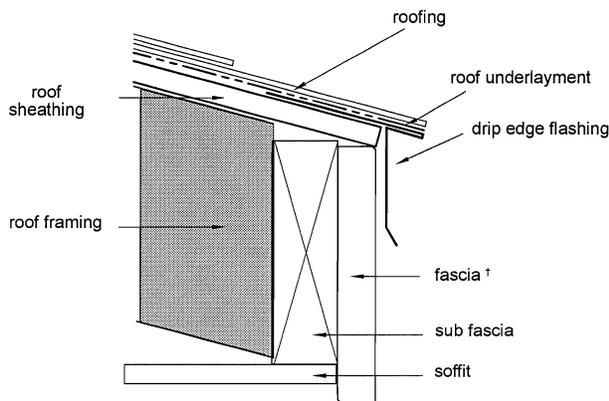


Figure 15

† Ensure adequate fastening of fascia

BAND BOARD

For band board applications, a flashing is required over the trim (fig. 16).

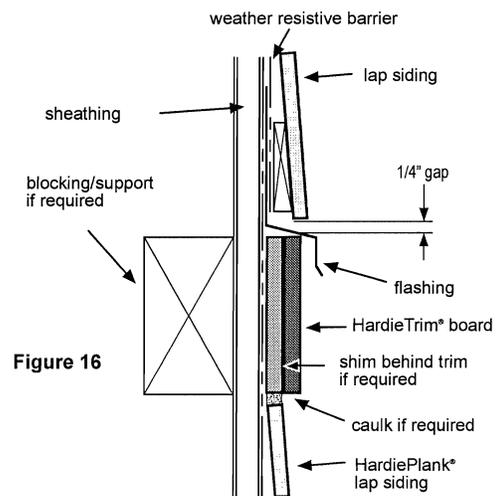


Figure 16

CONCEALED FASTENING TABS

For Corners, Band Boards, Windows, and Door Applications:

HardieTrim® boards can be installed with Flat Tabs (JH sku no. 280154) and Corner Tabs (JH sku no. 280155) which provide concealed fastening. Only Flat and Corner Tabs can be used with HardieTrim® boards to create a concealed fastening. Additional framing may be required to ensure the Flat and Corner Tabs are fastened properly to the structure. Special attention should be paid to the framing when using a sheathing that does not have fastener holding equivalent to OSB or Plywood sheathing.

Step 1: Attach Flat Tabs to the back side of the trim with 4 18 ga. 1/2" L x 1/4" W narrow crown corrosion resistant staples, equally spaced in one row, positioned no closer than 1/2" from trim edges, using a pneumatic staple gun. (Figure 19)

Step 2: For wood frame construction, attach the trim to the building using 2, 6d siding nails fastened through the Flat Tabs. ET&F or equivalent fasteners may be used to attach the Flat Tabs to steel frame construction. (Figures 20)

Fastener spacing will vary based on application. Refer to specific sections in these instructions for required fastener spacing by application (window, band board, etc.) Refer to fastener table on page 6

Figure 19

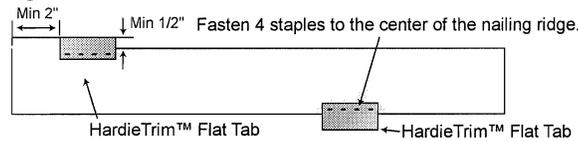
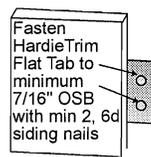


Figure 20



Installation of HardieTrim tabs in Coastal Regions:

James Hardie requires that stainless steel staples & fasteners be used when installing HardieTrim™ Tabs in coastal regions.

Installation of HardieTrim Tabs over Pressure Treated Lumber:

HardieTrim™ tabs shall not come in direct contact with ACQ or CA preservative-treated wood. Refer to the General Fastening section of this document for further information.

HardieTrim® NT3™ boards with ColorPlus® Technology

Remove the laminate sheet as soon as possible after attaching the trim to the building.

TRIMMING CORNERS

HardieTrim® boards are installed around corners by pre-building the corner off the wall with the Corner Tabs (JH sku no. 280155).

- Attach Corner Tabs to the back side of the trim with 8 18 ga. 1/2" L x 1/4" W narrow crown corrosion resistant staples using a pneumatic staple gun. Ensure the Corner Tabs are fastened tight and straight to the trim boards. (Figure 21)
- For wood frame construction, attach the trim to the building with 2, 6d siding nails fastened through the Corner Tabs. ET&F or equivalent fasteners may be used to attach the Corner Tabs to steel frame construction. (Figure 22)
- Attach a Corner Tab 1" from each edge and every 20" o.c.
- TIP: Creating a jig for the work station is recommended to ensure the corners are fastened securely and straight. (Figure 24)

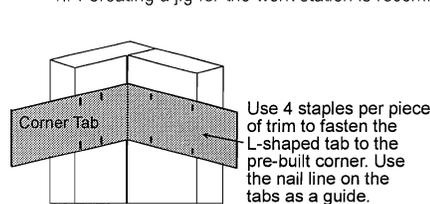


Figure 21

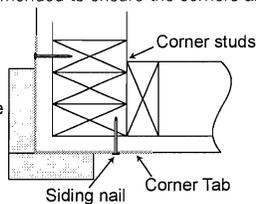


Figure 22

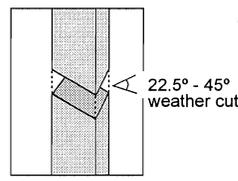


Figure 23

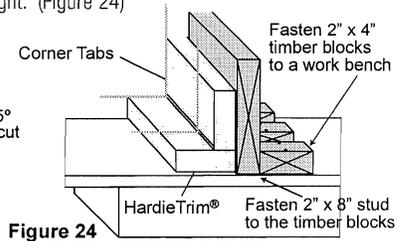
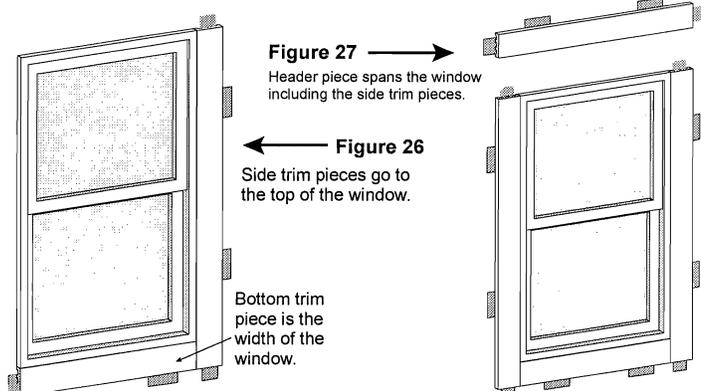


Figure 24

TRIM APPLICATION FOR WINDOWS, DOORS & OTHER OPENINGS

Trim the opening prior to the installation of the siding (Figure 26). Place a Flat Tab at the end of each trim board and one tab every 16" OC. Attach the trim boards and Flat Tabs around the opening as shown in Figures 26 and 27. Use 16 ga. galvanized 2" long finish nails to ensure proper fastening if needed.



NOTE: Follow your window/door manufacturers installation instructions.

BAND BOARD

A flashing is required over the trim and Flat Tabs. (Figure 29) Terminate ends of the Band Board into Trim or Siding or miter cut the edges of the trim at the corners of the building. Place a Flat Tab at the end of each trim board and one tab every stud at a maximum of 16" o.c. The Flat Tabs should be attached to the trim in an alternating pattern to the top and bottom of the band board (Figure 30 and 31). Use 16 ga. galvanized 2" long finish nails to ensure proper fastening if needed.

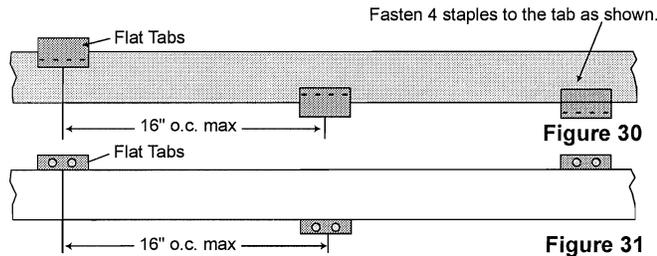
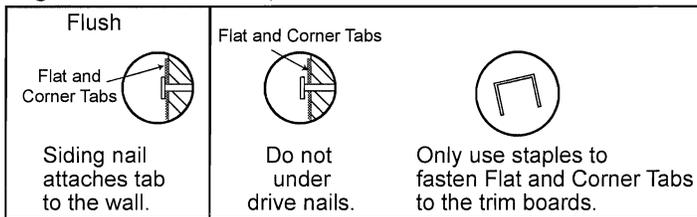


Figure 32



* Refer to your paint manufacturer for washing and recoating requirements related to paint performance.

GENERAL FASTENING REQUIREMENTS

Fasteners must be corrosion resistant, galvanized, or stainless steel. Electro-galvanized are acceptable but may exhibit premature corrosion. James Hardie recommends the use of quality, hot-dipped galvanized nails. James Hardie is not responsible for the corrosion resistance of fasteners. Stainless steel fasteners are recommended when installing James Hardie® products near the ocean, large bodies of water, or in very humid climates.

Manufacturers of ACQ and CA preservative-treated wood recommend spacer materials or other physical barriers to prevent direct contact of ACQ or CA preservative-treated wood and aluminum products. Fasteners used to attach HardieTrim Tabs to preservative-treated wood shall be of hot dipped zinc-coated galvanized steel or stainless steel and in accordance to 2009 IRC R317.3 or 2009 IBC 2304.9.5."

- Drive fasteners perpendicular to trim and framing.
- Fastener heads should fit snug against siding (no air space). (fig. B)
- Do not over-drive nail heads or drive nails at an angle.
- If nail is countersunk, caulk nail hole and add a nail.
- For wood framing, under driven nails should be hit flush to the trim with a hammer (For steel framing, remove and replace nail).
- **Do not use aluminum fasteners, staples, or clipped head nails.**

PNEUMATIC FASTENING

HardieTrim® Trim can be hand nailed or fastened with a pneumatic tool. Pneumatic fastening is highly recommended. Finish nails should be driven flush to the trim (fig. A). When using siding nails set air pressure so that the fastener is driven snug with the surface of the siding (fig. B). A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven. If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer - Does not apply for installation to steel framing).

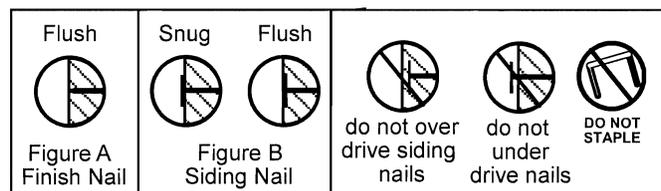
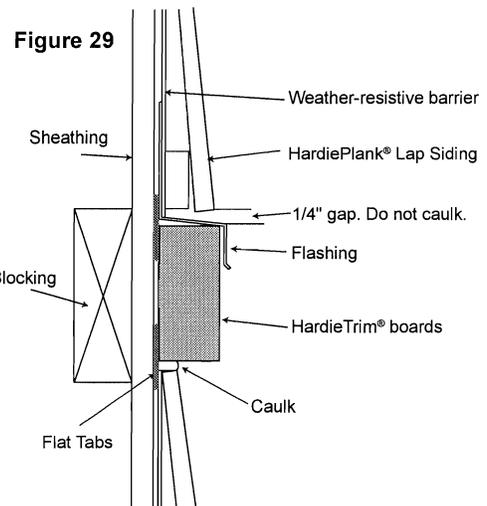
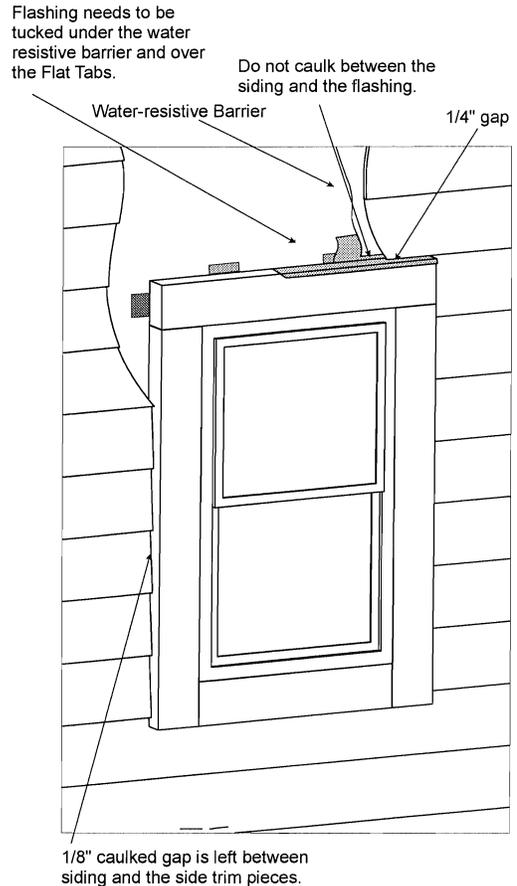


Figure 28



CUT EDGE TREATMENT

Caulk, paint or prime all field cut edges. James Hardie touch-up kits are required to touch-up ColorPlus products.

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions. **Note: OSI Quad as well as some other caulking manufacturers do not allow tooling.**

COLORPLUS® TECHNOLOGY CAULKING, TOUCH-UP & LAMINATE

- Care should be taken when handling and cutting James Hardie ColorPlus products. At the job-site use a soft cloth to gently wipe any residue or construction dust left on the product
- Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch-up applicator. Touch-up should be used sparingly. If large areas require touch-up, replace the damaged area with new HardiePlank® lap siding with ColorPlus Technology.
- Laminate sheet must be removed immediately after installation of each course.
- Terminate non-factory cut edges into trim where possible, and caulk. Color matched caulks are available from your ColorPlus® product dealer.
- Treat all other non-factory cut edges using the ColorPlus Technology edge coat, available from your ColorPlus product dealer.

Note: James Hardie does not warrant the usage of third party touch-up or paints used as touch-up on James Hardie ColorPlus products.

Problems with appearance or performance arising from use of third party touch-up paints or paints used as touch-up that are not James Hardie touch-up, will not be covered under the James Hardie ColorPlus Limited Finish Warranty.

PAINTING JAMES HARDIE® SIDING AND TRIM PRODUCTS WITH COLORPLUS® TECHNOLOGY

When repainting ColorPlus products, James Hardie recommends the following regarding surface preparation and topcoat application:

- Ensure the surface is clean, dry, and free of any dust, dirt, or mildew
- Repriming is normally not necessary
- 100% acrylic topcoats are recommended
- DO NOT use stain or oil/alkyd base paints on James Hardie® products
- Apply finish coat in accordance with paint manufacturers written instructions regarding coverage, application methods, and application temperature
- DO NOT caulk nail heads when using ColorPlus products, refer to the ColorPlus touch-up section

FASTENER TABLE

Application	Framing Material Tab is nailed into	Fastener (tab to framing)	Fastener (tab to Hardietrim)	Max Tab Spacing (inches on center)
Flat Tab	Wood Stud (minimum G=0.42)	One 6d corrosion resistant siding nail installed through center of flange into framing	Four 18 ga. X 1/2" long X 1/4" wide corrosion resistant crown staples, equally spaced in one row	16
	Minimum APA rated 7/16" OSB	Two 4d ring shank corrosion resistant siding nails equally spaced installed through flange into framing		
	Minimum 20 gauge steel	One No. 8 X 1" long X 0.323" head diameter screw (corrosion resistant) installed through flange into framing		
Corner Tab	Wood Stud (minimum G=0.42)	On each flange, install one 6d corrosion resistant siding nail through flange into framing	For each piece of trim, install Four 18 ga. X 1/2" long X 1/4" wide corrosion resistant crown staples, equally space in two rows	20
	Minimum APA rated 7/16" OSB	On each flange, install two 4d ring shank corrosion resistant siding nails through flange into framing		
	Minimum 20 gauge steel	On each flange, install one No. 8 X 1" long X 0.323" head diameter screw (corrosion resistant) through flange into framing		

Wind-Borne Debris Region: "Supplemental fasteners may be necessary when installing tabs in a Wind-Borne Debris Region, please call Technical Services 800-942-7343 with any questions."

RECOGNITION: HardieTrim boards may be installed as an equal alternative to conventional trim permitted for use in; the 1997 Uniform Building Code, Section 601.5.5; the 1997 Standard Building Code, Section 1404.1; the 1999 BOCA National Building Code, Section 1407.2.2; 2003 International Building Code, Section 1402.1, the 2003 International Residence Code for One - and Two - Family - Dwellings, Section R703.1, the 2003 International Residence Code for One - and Two - Family - Dwellings, Section R703.1, and the 1998 International One-and -Two -Family Dwelling Code, Section 601.1.

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Additional Installation Information, Warranties, and Warnings are available at www.jameshardie.com



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 Schoolcraft, MI 49087
www.chemlink.com

Last Revision: 01/24/13
 Document No. L1350

Product Description

E-Curb penetration seals replace old-style metal pitch pans with versatile, precast components and pourable sealants. CHEM LINK's **E-Curb** System can usually be installed in under 15 minutes and never requires flashing or mechanical attachment.

E-Curbs are designed for use on granulated modified bitumen, asphalt and coal tar B.U.R. (built up roofing). **E-Curbs** are specified for PVC, EPDM, PIB, and TPO single ply roofing membranes. **E-Curbs** are highly versatile for sealing penetrations around solar panel mounts, HVAC, Electrical, and any type of structural supports. TPO Primer is required for use with TPO single-ply roof membrane.

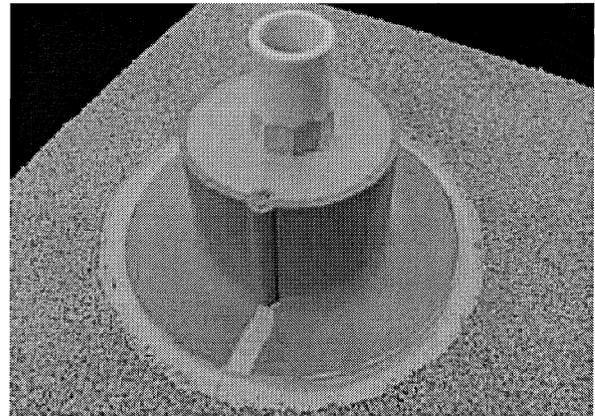
When installed properly, this system forms a durable, waterproof rubber seal around penetrations. An extended manufacture warranty against leaks is activated with submittal of a completed warranty card.

Special Characteristics

- Rapid installation - "Slip-fit" light weight curb design reduces labor significantly.
- Excellent adhesion to most roofing materials.
- No flashing or mechanical attachment required.
- Service Temperature -40°F to 200°F (-40°C to 93°C)
- **1-Part**[®] accommodates movement and is suggested for use on all granulated membranes and details with excessive movement.
- For sloped roof applications, substitute **DuraLink**[™] non-slump adhesive/sealant for **1-Part** and **M-1**[®]

Restrictions

- Do not apply below 30°F (-1°C)
- Do not install if rain is anticipated within 4 hours
- Do not use on Hypalon or smooth APP modified bitumen membrane. For smooth APP, torch down a target of granulated APP before installation.
- TPO Primer must be used for TPO applications.
- Do not prime bonding surfaces with asphalt primer!
- Do not use asphalt cement as a "night sealant." Use **M-1** for this purpose.
- **E-Curb** kits are designed to contain enough 1-Part to fill each curb with displacement in consideration. Refer to our penetration calculator under contractor resources at chemlink.com to verify volumes.



E-Curb System Components

- **E-Curb** exterior rings, straights, and corners.
- **M-1** Structural Adhesive/Sealant used for bonding the **E-Curb** components, sealing and priming the penetration.
- **1-Part** "moisture cure" pourable sealer, used to form a durable, water-tight seal around the roof penetration.

E-Curb precast form components are composed of light weight nylon resin. The E-Curb is 2 inches high and is available in a variety of shapes and sizes. Sizes available include: bi-sected circular pieces having inside diameters of 3, 4, 6, or 9 inches. Corner pieces having a 2-inch radius, and 8-inch straight pieces are also available to create larger sizes. The outer surface is impervious to ice, corrosion, UV (ultraviolet light) and ponding water.

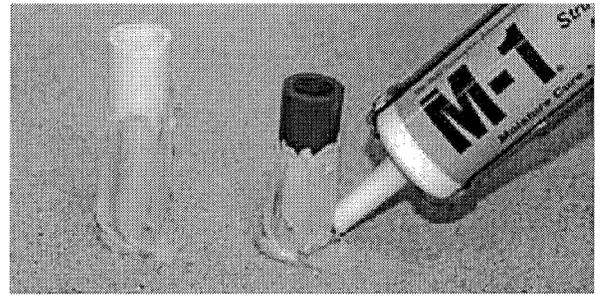
M-1 Structural Adhesive/Sealant is a durable, self-fixturing moisture cure mastic. Cartridges of **M-1** are supplied in each E-Curb Kit. Components are also sold separately.

1-Part is a highly flexible, self-leveling moisture cure pourable sealer that eliminates mixing. It is also 100% solid rubber, has a very low VOC content, will not melt or shrink, and is resistant to deterioration. It is supplied in 10.1-oz and 28-oz cartridges or 1/2 gallon pouches. Unused sealant can be capped and reused.



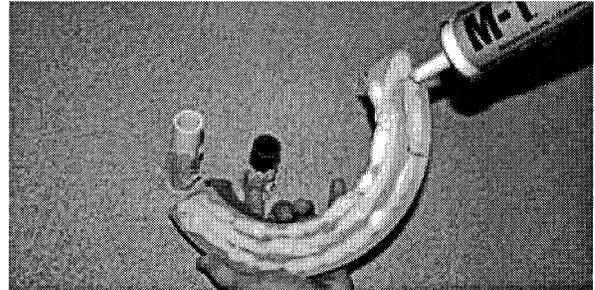
Step 1

Remove all previously applied caulk, mastic, cement, asphalt, and other contaminants from penetrations with a wire brush. Clean all smooth substrates with isopropyl or denatured alcohol. Brush away all gravel or loose granules. Seal the base of each penetration with **M-1**. Coat penetrations with **M-1** to 3" above the roof line.



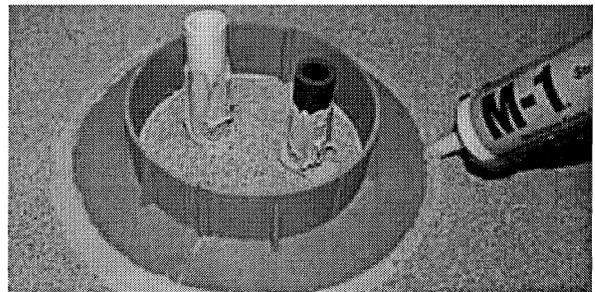
Step 2

Hold a section of **E-Curb**, flat side up, and apply a 1/4" bead of **M-1** to the entire bottom perimeter. Apply 1 additional 1/4" bead of **M-1** down the center of the section. Do not tool the beads flat. Place the **E-Curb** section on the roof surface to form a half circle around the penetration(s). Press down firmly until **M-1** extrudes from the outside edges.



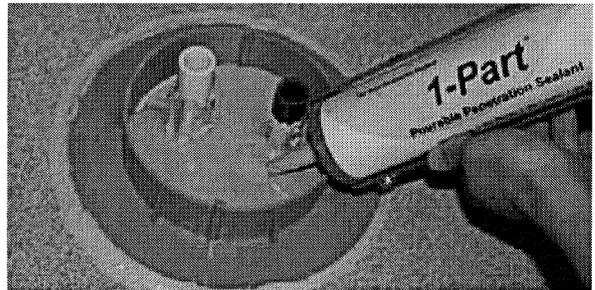
Step 3

Apply **M-1** to the second section of **E-Curb** as described above. Place the second section of curb on the roof surface to form a circle with the first section. Press firmly in place until excess adhesive extrudes from the outside edges. Apply a bead of **M-1** around the outside base of the installed **E-Curb**, and tool to form a smooth fillet. For non **E-Curb** penetrations seals, add **M-1** to scarf joint surfaces and tool smooth.



Step 4

Cut tip off **1-Part** cartridge at widest point on plastic nozzle and pierce the foil seal. Insert into caulking gun and pump **E-Curb** full. When using a **1-Part** pouch, remove cap, pour, squeeze out excess air, and reseal. **Note:** To provide an adequate rubber seal, maintain a 1" distance between penetrations and inside edge of the E-Curb.



All properties described in this document are derived from testing conducted in laboratory conditions. Properties and performance will vary depending on environmental conditions and application technique. Test and evaluate to determine appropriate usage. Visit www.chemlink.com for the Material Safety Data Sheet, Technical Data Guides and full warranty for this product.

LIMITED WARRANTY: **CHEM LINK Products, LLC** warrants this product's performance, provided it is properly stored and applied within 1 year. If not satisfied, return remaining product and purchase receipt for refund or replacement of product exclusive of labor or cost of labor. This is the sole and exclusive remedy for defects or failure of this product. User must read and follow the direction of the current Technical Data Guide and MSDS prior to product use. User determines suitability of product for intended use and assumes all risks. Manufacturer shall not be liable for damages (including consequential or incidental damages) in excess of the purchase price, except where such exclusion or limitation is prohibited by state law. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, WRITTEN OR ORAL, STATUTORY, EXPRESS OR IMPLIED INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE; except for the above express warranty given by manufacturer, the product is sold with all faults. **CHEM LINK PRODUCTS, LLC** SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS. This warranty gives you specific legal rights, and you may also have other rights in the U.S. which vary from state to state. For warranty claim information, call 800-826-1681.



CHEM LINK E-CURB™ PENETRATION SEAL

DIVISION 7- THERMAL AND MOISTURE PROTECTION

SECTION 07 72 00 ROOF ACCESSORIES

SECTION 07 72 13 MANUFACTURED CURBS

PART 1 – GENERAL APPLICATION SPECIFICATIONS FOR ROOF PENETRATIONS

1.01 General Surface Preparation-Requirements

- A. The E-Curb Liquid Applied Tie-in Flashing detail shall be installed on granulated APP, granulated SBS, existing gravel surfaced asphalt built-up roof systems, PVC, EPDM, and TPO Membranes.
- B. Do not install E-Curbs on wet surfaces. All dust, dirt, loose gravel or any other surface contaminants must be removed from the roof surface.

1.02 Roof Penetrations

- A. All mastics, coating, caulking, roof cement, scaled rust, loose paint, asphalt and any other contaminants shall be removed from the roof penetration with a wire brush. The prepared area on the roof penetration shall extend from the base a minimum of 3” above the roof line.

1.03 Penetration Base Seal

- A. M-1 Structural Sealant shall be applied around the base perimeter of the roof penetration in order to seal all gaps and voids. Additional M-1 shall be applied to the penetration and neatly troweled covering the entire circumference or outer perimeter of the roof penetration extending from the base up a minimum of 3” above the roof line. The M-1 sealant acts as a primer to enhance the adhesion of the CHEM LINK pourable sealers. Do not use roof cement for a temporary seal or asphalt primer to prime the roof penetrations. These products will act as bond-breaking agents and can negatively affect the pourable sealers due to their solvent content.

1.04 CHEM LINK Pourable Sealers

- A. Only CHEM LINK 1-Part Pourable Sealer and Pro Pack shall be used to fill E-Curbs. The entire curb shall be filled to the height of 2” with the pourable sealers. No grout, concrete, granules, gravel, insulation, or any other filler shall be used to in the E-Curb to take up volume.
- B. 1-Part Pourable Sealer does not require mixing and is not adversely affected by light rain immediately after installation. Light rain will cause the 1-Part to skin over very quickly forming a rubber-like waterproof skin. 1-Part should not be applied under 30° F (-1° C). The roof surface shall be dry during the installation process of the E-Curbs.
- C. Do not apply Pro Pack two-part urethane pourable sealant under 40° F (4° C) or if rain is expectant within four hours after the application time. Parts A & B must be mixed for a minimum of five minutes, until a uniform black color is obtained.

- D. DuraSil SL does not require mixing and can be installed where high temperatures up to 400° F (177° C) are required.

Part 2 - Material, Storage and Handling

- A. Examine all CHEM LINK packages and containers upon delivery to make sure they not damaged. Do not use any unlabeled products. Notify CHEM LINK Products, LLC. at (800) 826-1681 if any products are damaged or unlabeled.
- B. Store CHEM LINK sealants and adhesives in a cool, dry place. If stored in freezing conditions, they should be brought up to room temperature 24 hours before use. The shelf-life of the sealants and adhesive is one year from the batch date that is located on the containers.

2.01 E-Curbs and Accessories

- A. E-Curbs are a lighter weight version of a ChemCurb that are made of fiberglass reinforced nylon that features a slip-fit connection that provides for a faster installation. E-Curbs are only available in 3" i.d., 4" i.d., 6" i.d. and 9" i.d. two-piece round sections. All components are 2" high and are installed in the same manner as the standard ChemCurb.
- C. 3" i.d. E-Curbs are designed for small pipe penetrations or for single electrical conduits from A/C units, solar panels, surveillance cameras etc. E-Curbs are also commonly installed on metal roofs and copings. Note: Any E-Curb or ChemCurb that is installed on Kynar coated metal, must be bonded to the surface and filled with CHEM LINK DuraLink low modulus sealant or DuraSil silicone sealant. Do not use M-1 Structural Sealant.
- D. E-Curb 8" Straights are available in 8" lengths. These components are used to make larger, custom fitted E-Curbs. The half round sections can be snapped onto each end of a straight section to make larger oval shaped curbs that contain multiple roof penetrations.
- E. E-Curb 2" Corners are used in conjunction with the straight sections to make large rectangular E-Curbs. There is no maximum size limitation to a custom fit E-Curb. However, it is recommended to allow the M-1 Structural Sealant that is used to bond the curb sections together to cure for one hour to gain strength before filling the curb.

2.02 1-Part Pourable Sealer / Pro Pack

- A. 1-Part Pourable Sealer is a solvent free, self-leveling single component pourable sealer that cures from atmospheric moisture rather than moisture evaporation within the sealant. 1-Part eliminates mixing errors, labor and waste. Unused portions left in containers can be re-sealed and used again within a few days. The quart tubes of 1-Part can be sealed by inserting the cut off nozzle tip (point first), back into the tube. The half gallon pouches should have the air squeezed out before screwing the cap back in place. 1-Part Pourable Sealer is available in 10.1 oz. and 28 oz. cartridges and ½ gallon foil pouches that are complete with nozzles. 1-Part is odor free and is ideal for use on schools, hospitals, office buildings and food processing plants. 1-Part is extremely flexible and is recommended for use in E-Curbs that are subjected to vibration and excessive stress exerted from machinery screens.

- 1-Part is required for use in E-Curbs and ChemCurbs installed on granulated modified bitumen systems due to poor granule adhesion. 1-Part enhances the surface bond of the granules.
- B. 1-Part Pourable Sealer forms a watertight rubber-like skin within five minutes. Total curing times vary depending on ambient temperature and humidity, but ChemCurb remains 100% watertight until the sealer forms a solid block of rubber. Note: Do not disturb or poke at the bonds while 1-Part is curing. Bond strength continues to build during the curing process.
- C. Pro Pack must be mixed for a minimum for five minutes until a uniform black color is obtained. Do not apply Pro Pack two-part urethane pourable sealant if rain is expectant within four hours after the application time. Do not apply Pro Pack under 40° F (4° C).
- D. DuraSil SL is odor free and is ideal for use on schools, hospitals, office buildings and food processing plants where a high temperature sealer is required. DuraSil SL is extremely flexible and is recommended for use in DuraSil SL is required for use in E-Curbs and ChemCurbs installed on granulated modified bitumen systems due to poor granule adhesion. DuraSil SL enhances the surface bond of the granules.

Part 3 - Roof Surface Preparation

3.01 Granulated S.B.S. and A.P.P. Modified Bitumen

All dust, dirt, grease, water, ice and any other surface contaminants must be removed completely from the roof surface. The roof membrane substrate must be clean and dry. Do not install E-Curbs on smooth APP. Due to the "non-oily" surface of granulated modified bitumen membranes, E-Curbs can be applied directly to the granulated surface. Brush away any loose granules before installing the E-Curb. Note: Due to poor granule adhesion, 1-Part Pourable Sealant should be used exclusively to fill E-Curbs that are installed on all granulated membranes.

3.02 Existing Gravel Surfaced Asphalt and Coal Tar Built-Up Roofs

Spud the gravel smooth until the top ply felts are exposed if possible. If roof restaurants, coatings, roof cement or hot asphalt was applied to the roof surface around the roof penetration, all such materials must be removed by whatever means are necessary. Sweep away all dust, dirt and debris from the application area before installing the E-Curb. Do not use asphalt primer to prime the roof surface or the roof penetration.

3.03 Membrane Systems EPDM, PVC, TPO

Clean surrounding penetration area with membrane cleaner or isopropyl alcohol to ensure all dirt, dust and contaminations is removed from membrane.

NOTE: Prime TPO membrane with TPO Primer prior to installing the E-Curb System

NOTE: Do not use E-Curb System on Hypalon roofing membranes.

Part 4 - Application of the E-Curb

4.01 Application

- A. After the surface preparation on the roof penetrations has been completed, a bead of M-1 Structural Sealant shall be applied around the base of all penetrations that are inside the E-Curb. Apply additional M-1 to the penetrations, starting at the base and extending a minimum of 3" above the roof. Tool the M-1 smooth, covering the entire circumference of the penetration/s. The M-1 serves as a primer and enhances the bond of the pourable sealer to the surface of the roof penetration. Do not use roof cement for sealing the base of the penetrations. Do not use asphalt primer to prime the penetration.
- B. Hold the first section (or curved section) of the E-Curb "flat side up", and apply a ¼" bead of M-1 Structural Sealant to the bottom perimeter and another bead down the center of the curb section. Place the freshly treated section into place on the prepared surface, and press it down firmly. If the roof surface is not uniform (spudded gravel BUR), additional M-1 may be applied to obtain a proper bond to the roof surface.
- C. Apply M-1 to the second section (or succeeding straight and corner sections for large E-Curbs) as described in Section 3.01. Press the sections together and down firmly. Apply additional M-1 to any voids. Note: Always maintain a distance of 1" between penetrations and the inside edge of the E-Curb in order to obtain a proper seal.
- D. When the entire E-Curb is assembled and pressed into place, a bead of M-1 Structural Sealant shall be applied around the outside base of the ChemCurb. All joints and seams shall be tooled to a smooth finish with the applicator stick that is included with each E-Curb case. When installing E-Curbs on granulated membranes, some additional M-1 shall be applied to the granulated roof surface around the ChemCurb and tooled thin (1/2" wide) to lock in the roof granules.
E-Curbs should have a small amount of M-1 applied to the slip joint on the curb to prevent leakage of the pourable sealer.
- E. Fill the entire E-Curb with either 1-Part Pourable Sealer or Pro Pack. As per the mixing instructions on the CHEM LINK Pro Pack, mix parts "A" and "B" for a minimum of 5 minutes, until they become a uniform solid black color. Pour the pourable sealer into the E-Curb until it is completely flush with the top of the E-Curb.

4.02 Roof with Multiple E-Curbs

On a roof that has many E-Curbs to be installed, it can be faster to install the sections of several E-Curbs and then fill them all at once. This can help reduce the possibility of having unused Pro Pack or 1-Part Pourable Sealer left in a container. Make sure all temporary seals around the roof penetrations were sealed with M-1 Structural Sealant. Do not use roof cement for temporary seals.

4.03 **Multiple Large E-Curbs**

It is recommended to assemble large rectangular E-Curbs and allow the M-1 to cure for at least ½ hour before filling with 1-Part or Pro Pack. This gives the M-1 time to gain strength on the bonded curb sections in order to accommodate the hydrostatic pressure of multiple gallons of pourable sealer.

Note: If the penetration is for a hot pipe the entire E-Curb installation procedure should be completed using only the DuraSil and DuraSil SL. The surface of the metal must be cleaned with a clean rag and denatured alcohol prior to installation. Seal the pipe penetration and bond the E-curb with DuraSil and fill the penetration with DuraSil SL in the place of M-1 and 1-Part.

4.04 **Positive Slope Installation**

It is imperative to maintain the 2" depth of the sealer inside the entire E-Curb on steep slope roofs. This can be accomplished by filling the entire E-Curb (while packing the sealant tightly with a trowel), with CHEM LINK's low modulus DuraLink sealant. Hand tool the DuraLink to a smooth finish, flush with the top of the E-Curb.

The base of the roof penetration shall still be sealed with M-1 Structural Sealant and the vertical portion of the penetration shall be primed with M-1 Structural Sealant after normal surface preparations are completed.

Note: If the roof is a Kynar coated metal roof, the entire E-Curb installation procedure should be completed using only the DuraLink or DuraSil sealant. The surface of the metal must be cleaned with a clean rag and denatured alcohol prior to installation.

Part 5 - Existing Roof Warranties

When installing E-Curbs on an existing roof, it is necessary to determine if there is a contractor or manufacturer's warranty in force on the roof. Installing an E-Curb without prior authorization from the building owner, contractor, or roofing manufacturer, may void any warranties that have been issued on the roof area. Proper authorization is required prior to the installation of E-Curbs on all existing roof systems.

Part 6 - Extended Limited Materials Warranty

Upon receiving the completed warranty card and when applied in accordance with the CHEM LINK Products, LLC application instructions using only CHEM LINK Product, LLC materials, CHEM LINK Products, LLC warrants its E-Curb System for up to 20 years from the date of installation against leaks.

Our liability under this warranty, and buyer's sole and exclusive remedy, will be to provide Chem Link replacement product free of charge. CHEM LINK Products, LLC shall not be liable for: cost of labor to apply the product; damage to roofing, other structures, or interior contents of buildings; or for any other damages, whether direct, incidental, or consequential.

This warranty is in lieu of all other warranties, expressed and implied, including the warranties of merchantability and fitness for a particular purpose and warranties in tort. CHEM LINK



Products, LLC also disclaims any liability under any non-warranty theory of liability, including, but not limited to contractual, tort, or liability. Neither the scope of the warranty nor liability the warranty may be extended except in writing executed by a duly elected officer of CHEM LINK Products, LLC of Schoolcraft, Michigan.

Part 7 - Policies

CHEM LINK Products, LLC reserves the right to change or modify, at its discretion, and without prior notice, any of the specifications, requirements, or information in the preceding text. This revision of 5/11/12 supersedes all literature, catalogs and previous manuals.

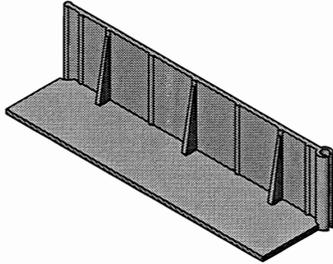
CHEM LINK Products, LLC, as a manufacturer, is not involved in the design or construction of buildings or structures. CHEM LINK Products, LLC will not accept responsibility for the performance of its products when damage is caused by, construction faults, defects in workmanship, improper building design, including but not limited to, excessive expansion or defective structural decking. CHEM LINK Products, LLC is also not responsible for any interior damages caused by water leakage into the building.

The design responsibility remains with the consultant, engineer, architect, contractor, or building owner. The guidelines described herein are solely for guidance purposes. These guidelines should not be considered to be all-inclusive.

END OF SECTION

E-CURB System

The **E-CURB** penetration pieces consist of the following sizes and colors:



E-CURB Straights

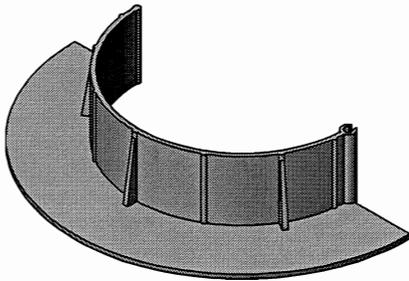
8" Straight sections used to lengthen the **E-Curb**
F1356WH (White) & F1356GR (Gray)
-contains 16 pieces per carton.

E-CURB Corners

2" corner pieces used with straight sections
to make box shapes
F1355WH (White) & F1355GR (Gray)
-contains 16 pieces per carton.



E-CURB Diameter Rounds



3" diameter round consisting of (2) 1.5" radius pcs
F1331 gray only complete 1-Part & M-1 Kit
-contains 10 complete curbs per carton.
F1333 gray components only
-contains 24 curbs only per carton.

4" diameter round consisting of (2) 2.0" radius pcs
F1354WH & F1354GR complete 1-Part & M-1 Kit
-contains 4 complete curbs per carton.
F1357WH & F1357GR components only
-contains 12 curbs only per carton.

6" diameter round consisting of (2) 3.0" radius pcs
F1350WH & F1350GR complete 1-Part & M-1 Kit
-contains 3 complete curbs per carton.
F1352WH & F1352GR components only
-contains 6 curbs only per carton.

9" diameter round consisting of (2) 4.5" radius pcs
F1351WH & F1351GR complete 1-Part & M-1 Kit
-contains 3 complete curbs per carton.
F1353WH & F1353GR components only
-contains 5 curbs only per carton.

HOW TO CALCULATE E-CURB VOLUMES

Note: These figures represent volume of sealant needed for various sizes of curb combinations **without displacement for penetrations.** (To estimate exact volume needed, also figure volume of penetrations and subtract from volume of curbs.)

To figure volume of a square curb: multiply length x width x depth, (2") x (quantity of curbs needed) then divide by 231 (cu. inches in a gal.) to get the number of gallons needed to fill the curb.

Note:

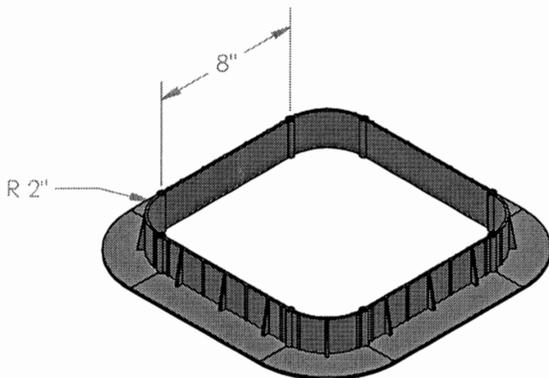
- One gal. pourable sealer = 231 cu. in.
- One 1/2 gal. pouch = 115.5 cu. in.
- One 28 oz cartridge = 50 cu. in.
- One 10.1 oz cartridge = 4.18 cu. in.

Always figure 2" depth for E-Curbs. Less invalidates warranty. A Corner Curb adds two inches to a Straight Curb on each end.

Examples:

Four 8" Straights + Four 2" Corners

Form a square 12" x 12" x 2" deep.
 Multiply 12" x 12" x 2" = 288 cu. in.
 Div. 288 cu. in. by 231 to = 1.25 gal.



3.0" round Curb + two 8.0" Straights

Form an oval 11" x 3" x 2" deep.
 Multiply 11" x 3" x 2" = 66 cu. in.
 Div. 66 cu. in. by 231 to = .30 gal.

4.0" round Curb + two 8.0" Straights

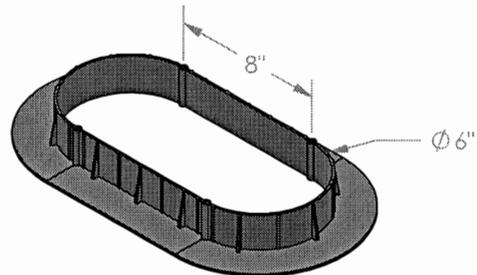
Form an oval 12" x 4" x 2" deep.
 Multiply 12" x 4" x 2" = 96 cu. in.
 Div. 96 cu. in. by 231 to = .42 gal.

6.0" round Curb + two 8.0" Straights

Form an oval 14" x 6" x 2" deep.
 Multiply 14" x 6" x 2" = 168 cu. in.
 Div. 168 cu. in. by 231 to = .73 gal.

9.0" round Curb + two 8.0" Straights

Form an oval 17" x 9" x 2" deep.
 Multiply 17" x 9" x 2" = 306 cu. in.
 Div. 306 cu. in. by 231 to = 1.32 gal.



To figure volume of a round curb: multiply (radius squared x 3.14 x depth) x (quantity of curbs needed) then divide by 231 (cu. in. in a gallon) to get the number of gallons needed to fill the curb.

3.0" round Curb

Form a diameter 3" x 2" deep.
 Multiply 1.5" squared x 3.14 x 2" = 14.13 cu. in.
 Div. 14.13 cu. in. by 231 to = .06 gal.

4.0" round Curb

Form a diameter 4" x 2" deep.
 Multiply 2" squared x 3.14 x 2" = 25.12 cu. in.
 Div. 25.12 cu. in. by 231 to = .11 gal.

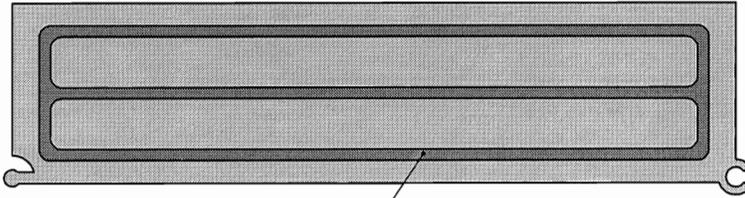
6.0" round Curb

Form a diameter 6" x 2" deep.
 Multiply 3" squared x 3.14 x 2" = 57.52 cu. in.
 Div. 57.52 cu. in. by 231 to = .25 gal.

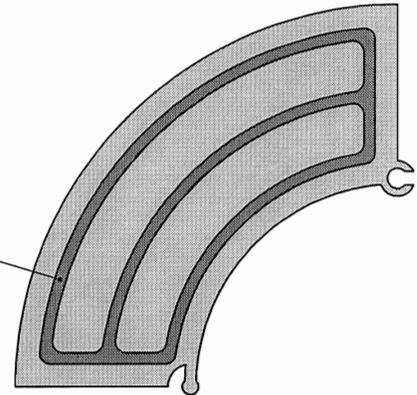
9.0" round Curb

Form a diameter 9" x 2" deep.
 Multiply 4.5" squared x 3.14 x 2" = 127.17 cu. in.
 Div. 127.17 cu. in. by 231 to = .55 gal.

M-1 APPLICATION TO THE BOTTOM OF THE E-CURB SECTIONS

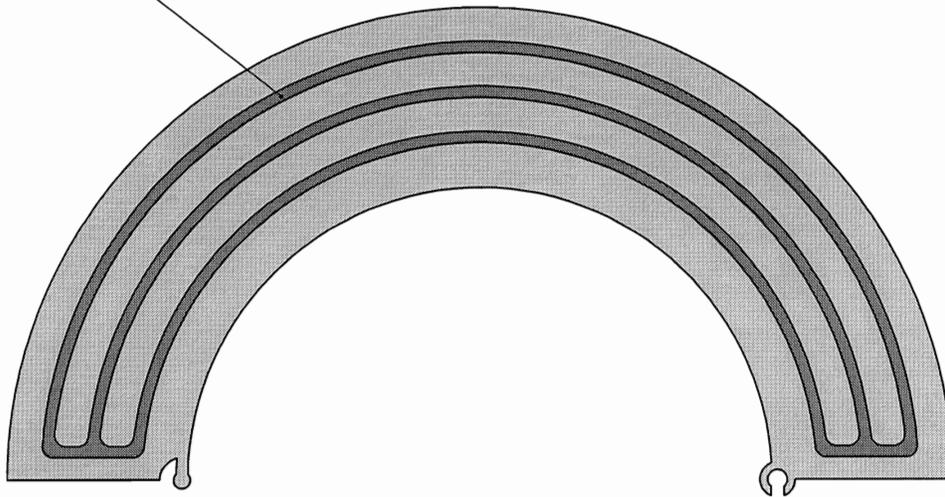


Apply 1/4" diameter beads of M-1 as shown, to the bottom of each E-Curb section.
DO NOT TOOL THE M-1 BEADS SMOOTH!

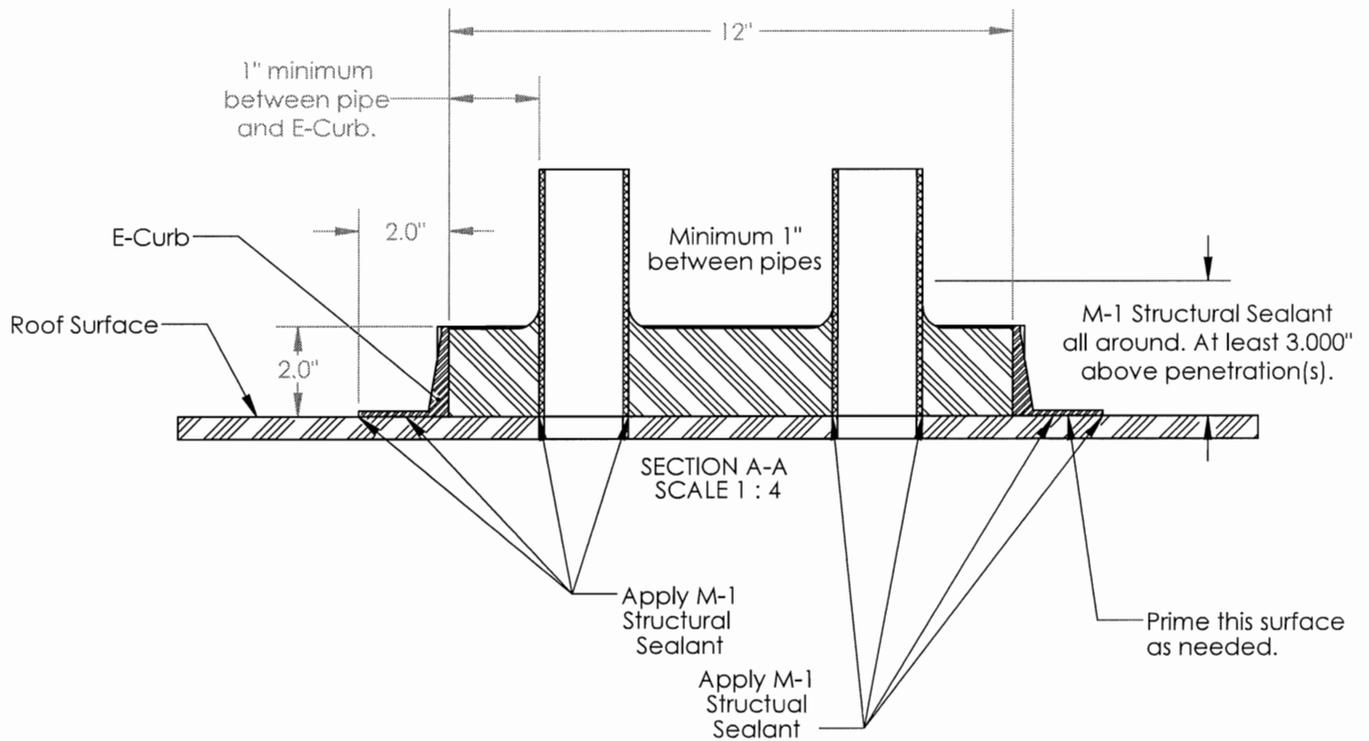
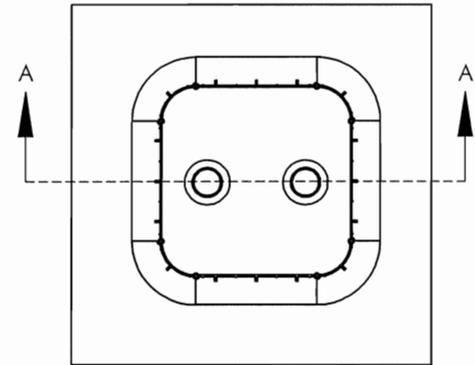


Apply 1/4" diameter beads of M-1 as shown, to the bottom of each E-Curb section.
DO NOT TOOL THE M-1 BEADS SMOOTH!

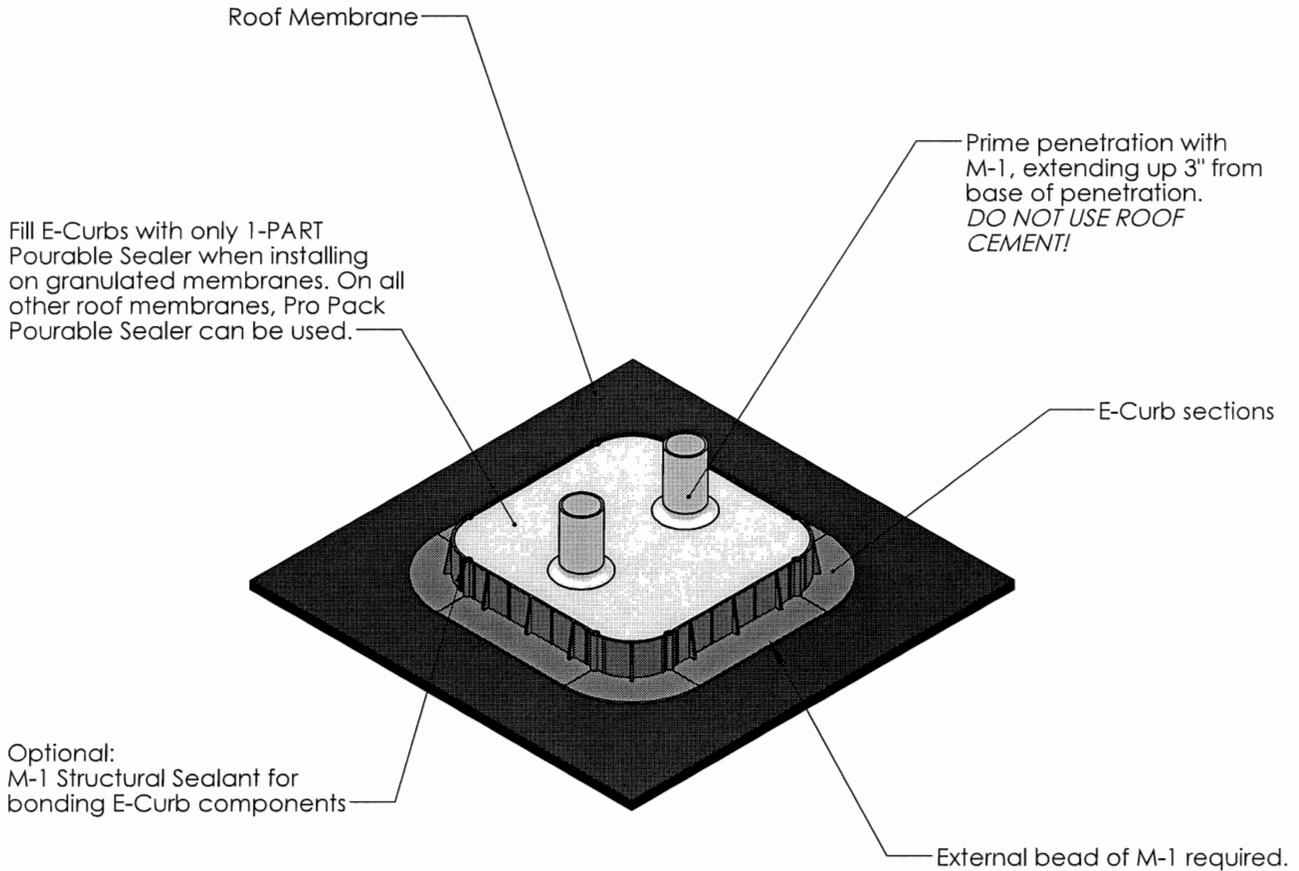
Apply 1/4" diameter beads of M-1 as shown, to the bottom of each E-Curb section.
DO NOT TOOL THE M-1 BEADS SMOOTH!



SECTION VIEW

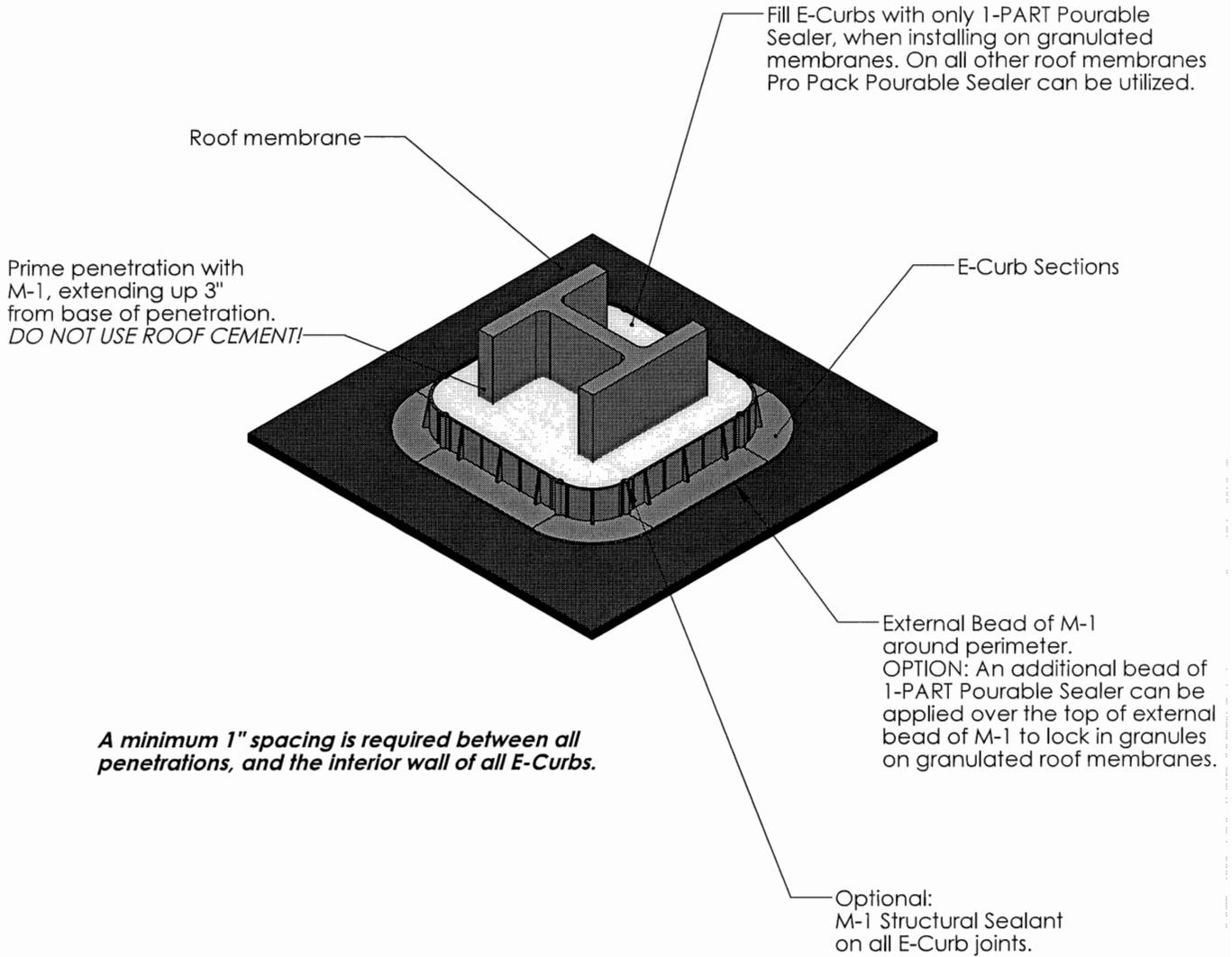


Standard E-Curb Detail

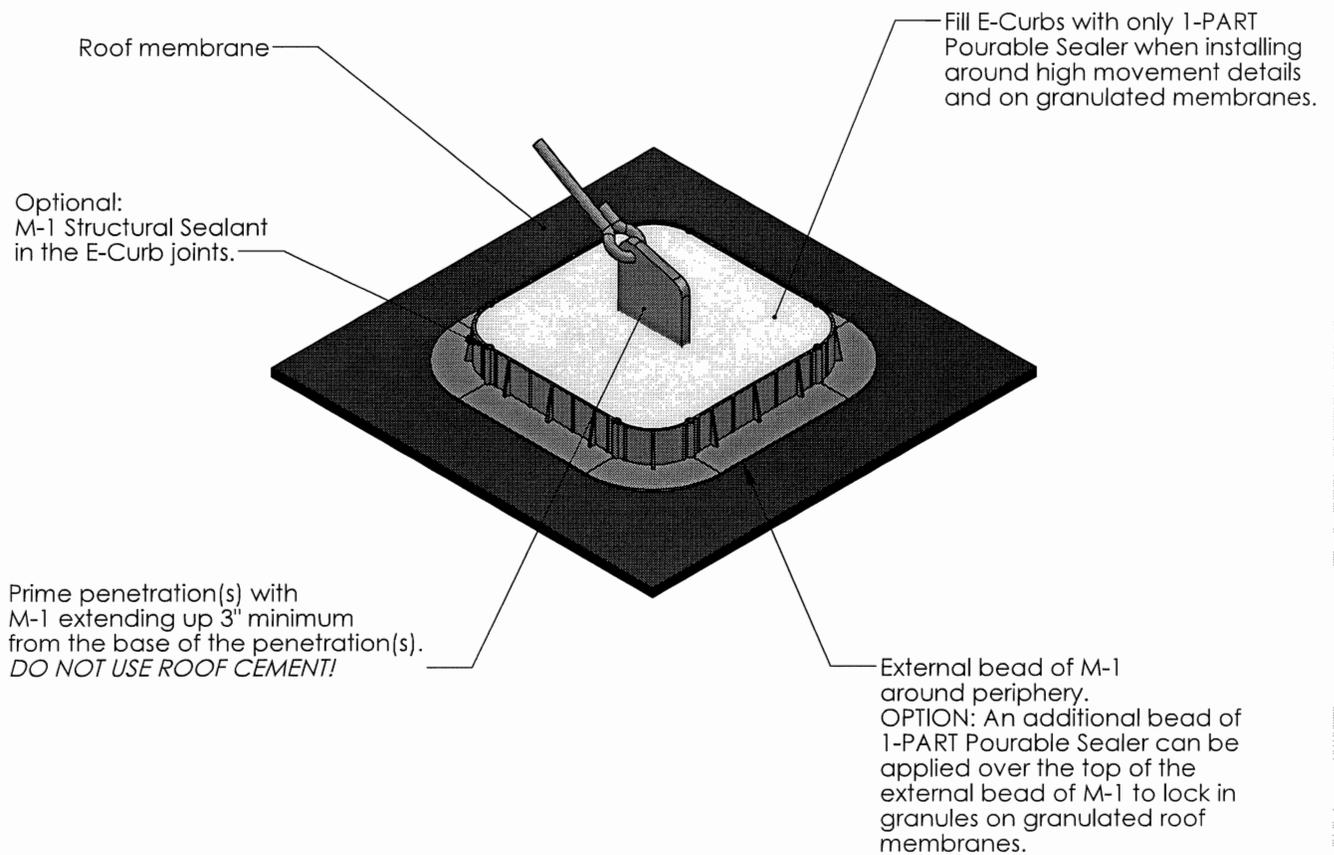


A minimum 1" space is required between all penetrations and the interior wall of all E-Curbs.

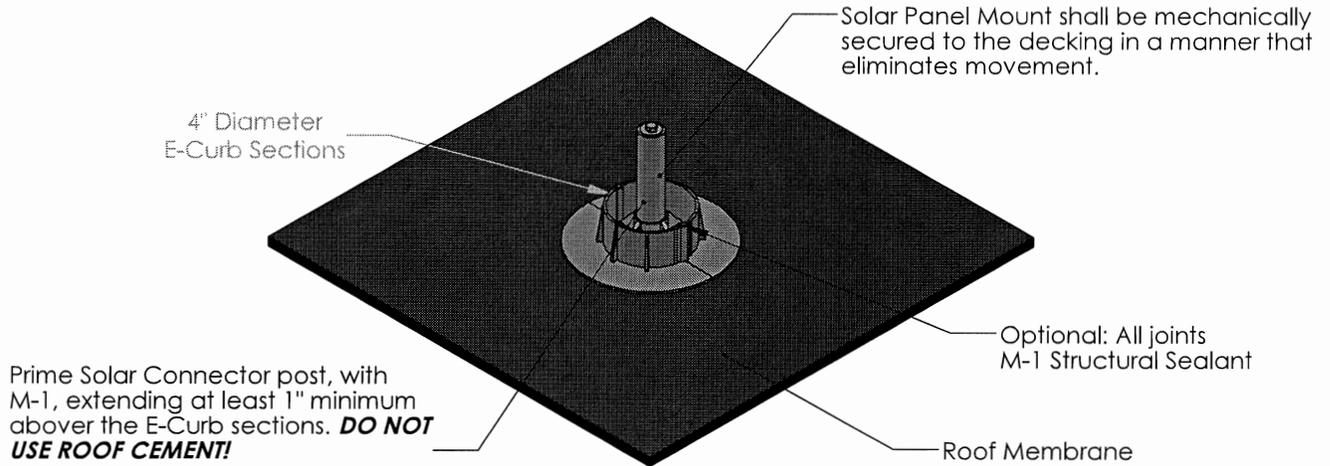
H-Beam Penetration



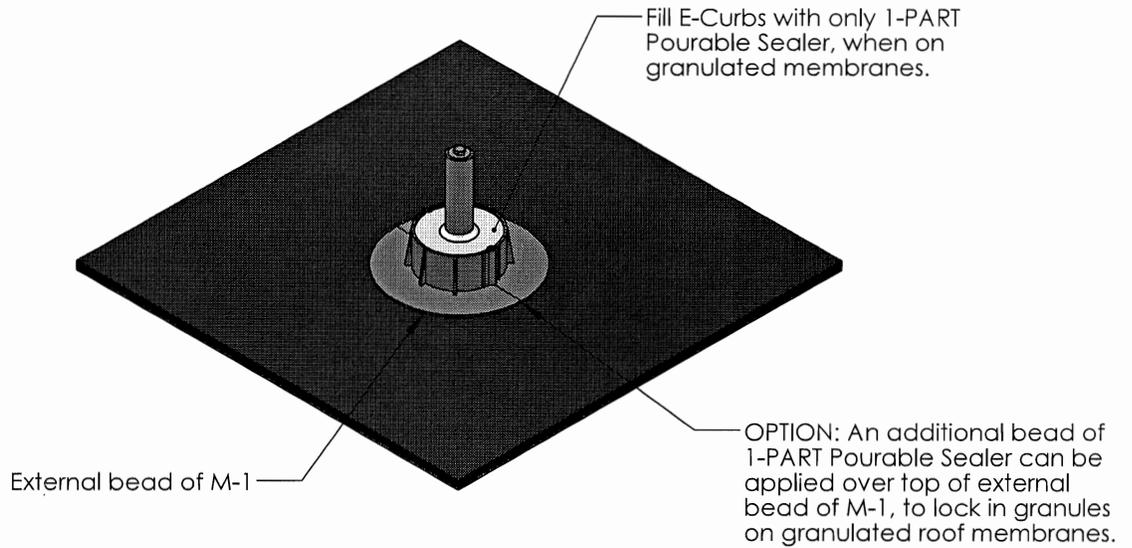
Cable Support Penetration



SOLAR PANEL MOUNT



A minimum 1" space is required between all penetrations and the interior wall of all E-Curbs.



MACHINERY SCREEN

Angle iron or support members shall be fabricated out of structural steel that is secured to the structural supports or decking in a manner that reduces structural movement as much as possible.

Fill E-Curbs with only 1-PART Pourable Sealer when installing around high movement details and on granulated membranes.

Prime penetrations with M-1, extending up 3" from the base of the penetration. **DO NOT USE ROOF CEMENT!**

E-Curb Sections

Optional: Apply M-1 Structural Sealant around all E-Curb joints.

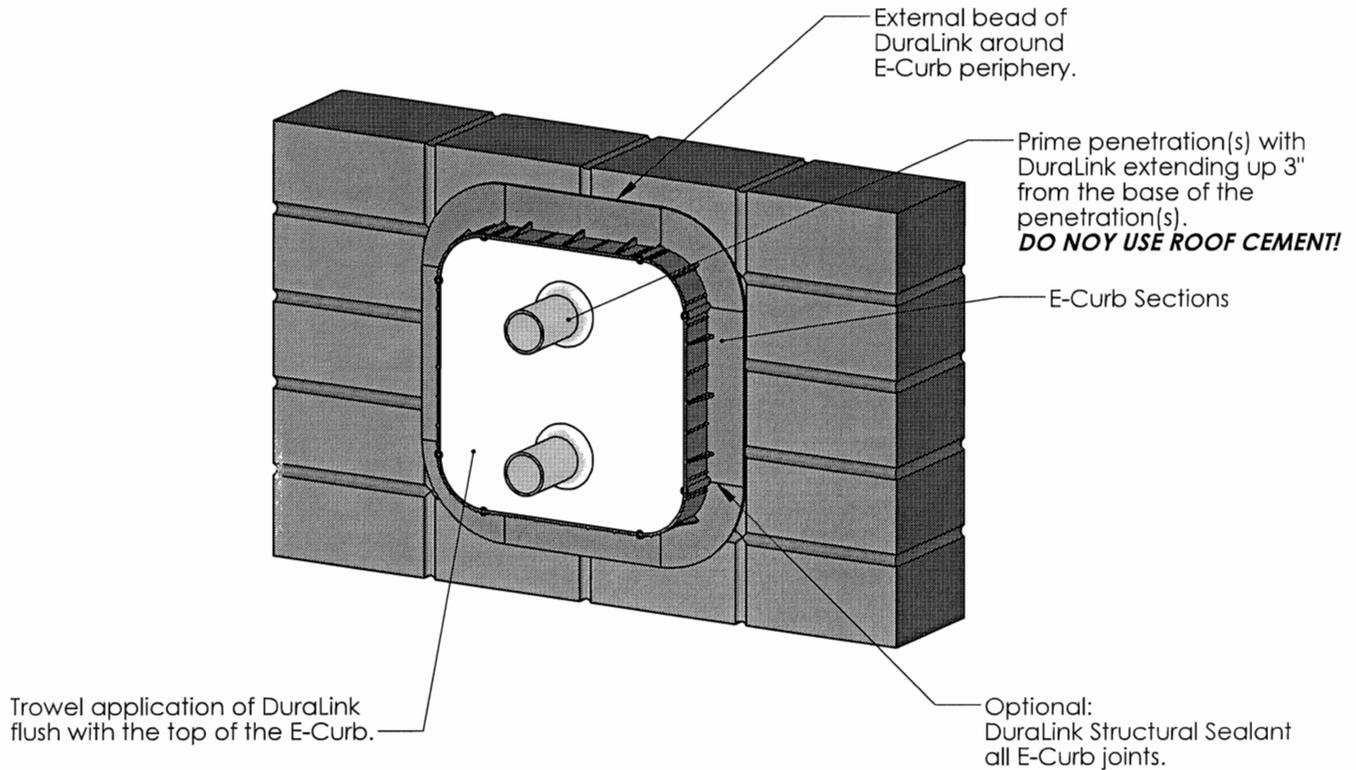
External bead of M-1 around E-Curb perimeter.

OPTION: An additional bead of 1-PART Pourable Sealer can be applied over top of external bead of M-1 to lock in granules on granulated roof membranes.

Roof Membrane

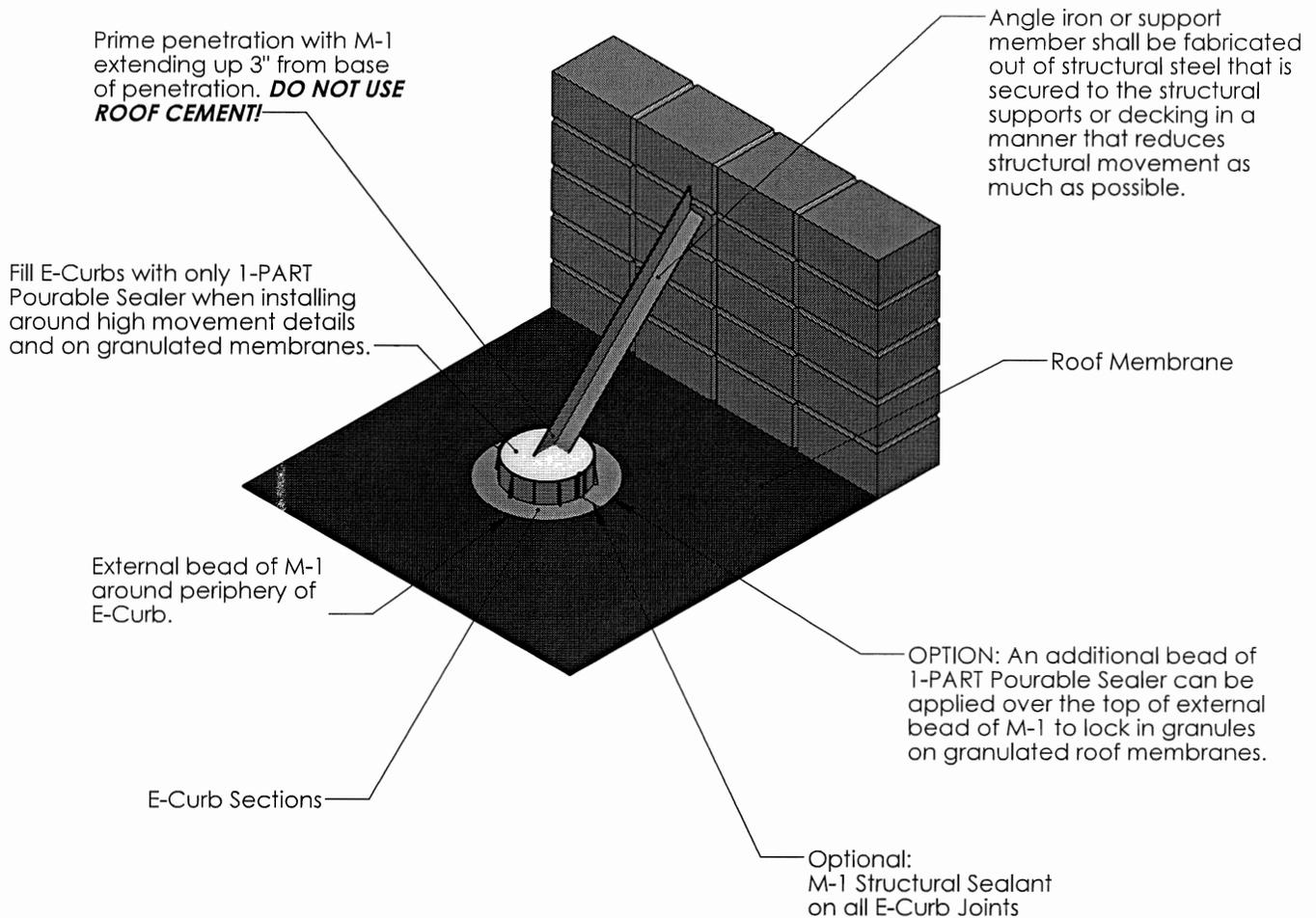
A minimum of 1" space is required between all penetrations and the interior wall of all E-Curbs.

VERTICAL WALL PENETRATIONS



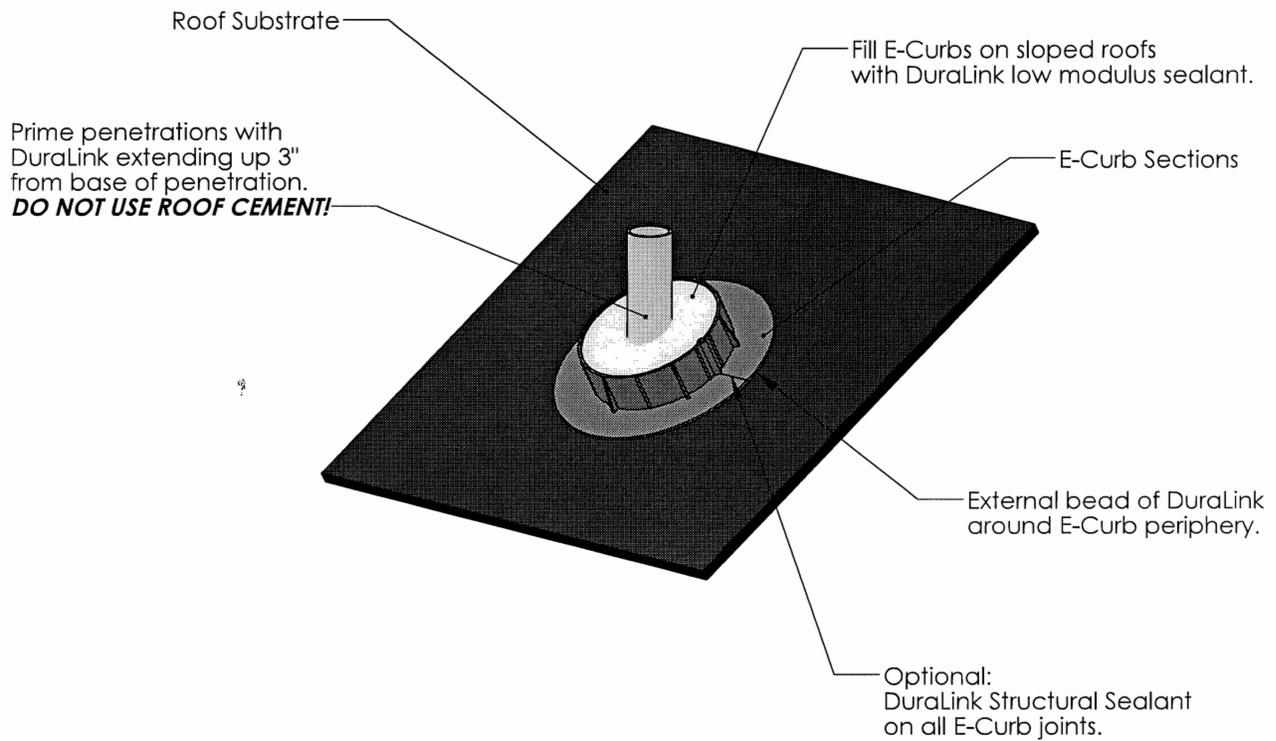
A minimum 1" space is required between all penetrations and the interior wall of all E-Curbs.

ANGLE IRON PENETRATION



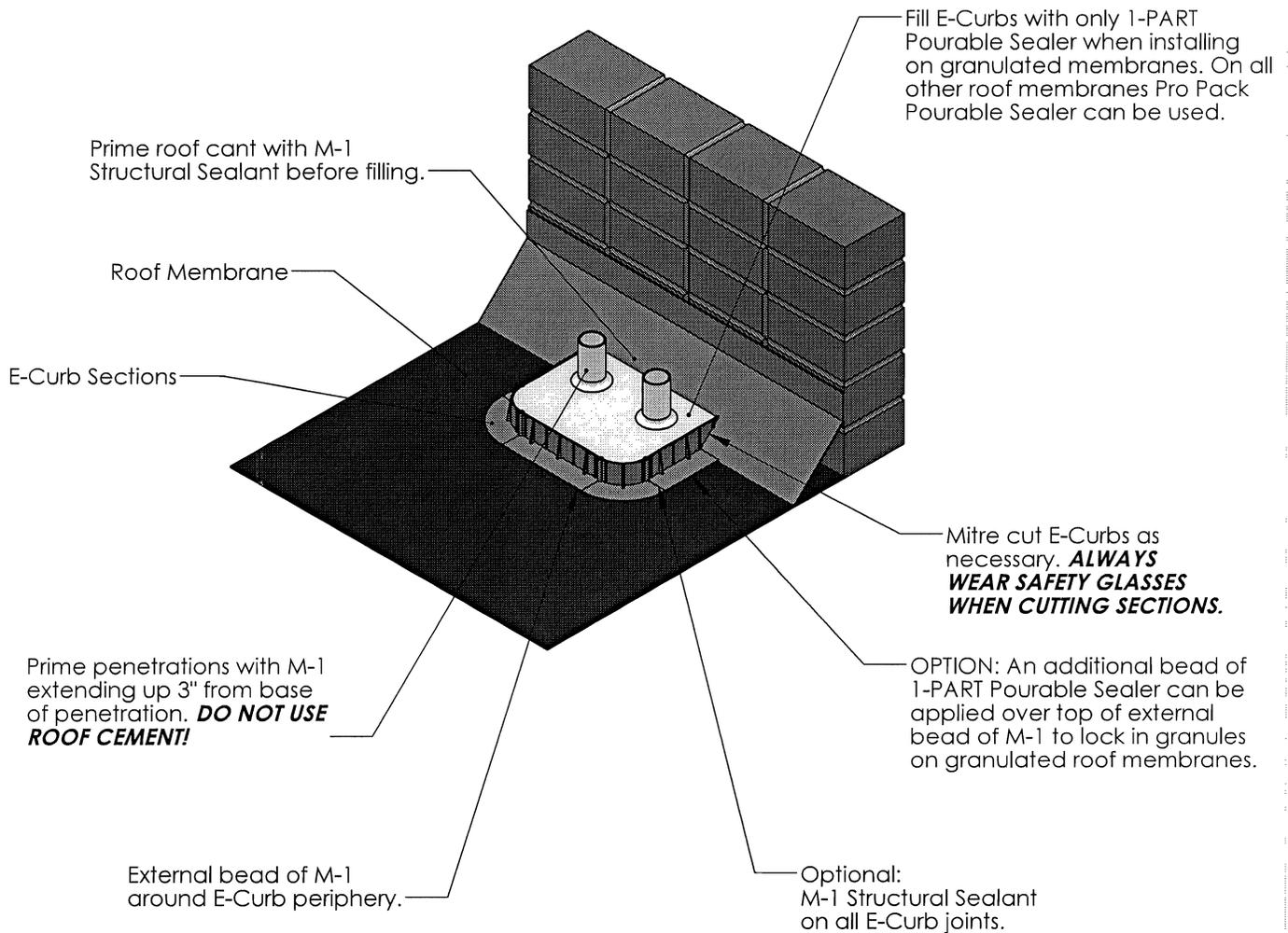
A minimum 1" space is required between all penetrations and the interior wall of all E-Curbs.

SLOPED ROOF PENETRATIONS



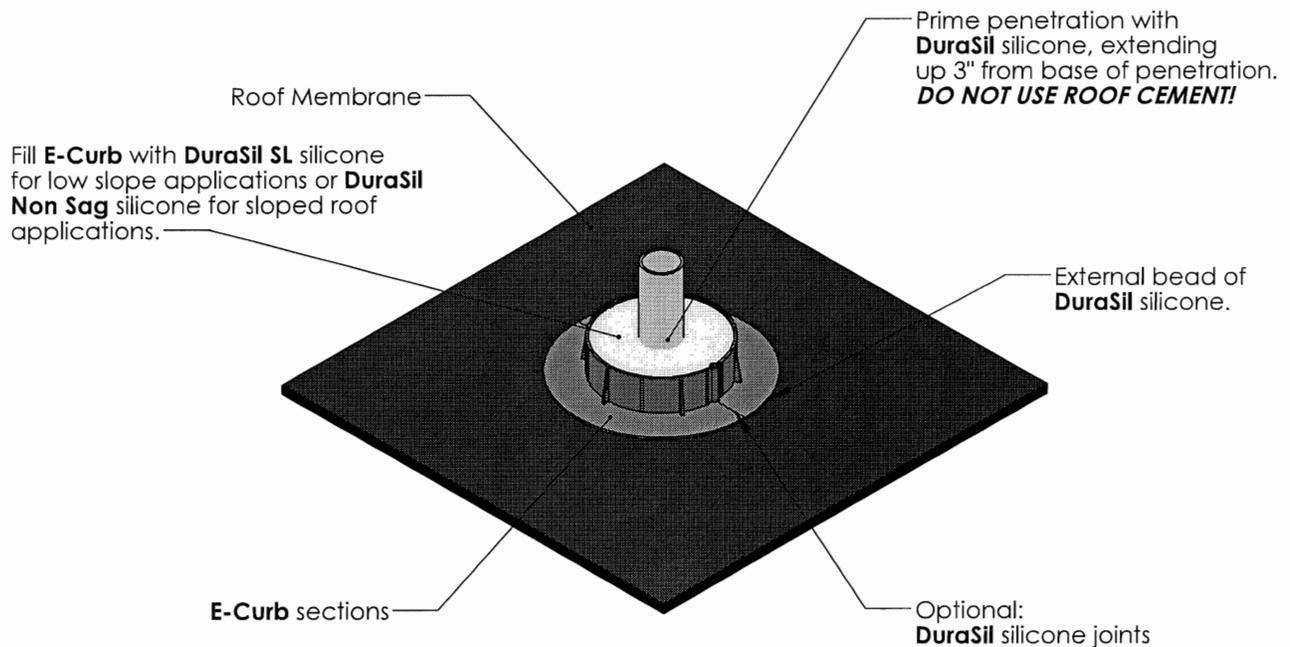
A minimum 1" space is required between all penetrations and the interior wall of all E-Curbs.

PENETRATION NEAR WALL FLASHING



A minimum 1" space is required between all penetrations and the interior wall of all E-Curbs.

HOT STACK PENETRATION (200° F to 400° F)

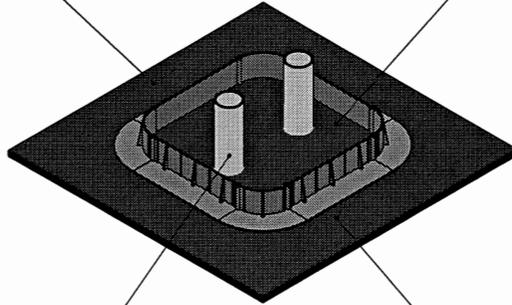


A minimum 1" space is required between all penetrations and the interior wall of all E-Curbs.

TPO MEMBRANE

TPO roof membrane.

Allow TPO primer to dry before installing the E-Curb.

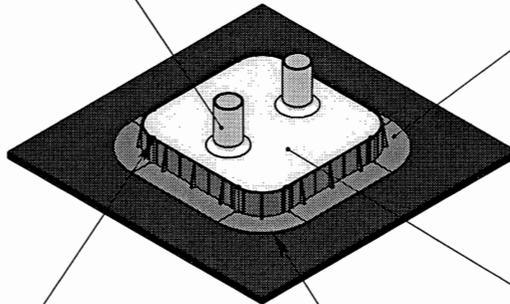


Prime penetration(s) with M-1, extending 3" up from the base of the penetration. **DO NOT USE ROOF CEMENT!**

Apply CHEMLINK TPO Primer with a brush to the surface of the TPO membrane. Primer shall extend from the base of the penetration(s) to 1" beyond the outside perimeter of the E-Curb.

Prime penetration(s) with M-1 extending 3" up from base of penetration(s). **DO NOT USE FROM ROOF CEMENT!**

E-Curb sections



Optional: M-1 Structural Sealant at all E-Curb joints.

Fill E-Curbs with 1-PART Pourable Sealer or Pro Pack.

External bead of M-1 around perimeter.

